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CONNECTIONIST THEORIES AND THE COGNITIVE DISCURSIVE APPROACH: FORMALISM VS. PHENOMENOLOGISM

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Abstract

The article discusses the possibility of contamination of cognitive linguistics with connectionist theories of formal algorithmization. The combination of formalism and phenomenologism in the creation of sustainable models for analyzing the mechanisms of objectifying the content of a verbal utterance at the moment represents very broad possibilities. The authors present the process of generation and interpretation as a systematic connection of complex network structures, namely, as a general algorithm for transferring some code elements to other code systems. Within the framework of a complex model, the rules of representation of verbal categories acquire the universal status of phrasal projections, which makes it possible to analyze both stereotypical forms of objectification and complex non-conventional derivative complexes. The principles and parameters of the formal algorithmization and variational phenomenologization are parallel in the case when a stereotypical pattern of activity («action scheme») is present in the information presentation slots. . The network connection of a modified type is determined on the basis of the criteria for the valeral status of the components of the utterance in the system of stereotypical samples; moreover, certain structures that do not correspond to them are leveled in the event of an unformed decoration. The formation of « action scheme » is not considered as a situation confirming the prediction of a sequence of elements, but is an overview of the compatibility of various categories.

Keywords: Objectification content**,** Earley algorithm, single hierarchical network, philological phenomenological hermeneutics, formalization, information processing.

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1. Introduction

Cognitive Linguistics aims to describe language as a cognitive phenomenon. There is no consensus on how to solve this problem. In accordance with the classical point of view, cognitive abilities, especially the processing of speech, are described as character processing systems. There is no need to provide the structural properties of the implementation; its explanation will not contribute to the characterization of cognitive mechanisms. Within the framework of the concepts of artificial intelligence, it is customary to assume that the proportion of cognitive and physical description corresponds to the ratio of software and hardware. Simple algebraic algorithms are used to determine the conditions of rule regularity. The specific implementation is completely at the mercy of the program code. The degree of reliability of the argument is determined by the concept of automatic sequences of J. von Neumann (Aspray, 1990) as the basic principle of modeling; however, it is certainly assumed that parallel and effective implementation options can serve as the basis for the transformation of the symbolic concept of implementation.

The main critics of the current state of the cognitive approach are radical connectionists. In their opinion, cognitive processes are the processes of verbalization, the internal structure of which is determined by external influences, while the adaptation processes of objectification / disobjectification content are controlled exclusively by universal and non-specific principles. In this respect, the position of radical connectionists is comparable with statistical methods of behaviorists. They go beyond the formal description and claim that the ability to objectify deep structures in the material space lies in the adaptability of individual compounds of simple interactive units (neurons). From a cognitive point of view, taking into account the complexity of the generated network hierarchical structures (that is, structures of network connections), it should be expected that the analysis should be reduced to describing the processing of symbols in their combinations (each element of any cognitive space has potential valency only in the third level abstraction system) (Alikaev & Bredikhin, 2015). The cognitive functions of defining formal structures are thus not understood symbolically and analytically; they represent only the result of verbalization based on external influences.

2. Problem Statement

The questions of the dependence of the objectification / disobjectification distribution processes on the introduction of parallel systems, the adoption of their hierarchical organization a priori or a posteriori, that is, the postulation of the immanent prerequisite or the variable, permanent formation of parallel systems, remain still open. We believe that the duality of such an existence will eventually lead to adjustments and modifications to today's traditional structural descriptions.

Since connectionism determines the cognitive performance of the system in terms of its formal structure - according to the criteria of loading and stability of networking - it is important to identify, first of all, the existence of such a network system. The performance of symbol processing in connectionist terms involving philological phenomenological hermeneutics (Alikaev & Bredikhin, 2016) can be presented in a systematic connection of complex network structures, namely as a general algorithm of transparency of some code elements to other code systems, in accordance with which it is possible to build an inter-network translator . In other words, the relationship of implementation between different cognitive components (processing of symbols, creation of network structures and the formation of objectification /

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disobjectification meta-units) are predictable. This integrated approach can be followed by J. Fodor and Z. Pylishin and can be called the «implementing connectionism» (Fodor, & Pylyshin , 1988).

The ultimate goal of cognitive and connectionist research is to develop a universal system of disobjectification. Primary implementation becomes the initial structure for the formation of «action schemes» (Bogin, 2001), which are organically integrated into the process of understanding (for example, the implementation of parametrized principles and attitudes). This initial structure should also allow for the possibility that para- and extralinguistic factors (prosodica, kinesics, mimicry, horizontal and vertical contexts) can influence the further development of the structure (for example, by accurately determining the positions of parameters as strong links in the network).

This task currently seems to be insoluble from the standpoint of both radical connectionism and classical cognitive linguistics. Its solution can be based, at least on principles for implementation purposes of analysis potency decoding on the basis of criteria variation and binding formal representation.

3. Research Questions

Instead of working with legal phrasal structures in analysing the possibilities of content objectification / disobjectification, artificially narrowing the empirical material and selecting only suitable models, one should develop a system of linguistically motivated variable non-stereotypical models.

While simple connectionist network vectors of the primary system are motivated solely by algorithmic models describing the process of surface character processing, the complex system should be determined by the statement of declaratively interpreted constraints within the framework of the principles and parameters of the philological phenomenological hermeneutics. Thus, the constraints will be the constants of sense-generation.

4. Purpose of the Study

Taking into account the main aspects of algorithmization of objectification / disobjectification within the context of implementing connectionism, as well as the latest developments in cognitive linguistics (the provisions of philological phenomenological hermeneutics), we can see the development of an implementing algorithm and an implementing translator for any structural components of sense-generation and interpretation. The structure of implementing formal process under similar conditions must comply with Earley algorithm and a description can be built in terms of cognitive discourse analysis, which will subsequently remain within namely linguistic approach.

5. Research Methods

Instead of separating the procedural factors and cognitive mechanisms, to which the procedural factors are constantly turning, the connectionist hierarchical system consists only of closely related elements. Individual components perform only one specific system function - they have a certain potential. There is no« single controller»; a general «action scheme» for objectification / disobjectification is not formed.

Each of the types of objectified information that is constantly contained in the hierarchical network can be completely described by the activity state of each element, thus, objectification / disobjectification

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is expressed through the position, activity patterns of all slots. The transparency of code elements in separate positions is completely under the control of network connections: each element changes its position depending on the positions of the other components with which it is associated (Geert & Feyaerts, 2004). The network connection of two elements always goes through the procedure of reflexive verification and valerization, which determine the interaction of two or more components. Changing the position of the elements in the system takes place in parallel.

An any connectionist system should be designed in such a way that a) all objectified information can be presented in possible patterns of activity, and b) the distribution process can be performed using the network communication in the most appropriate way. Both of these tasks are difficult to accomplish in their nature without the construction of general «action scheme». At this stage, constants of sense-generation should be introduced within the framework of philological phenomenological hermeneutics.

Especially highly developed and highly structured models seem to us to be the most adequate both for presenting information and processing the results in terms of both objective and reflexive verification. Some of the formal algorithms have already tried to combine variable nonlinearity with dynamic programming methods, for example, the Earley algorithm (Earley, 1970).

6. Findings

For objectification / disobjectification of relevant information in the connectionist system, it is necessary to observe the strict formalism of transposing implementation components, regardless of the code system. Such presentation allows for the connectionist realization of the following advantages:

A. Quantitative characteristics with variable values can be interpreted directly as slots representing content components.
B. Principles and parameters can be interpreted as limitations of possible values in specific characteristics, and the entire host of principles and parameters represents the framework of the system model of information representation (Giora, 2003).
C. It is possible to analyze stereotypical patterns of slot activity in linguistic terms, i.e. stereotypical patterns and «action scheme» should be understood as one-to-one correspondences. Conversely, cognitive-discursive analysis of verbalizers can be transferred to the formal analysis plane (based on patterns of system activity.

Apart from these considerations, it is important for us is that the basic elements of an algorithmic process that we have developed for use of Earley algorithms to analyze not only syntax but also semantic, noematic structures can be applied to any cognitive system, without destroying neither their formal structure, no phenomenological variability.

This basic procedure is modified in such a way that instead of coding rules for linguistic categories, for example, NP, VP, ... , phrasal projections are used, for example, N0, N1, N2. This means that we have to deviate from the approach of local and linear information representation: instead of objectifying one of the components of the trichotomic element of a particular slot, it is now necessary to represent categories distributed in paradigmatic space. Each category, therefore, includes all the functions that are necessary

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and sufficient to fully describe the entire category. When determining the valerity in the system and comparing each of the slot functions that are being updated, a general category is formed, which will be an example of activity using the corresponding slots.

To use the already developed algorithms in the analysis, i.e. to established «action scheme» in disobjectification sense, each of the sum available slots should represent one of the categories of criteria characteristics explicable. This can be achieved only if each category is represented in an activity sample under a fixed finite number of slots, and also with the condition that different activity patterns of two different categories do not use the same slot in parallel (Herbst, 2018, p. 318), i.e. under conditions of amphibolicity , the presentation of a formalized algorithm is impossible.

In the framework of this methodological study, we want to demonstrate the following four provisions that are realized with the organic combination of formalized and phenomenological approaches in the analysis of both syntactic and semantic structures:

1. The principles and parameters of the network hierarchical system are amenable to analysis based on the description of the criterion indicators of individual information presentation slots, which in a minimal format immanently contain character characteristics of the system as a whole.
2. Selected to describe the patterns of activity can be explained on the basis of the Earley algorithm, supplemented by variables of noematic compatibility, together with meta-units, representing a system of paradigmatic relations in a parameterized basis of the phrase.
3. The principles and parameters for generating the compatibility of individual components can thus be expressed using a network of individual slots (Kurata, Xiang & Zhou, 2016).

However, it should be noted that in each individual case, it is necessary to develop adequate models for changing code parameters «action scheme» and translate them into appropriate formal algorithms for automated analysis. Naturally, there is a need for parallel implementation of the principles and parameters of formalization and phenomenologization in the case of presence of implicit activity patterns in individual slots. The modified type of network connection is determined to be used in non-custom algorithms, when activity patterns contrast with stereotyped models and are not taken into account when determining network parameters of a generalized structure or in the case of derivational transformations.

With the introduction of elements of cognitive-discursive analysis into the connectionist system, new possibilities are opened for describing the calculated number of actualized functions not only in stereotypical, but also in variable slots. Within the framework of applying a contaminated model, instead of a consistent linear comparison of each of the elements of the trichotomic structure, there is a simultaneous comparison of complexly organized unity with all components of the system, an analysis of paradigmatic relations.

For a complex model, the assimilation of the «action scheme» is no longer interpreted as a complete implementation of the predictive strategy, but it seems simply as a variable set of compatibility criteria for different implemented categories. If the «action scheme» acquires the status of actual and learned, i.e. can be used as a clear algorithm for objectification / disobjectification variable constructions with different content (Clark & Bangerter, 2004), the presence of a modified network connection is verified by the

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presence of the transformation itself and by combining elements of two or more categories based on a free associative experiment. If there are overlapping areas (contaminated slots), the results of contamination (new elements modifying the overall structure) are added to the activity pattern.

Each of the complex network links reflects an actual analyzer, so that the described slots are in the control space acting as a model for the Earley algorithm. The axis of contamination in this system should be understood differently, while each of the analyzed slots in the process of objectification/ disobjectification in the pure Earley algorithm is represented on the axis of formal analysis, for us the individual contamination slots represent only the formalization index, i.e. individual slots do not work anymore, and only groups of slots make up the general schedule.

As a formula, this complex algorithm for analyzing activity samples can be represented as follows $:\Sigma \times 3(5)\mho^{n}$, where Σ is a theoretically infinite number of variable input parameters, and $\mho^{n}$ is the volume of components a specific slot, directly derived from the three levels of the structure in five potential chronotop plans.

Each of the formal-oriented objectification / disobjectification analyzers is designed to solve the problems of implementing the parameters of the integral structure - the model of generation of structural unity. Thus, for the analysis of morphological (Booij & van Marle, 1992), lexical (Seidenberg & McClelland, 1989), syntactic and semantic implications of categories of any category in the proposed system there are no obstacles, since this structure is obtained from the sample of the input zone activity directly . However, the problem of the coexisting structures of amphibole noematics presented in the so-called modification forms of informative redundancy or informative incompleteness (Serebryakova & Zhukova, 2011, p. 20) still remains unresolved, because, as we have already described in some works on root priming in the phrase structure - in the first approximation on the material of the primary input, the priming effect is not realized in the lexical projection, i.e. assumption does not only guarantee an adequate formation of the «action scheme» but does not even give approximate options for predicting the further deployment of the holistic construct inherent in this system.

7. Conclusion

Thus, a complex network connection, which includes the principles and parameters that are universal, that is, valer coefficients in the general hierarchical system, operate under any varying conditions of semiosis, regardless of their modification. The values of the specified parameters may, however, change due to an increase in the number of connections («neural connections»), or by modifying the valency of individual newly «acquired» connections.

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