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On Modeling and the Applied Model

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Abstract. *In this article, we will talk about modeling in linguistics, in particular about the applicative model, its specific features. The study also analyzed the relationship and various aspects of the applicative model with the processes of transformation and derivation. At the same time, the article considers the formation of derived words by the applicative method, operand, operator and applicator terms in lexical derivation on the basis of examples.*

Key words: *Application, applicator, relator, operand, operator, genotype, phenotype.*

Modeling, according to many linguists, is one of the most effective methods of linguistic text research. "To know an object," writes I. B. Novik, "means to model it."[1]. In a broad, general cognitive sense, modeling represents "a certain universal aspect of the process of cognition." Accordingly, a considerable amount of research in linguistics has been carried out on the basis of transformational models, immediate-constituent models, as well as distributional models. At the same time, studies conducted within the framework of the applicative model—which, like the transformational model, possesses creativity and synergetic power—have only recently begun to attract the attention of our linguists.

The applicative model also exhibits several psycholinguistic features. According to some scholars, the applicative model is based on a chain-like linkage. However, in our view, although this is partially true, the applicative model operates both with linking chains and with complex units. In this case, the structure of the chains forms the phenotype (external form), while the structure of the complexes forms the genotype (the construction or internal architecture of units). Such an approach is found in the analyses of materials provided within the applicative generative model by S. K. Shaumyan and P. A. Soboleva[2].

We encounter similar ideas in the works of A. A. Leontyev as well. The scholar distinguishes between two types of objects — linguistic (genotypic) creativity and speech (phenotypic) creativity. [3] The first of these is called a complex. "A complex is an ordered set of elements." [4]

The main task of the applicative model is to generate correct complexes and their correct transformations. The changes within this model are not *designated*, as in Chomsky's framework, but *computed*. The computation relies on sets of sentences obtained in two stages: first, deriving a set of classes, and second, applying certain constraint rules to this set.

It should also be noted that the applicative model, when applied to the abstract material of the genotypic language of universal character, does not refer to any particular language, but is common to all languages. When these rules need to be applied to the material of a specific language, it becomes

[1]Novik, I. B. O modelirovanii slozhnykh sistem. Moscow, 1965, p. 300.
[2]Shaumyan, S. K., & Soboleva, P. A. Applikativnaya porozhdayushchaya model i ischislenie transformatsiy v russkom yazyke. Moscow, 1963, p. 35.
[3]Leontyev, A. A. *Psikholingvisticheskiye yedinitsy i porozhdeniye rechevogo vyskazyvaniya*. 3rd ed. Moscow, 2005, p. 116.
[4] Shaumyan, S. K. Strukturnaya lingvistika. Moscow, 1965, p. 184.

necessary to refer to individual genotypes in a semi-abstract state — for example, the Uzbek language genotype, the Russian language genotype, the English language genotype, and so on.

The application of the applicative model to the material of specific languages depends on the internal rules of each language and on the nature of the applicators used in them. For instance, in agglutinative languages, affixes, postpositions, and conjunctions play an important role, while in analytic languages, morphological means such as verb forms, conjunctions, prepositions, and auxiliary verbs have a major significance.

It should be emphasized that constructions are formed in two ways:

1. through the application of constructions;
2. through the transformation of constructions.

Here is a precise academic-style translation into English:

The applicative model comprises four interconnected models (generators):

1. an abstract generator;
2. a word generator;
3. a sentence generator;
4. a transformational generator.

The generative power of the applicative model is manifested in the formation of complex objects from simple ones. It is precisely this feature that makes it possible to define it as an independent linguistic theory. P. A. Soboleva's scholarly work devoted to modeling word formation is also of great importance for the description of this model. In this work, the author attempts to explain the essence of the applicative model in the simplest possible terms.

It should be emphasized that any object to which the applicative model is applied presupposes a derivational product. In particular, word formation also exhibits this property: ishchi 'worker', qalamdon 'pencil case', bog'bon 'gardener', etc.

If we analyze the given examples from a derivational perspective, ish 'work' is the operand, -chi is the operator, and the resulting structure (ishchi) is regarded as the derivative.

What is characteristic here is that the root is the primary operand (the raw material of derivation), while the relators (affixes) perform the function of operators. At the same time, the only means by which derivation is realized is application. By application in this context we mean the attachment of relators to the base.

From a linguistic point of view, the applicative generative model differs in certain respects from the transformational model and the IC (immediate-constituent) model. It employs two types of operations — application and transformation. Application is the sole rule for forming objects, while transformation is the sole rule for their invariant modification.

Let us now consider the applicative apparatus in more detail. The alphabet of symbols used in this model consists of symbols representing four classes of ideal bases:

	N	V	A	D
N	O	-	-	O
V	VN	O	O	-
A	AN	O	O	-
D	O	DV	DA	O

N — interpreted as the basic class of root nouns (e.g., *uy* 'house', *baliq* 'fish', *oyna* 'mirror');
V — interpreted as the base class of verbs (e.g., *bormoq* 'to go', *o'tirmoq* 'to sit');
A — interpreted as the basic class of adjectives (e.g., *oq* 'white', *katta* 'big');
B–D — interpreted as the basic class of adverbs (e.g., *ortda* 'behind', *oldinda* 'in front').

This can be illustrated as follows:

1. *tinch* R_3V — a verb in the position of an adjective (R_3O — implies a root adjective);
2. *gulli* R_3N — a noun in the position of an adjective;
3. *oshpaz* R_2N — a noun in the position of a noun (R_2O — implies a root noun).

In words formed compositionally, this is expressed as follows:

1. *muzyorar* R_3NV — a noun and a verb in the adjective position;
2. *oybolta* R_2NN — a noun and a noun in the noun position;
3. *ko'ksulton* R_2AN — an adjective and a noun in the noun position.

As can be seen, two operations function actively in the applicative model: application and derivation. The phenomenon of word formation also emerges within the derivational process, and therefore we study the application of the applicative model as one of the fundamental methods of lexical derivation theory.

At this point, it should be emphasized that the significant role of affixes in lexical derivation requires no further explanation, for affixes attach to a word root or stem and connect it with another word, thereby giving rise to the derivational process. However, it should also be noted that not every affix possesses this property. Some affixes do not always function as applicators. For example, if we consider the word *to'satdan* 'suddenly', neither the segment *to'sat-* nor the affix *-dan* conveys any independent meaning at the moment. Therefore, the meaning of the word as an adverbial of manner can be understood only when the word is taken as a whole. From this it follows that in this case we cannot interpret *-dan* as an applicator, since it does not serve to connect the word to a subsequent word. Affixes that function as applicators, however, are considerably more active in this regard. We see evidence of this in the following examples: *to'satdan* (applicator equals zero); *smerunum* (*ser-* is an applicator).

The specificity of the logical structure of the applicative model lies in the fact that the generative process unfolds at two levels — the level of constructions and the level of observation.

The generative process begins with the identification of ideal objects (constructive analogues of words and sentences). At the second stage of the generative process, these ideal objects, through certain interpretative rules, are transformed into the actual words and sentences of a particular language. The generative mechanism, whose raw material consists of ideal objects, operates independently of interpretative rules. Ideal objects do not reflect the grammatical categories of a given language, such as gender, number, case, possessiveness, person-number, tense, and others. These and similar categories arise only in the process of interpreting the model. Therefore, the mechanism itself, together with the ideal words and rules necessary for forming ideal sentences, or the set of ideal objects it generates, may be regarded as an *ideal language* — a system that can serve, in particular, as an intermediary language for typological comparison.

Based on the above, we may conclude that the second major mechanism underlying the realization of the derivational phenomenon is the transformational model. Although there exist significant differences between the applicative and transformational models, they may nonetheless intersect within certain speech environments. In such cases, the applicative model reaches its highest point of development. At the same time, it becomes evident that in the process of interaction between the applicative and transformational models there remain unresolved and unexplored issues. In particular, the scientific study of the synergetic power of the applicative model, in our view, is of great importance.

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