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EMERGENCE FIELD AS BASIS FOR STUDY OF INACCURATE LINGUISTIC SETS

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Abstract

The article deals with the hypothesis of the possibility of inaccurate designating of linguistic sets at the text vocabulary level based on the emergence field. An emergence field based on the speech situation arises, where the boundary of the structural semantic model is indicated, predicting the verbal form of the given speech situation. The emergence field when analyzing different translations of the same work is observed, because any text that needs to be verbally interpreted is a model of the speech situation. The main task is to identify an inaccurate model, capable of calculating the amount of inaccurate linguistic sets with the maximum probability within the emergence field, being potentially applicable as language material for a given speech situation. Moreover, the article aims to define the frequency of certain lexical units, thereby determining their emotional and manipulative potential in the text formation. Brief information on the "emergence field" concept, its structure and formation, functional significance of the emergence field in terms of interpreting the speech situation are studied. The definition of the "emergence field" is given. Based on a specific experiment, it is concluded that marking the emergence field and determining its lexical and structural potential allows determining inaccurate models in the emergence field. The designation of inaccurate models based on the emergence field can contribute to the designation of the structural semantic potential of the speech situation as a whole, allowing creation of an algorithm for speech situation development creating programs applicable for artificial intelligence elaboration.

Keywords: Emergence, field, linguistic, sets, speech, situation..

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1. Introduction

The language system among all the nonlinear systems can be considered as the most researched, since it is the most subjected to empirical analysis. A language consists of multiple elements that together form semantic units. The complexity of language system units is one of the conditions for its acquisition of semantic significance (Solntsev, 1973; de Saussure, 2004). Complexity can also be the cause of the entropy increase in a particular model of the text, carrying both information redundancy and information failure (Berdychesvsky, 2012; Albekov, 2015). However, the question of whether it is possible to predict a text variant that is most adapted to a specific speech situation, whether an algorithm is eventual, which predicts the text model in such a complex system as the language remains controversial.

L. S. Vygotsky, defining the relationship of thinking and speech processes, notes that the central idea can be expressed in a general formula, hence, first of all thought relation to the word is not a thing, but a process; this relation is a movement from thought to word and back - from word to thought. (Vygotsky, 1999; Glukhov, 2005).

2. Problem Statement

We believe that the motivation, being considered from the point of view of generating a verbal system, is a consequence of the speech situation itself, because the speech situation forms an emergence field in which the motivation is strictly individual for each speech subject (Luria, 1979). This means that, on the basis of the speech situation, an emergence field arises in which the boundary of the structural-semantic model is indicated, predicted as the verbal form of the given speech situation (Albekov, 2015). The variability of the verbal form is strictly individual and depends on many factors, both linguistic and extralinguistic (Sternin. 2007). It should be noted that the emergence of each text version is manifested in the structural-semantic originality, uniqueness.

3. Research Questions

Given that the variable form of speech situation verbalization is strictly individual, the question arises whether it is possible to predict a verbal model of a speech situation regardless of the individual that is a speech subject.

4. Purpose of the Study

In search of a problem solution, as well as using this question as a reference point, we developed the “emergence field” concept, interpreted as a language system unit, which has a polydirectional universal structure that assumes the presence of a core, center and periphery, including, along with a common concept, multi-level means of a functioning language system: phonemic, word-formation, lexical, phraseological, morphological, syntactic, stylistic, textual, which interaction assumes a meaning increment in the text, revealing in emotionally significant speech situations as a potential, process or result of all actions occurring in a polydirectional situation, and is accompanied by a change in the semantics of linguistic units: phonemes, morphemes, lexemes, sememes, syntax structures (Bronnik, 2009; Zherebilo, 2017; Albekov, 2015; Shaumyan, 1999).

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As a result of numerous studies related to the field emergence formation in various speech situations, we came to the conclusion that*: the emergence field is a structural semantically designated situational reality resulting from the overcoming bifurcation points by deterministic chaos, on the basis of which certain verbal models of speech situation elaboration are predicted* (Albekov, 2015).

The emergence field turned out to be the most promising in the text analysis: oral, written, printed, electronic. As a unit of linguistic system, the emergence field has a number of properties that predict its use in the process of studying multidimensional structures.

Such field properties as complexity, integrity, multicomponent, determinacy are indicated. For instance, complexity as a field property is associated with the internal diversity of the language system, the diversity of its units and subsystems, which creates flexibility of the emergence field, the ability to change the semantics of the units included in it. Assuming that each complete structural semantic system can be identified with a particular model; we can say that the emergence field can be larger than the system, congruent to the system and less to the system.

The emergence field may be larger than the system when the system is becoming established, namely, when the process of becoming a system passes the bifurcation point and the situation passes into the so-called deterministic chaos from the total chaotic state, in which the development vector of the situation is determined. A field is formed in this development vector of the situation, in which the entire potential of the system possible variants is indicated.

The emergence field may be to congruent to the system, when the system has entirely developed, but synergistic processes that introduce some qualitative changes in the system units, continue inside the system.

The emergence field may be smaller than the system, when the system is the subject to various interpretations. In this case, the emergence field, as the manifestation basis for the emergence property of a system, is this system unit. (Figure 01).

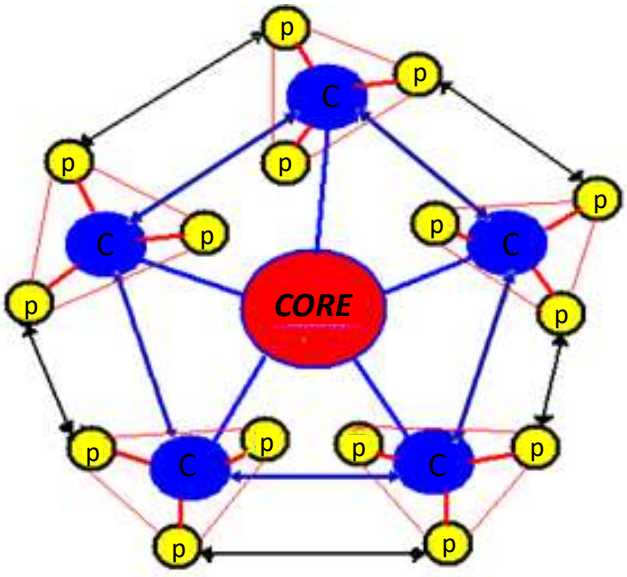

Figure 01. Emergence field scheme

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The volume of the emergence field depends on the system unit size, respectively, the larger the system unit, the greater the emergence field volume.

It is curious when verbalizing the speech situation, the emergence field core, that is to say name, is universal for all languages. This means that a certain speech situation generates the core, which can be verbalized by an identical name in all languages.

Regarding the emergence field center, namely, the simplest syntactic variants, they are universal for the structural semantic formation of a particular language or related languages. In the center of the emergence field, we have the simplest verbalization variants of the speech situation, that is to say, options that indicate the speech situation in "two words".

The emergence fields being at the peripheral level in which linguistic inaccurate sets are activated, verbalization options of the speech situation are strictly individual, that is how many people, so many options.

Having denoted the structurally semantic form of the “emergence field” concept, which we described in detail in our previous publications, we have set the task in the framework of this work to find an answer to the question: if it is feasible to design an inaccurate model of the speech situation verbal form within the emergence field.

Under inaccurate modeling, we mean an approximate, possible modeling version, in which, due to the extreme complexity and multidimensionality of objects and modeling tools, it is impossible to determine a clear form of expression, to cover the sum of all verbal images accumulated in all individuals.

In search of an answer to the above indicated question, which **became the main goal** of this article, we carried out work to determine the linguistic potential (in terms of the used linguistic resources) of the emergence field arising on the basis of a specific speech situation. As a material for analysis, we studied more than 1,600 texts of various artistic and informational journalistic works on the theme*: love, friendship, work, leisure, study, family*. In the process of conducting our research, we used the methods of a) statistical calculations, namely, frequency of certain lexical units use, the presence of lexical units in the text that are not directly related to the topic, types of syntactic structures, etc. b) *case* method , for determining extralinguistic factors.

The simplest material for the empirical definition of the emergence field linguistic potential is different text versions, reflecting the same speech situation. The emergence field occurrence on the basis of the speech situation can be simply observe in the analysis of different translations of the same work, because any text that should be interpreted verbally, is a speech situation model (Luria, 1979).

5. Research Methods

Accordingly, the main method that we used in the process of conducting our research was statistical analysis method.

Undoubtedly, emergence appears in each translated variant, that is to say a property inherent only in this variant, acquired due to the integrity and completeness of the form, structural and stylistic originality, integrity and completeness of the semantic component. As A. Leonenkov notes, the system modeling process in solving complicated problems takes quite a long time, during which, generally speaking, both the content of the original problem and the resources necessary for its solution can be varied (Leonenkov,

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2005). The main objective of this study, as noted above, is an attempt to designate an inaccurate model, which is able to calculate the amount of inaccurate linguistic sets within the scope of the emergence field with maximum probability, potentially applicable as a language material for a given speech situation, as we understand an inaccurate model as the informational logical model of the system, built on the basis of the theory of inaccurate sets and inaccurate logic (Pytjev, 2004).

Let us put an example of inaccurate linguistic sets designation, taking as a basis the 90 sonnet by W. Shakespeare, the original of which we denote as the initial speech situation for different interpretation variants, namely, translations.

In order to define the volume of inaccurate linguistic sets at the lexical unit levels of a composition with maximum probability within the emergence field limits, we used the Statanaliz computer program to calculate the growth dynamics of the lexical units number (excluding particles and prepositions) in eighteen translation variants of the 90 sonnet by W. Shakespeare.

In order to save space, we will not give the text of translated options, but only the first line.

90 Sonnet.

Then hate me when thou wilt; if ever, now;

Subscript translation

Тогда, ненавидь меня, если будешь, когда либо, то теперь (Togda, nenavid’ menya, esli budesh, kogda libo, to teper’).

90 Sonnet translations:

1. **S. Marshak:**

   Уж если ты разлюбишь - так теперь (Uzh esli ty razlubish – tak teper’),

2. **V. Mikushevich:**

   Не откажи хоть в ненависти мне (Ne otkazhi khot’ v nenavisti mne),

3. **A. Kushner:**

   Уж если так - возненавидь скорей (Uzh esli tak – voznenavid’ skorej),

4. **T. Shchepkin-Kupernik:**

   Так пусть же ненависть является твоя (Tak pust’ zhe nenavist’ yavlyaetsya tvoya);

5. **T. V. Zherebilo**.

   Коль хочешь ненавидеть, ненавидь сейчас (Kol’ khochesh nenavidet’, nenavid’ seichas),

6. **T. V. Zherebilo**

   Коль хочешь ненавидеть, то сейчас, мой друг (Kol’ khochesh nenavidet’, to seichas, moi drug),

7. **V. Mikushevich**

   Уж если ненавидишь - не скрывай! (Uzh esli nenavidish – ne skryvai!)

8. **M. Chaikovskij**

   Коль хочешь быть врагом мне - будь им ныне (Kol’ khochesh byt’ vragom mne – bud’ im nyne),

9. **N. V. Gerbel**

   Когда моим врагом быть хочешь - будь теперь (Kogda moim vragom byt’ khochesh – bud’ teper’),

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10. **S. I. Turukhtanov**

Оставь меня сегодня, будь жесток (Ostav' menya segodnya – bud' zhestok)

11. **R.Badygov**

Когда весь мир невзгоды на меня (Kogda ves' mir nevzgody na menya)

12. **V.Bojko**

Бей, если хочешь, только нынче бей (Bei, esli khochesh, tolko nynche bei),

13. **A.Kuznetsov**

Коль ты возненавидишь, - так теперь (Kol' ty voznenavidish, - tak teper') ,

14. **A.Sitnitskij**

Возненавидь меня теперь, сейчас, во дни (Voznenavid' menya teper', seichas vo dni)

15. **B.Leivi**

Коль ненавидеть, ненавидь теперь (Kol' nenavidet', nenavid' teper').

16. **S.Stepanov**

Коль ты решил, порви со мной теперь (Kol' ty reshyl, porvi so mnoi teper'),

17. **A.M.Finkel**

Что ж, ненавидь! Но не сейчас (Chto zh nenavidet'! No ne seichas).

The number of lexical units in the original text, taken as the basis of the speech situation, is 64 lexical units. The growth dynamics was calculated taking into account the appearance of new lexical units, unused in previous versions in the volume of inaccurate linguistic sets. With the appearance of each new option the calculation was made; a) the amount of vocabulary units (VU), b) the amount of lexical units used two or more times, c) the sum of the used lexical units. The results have been displayed in the Table 01.

Table 01. Calculation of inaccurate linguistic sets

№	Number of combined Options	Number of used LE	Number of used LE 2 and more times	Total amount of used LE with regard to repetitions
1	**Two** Subscript + S. Marshak	**90**	**19**	**135**
2	**Three** + A. Kushner	**130**	**29**	**209**
3	**Four** + V. Mikushevich 1	**165**	**33**	**263**
4	**Five** + T.V. Zherebilo 1	**192**	**47**	**349**
5	**Six** + T.V. Zherebilo 2	**201**	**75**	**422**
6	**Seven** + V. Mikushevich 2	**229**	**77**	**474**
7	**Eight** + M. Chaikovskij	**263**	**85**	**540**
8	**Nine** + V. Gerbel	**297**	**98**	**629**
9	**Ten** + S.I. Turukhtanov	**335**	**104**	**707**
10	**Eleven** + R. Badygov	**362**	**109**	**765**
11	**Twelve** + V. Bojko	**385**	**120**	**767**

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12	**Thirteen** + A. Kuznetsova	**404**	**123**	**853**
13	**Fourteen** + A. Sitnitskij	**426**	**134**	**1075**
14	**Fifteen** + B. Leivi	**464**	**138**	**1118**
15	**Sixteen** + S. Stepanova	**483**	**145**	**1136**
16	**Seventeen** + A.M. Finkel	**499**	**154**	**1155**
17	**Eighteen** + T. Shchepkin-Kupernik	**513**	**159**	**1160**

6. Findings

In this way, the potential of inaccurate linguistic sets in the emergence field at the lexical units level in 18 variants of the speech situation interpretation indicated in 90 sonnet by W. Shakespeare (where the original consists of 64 lexical units), with the maximum probability is determined by the amount:

513 – vocabulary units;

159 – lexical units, used two or more times;

1160 – lexical units that make up the total number of used lexical units in the interpretation variants.

The analysis showed the following results:

- the speech situation may consist of an unlimited number of interpretations речевая.
- a dynamics of increasing the inaccurate linguistic sets number at the vocabulary level by 25–30% is observed from 2 to 12 variants of speech situation verbal interpretation;
- a decrease in the growth of lexical units on average up to 3–1% is observed from 22 to 26 variants of interpretation;
- 99.8% of the inaccurate linguistic sets potential of the emergence field at the vocabulary level is indicated in 30–35 verbal interpretations of the speech situation.

7. Conclusion

The results obtained during the analysis allow us to conclude that the emergence field formed on the basis of a certain speech situation has only a limited potential of fuzzy linguistic sets, which at the level of lexical units can be empirically determined.

The empirical definition of inaccurate linguistic sets potential, which, as mentioned above, is denoted within 30–35 variants of verbal interpretation, makes it eventual to construct inaccurate models of speech situation interpretation variants (in monologue situations in our case) without a reference to a particular speaker.

Taking the obtained results as a basis in the above indicated analysis, we decided to conduct an experiment, the purpose of which was to work out an inaccurate model of the speech situation verbalization. Based on inaccurate linguistic sets, namely, lexical units obtained during the analysis, we decided:

1) to allow the computer to design its own version of the 90 sonnet by W. Shakespeare translation. The main idea was to provide the computer with the possibility of choosing from the potential inaccurate linguistic sets of the emergence field of the most “suitable” interpretation version of each of the lines of all

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18 translation variants, without adding a single lexical unit to designated eighteen interpretation variants in the emergence field;

2) to produce our own version of the subscript translation, based on the volume of lexical units indicated in the emergence field, without adding a new unit.

This operation was undertaken to determine the increase of the text manipulative potential increases when the amount of inaccurate linguistic sets that are potentially applicable to the verbalization of a given speech situation is strictly indicated.

To sum up, we have obtained the following results.

The subscript translation variant of the 90 sonnet by W. Shakespeare, made by computer:

1. Коль хочешь ненавидеть, так ненавидь теперь (Kol' khochesh nenavidet', tak nenavid' teper')
2. Теперь, когда весь мир грозит меня пресечь (Teper', kogda ves' mir grozit menya presech')
3. Соединяясь со злой судьбой, согни меня (Soiedinyayas' so zloi sud'boi, sogni menya)
4. Но только не последней каплей горя (No tol'ko ne poslednei kaplei gorya)
5. Ах, уходи, добить в печали грудь (Akh, ukhodi, dobit' v pechali grud')
6. Вслед за ночной бурей не будь дождливым, утро (Vsled za nochnoi burej ne bud' dozhdlivym, utro)
7. Чтоб отдалить намеченное сверженье (Chtob otdalit' namechennoe sverzhenje)
8. И коль покинешь ты меня, покинь теперь (I kol' pokinesh ty menya, pokin' teper')
9. Когда ж мелких бед настанет час и пусть (Kogda zh melkikh bed nastanet chas i pust').
10. Так уйди сразу, и дай ощутить сейчас (Tak uidi srazu, I dai oshchutit' seichas)
11. Все худшие из ударов рока (Vse khudshie iz udarov roka)
12. И все невзгоды, что ныне мнится горем (I vse nevzgody, chto nyne mnitsya gorem)
13. По сравнению с утратой тебя покажутся ничтожны (Po sravneniyu s utrtoj tebya pokazhutsya nichtozny).

Computer translation was based on words that have the maximum number of uses in translation options.

The above examples allow us to conclude that the emergence field designation and the determination of its lexical and structural potential makes it possible to identify inaccurate models in the framework of the emergence field. The designation of inaccurate models based on the emergence field can contribute to the designation of the structural semantic potential of the speech situation as a whole allowing to create an algorithm for the speech situation development, namely, creating programs that can be applied in the artificial intelligence development. The emergence field can become both a theoretical and a practical basis for the linguistic planning of the speech situation verbalization. It goes without saying, on the basis of the emergence field it seems to be impossible to identify the full potential of inaccurate models from the point of view of syntactic constructions, having been already verbalized variants of the text, since any text is absolutely unique. At the same time, the designation of the inaccurate sets potential at the vocabulary level enables to predict the structures of the most manipulative speech situation interpretations.

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