Dictionary of Abstract the Words of the Russian Language: Nouns with High Numerical Measure of Abstractness

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Abstract: This article demonstrates an experiment based on one of the possible means of creating a semantic dictionary of abstract words. It also analyzes its first results, lexical units that have shown a high level of abstraction in our enquiry among native speakers. The widening field of researches that study abstract words demands a precise definition of units that can be classified as concrete nouns as opposed to the abstract ones. However, this task is made more difficult by a polysemy and complex semantic structure of abstract words. Ideas of cognitive approach point to the fact that one word can have features of both concrete and abstract units, to a different extent depending on context and individual perception. In this approach, the leading role belongs to the semantic criterion of differentiating between concrete and abstract lexical units. It is suggested that this principle should be taken into account when creating a dictionary of abstract vocabulary. While defining the degree of abstraction of a word, a psychosemantic enquiry of native speakers of Russian can be helpful. Results of such interrogation are described in this article.

Keywords: Abstract Vocabulary, Concrete Vocabulary, Semantic Criterion Morphological Criterion, Psychosomatic Survey.

INTRODUCTION

The term lexico-grammar refers to two distinct but related notions: the typical lexical and grammatical environment of a sign as it is habitually used in naturally occurring texts or 'discourse', and the core stratum of 'wording' in Michael Halliday's model of language, which serves to mediate between the lower stratum of 'sounding' (graphology/phonology) and higher 'meaning' (semantics/discourse). As this notion was first developed in the framework of Systemic Functional Linguistics (SFL) (Halliday & Matthiessen 2004), it is important to set out here some of the core features of the SFL approach. At the moment, a scope of problems related to the understanding of and differentiating between lexico-grammatical classes (LGC) of concreteness and abstractness is being widened. In many contemporary studies, this complex of problems falls beyond the scope of mere linguistics. Abstract and concrete vocabulary is studied with the purpose of evaluation of difficulties in perception of texts (Naumann *et al*., 2018; Solnyshkina & Kiselnikov, 2015; Ivanov *et al*., 2018), as part of psycholinguistic research (Oliveira *et al*., 2013) and studies of memory (Mate *et al*., 2012). Abstract words are studied in relation to neurolinguistic research of the human brain and speech (Loiselle *et al*., 2012).

However, there is a number of discrepancies in various linguistic approaches; firstly, in defining abstract and concrete words, and secondly, in detecting criteria of differentiating between these lexical units (Zeng, & Wen, 2018). While modern linguistics, under the generative influence, has been trying to model the human language on the basis of a rather small number of samples, scholars working in the lexicon grammar framework have been concentrated on the construction of syntactic and lexical databases for more than thirty years (Gross 1975; Gross 1994; Boons *et al*. 1976; Guillet & Leclère 1992). The lexicon-grammar methodology consists in establishing a taxonomy of syntactic-semantic classes the lexical items of which share some syntactic features. For instance, class 33 contains verbs that enter the construction with a human nominal subject and one indirect complement introduced by preposition à. Each class is represented with a table including all the lexical items of the class (Lenci, *et al*., 2018).

The study of the semantic criterion of differentiation between abstract and concrete lexical units uncovered a certain «semantic ambiguity» of abstract nouns which proves the importance of cognitive approach when studying these LGC and, which is even more important,

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allows us to speak of the fact that words can contain a component of abstraction and a component of concreteness at the same time, depending on the context or perception (Lusekelo, 2020). Therefore, it makes sense to create a dictionary of abstract words where every word would have an index showing its degree of abstraction or concreteness. We will note that such an approach has already been taken when creating a similar dictionary of English (Brysbaert *et al*., 2014).

LITERATURE REVIEW

There is a wide range of research and scientific resources to study the subject of this article. In Montefinese studies (2019): Evidence from both behavioural and neuropsychological studies suggest that different types of organizational principles govern semantic representations of abstract and concrete words. The reviewed neuroimaging studies provide new evidence about the role of brain areas of the semantic network involved in the encoding of some types of information during processing of abstract and concrete concepts, characterizing better the neural underpinnings and the organizational principles of semantic representation of these types of word.

Also, Alessandro Lenci (2018) believes that Recent psycholinguistic and neuroscientific research has emphasized the crucial role of emotions for abstract words, which would be grounded by affective experience, instead of a sensorimotor one. The hypothesis of affective embodiment has been proposed as an alternative to the idea that abstract words are linguistically coded and that linguistic processing plays a key role in their acquisition and processing.

Vigliocco *et al*. (2009) argue that the embodiment of abstract concepts is provided by affective experience. We will refer to this proposal as the Affective Grounding Hypothesis (AGH), which rests on the following assumptions:

- All concepts are constituted by two types of information, experiential and linguistic. The latter comes in the form of distributional statistics extracted from the linguistic input. The former crucially includes sensory, motor, and affective information.
- Sensorimotor information is preponderant for concrete word meanings, while affective and linguistic information is more preponderant in abstract word meanings.

According to Khokhlova studies (2014), Abstract nouns have attracted attention ever since Plato and Aristotle set the issues of distinguishing the abstract and the concrete and intended to study the nature of abstraction both as a process and result of cognition. Nevertheless, even now most arguments have not been resolved. Researchers emphasize that the issue of abstract nouns demands further investigation and suggest their own approaches to tackling this group of words. Language acquisition studies also contribute to the understanding of the phenomenon of abstraction and abstract words. The researchers, who unanimously claim that both children and adults understand and remember concrete words better and, moreover, the ability to process abstract words develops with age, proposed two essential theories explaining this fact. First, there is “double code” theory by A.Pavio stating that concrete words are easier to work with as they are stored in people’s mind both as a word, a lexical unit, and an image, whereas in order to understand or use abstract words speakers can only rely on the verbal code. The second theory, known as “context theory” claims that abstract words do not have a context in its broad sense, that is feelings, associations, emotions linked to a word; thus, such words as longitude, apprehension and others are only based on our understanding of these concepts.

According to Mestres-Missé studies (2014) Over many years, studies have shown that concrete and abstract words exhibit performance differences. In contrast to abstract concepts, concepts to which concrete words refer can be easily inferred from sensory experiences. For example, the concept cake and its corresponding word are associated with many sensory properties (taste, shape, etc.). In contrast, the meaning of an abstract word (e.g. truth) is not associated with sensory qualities, and therefore is difficult to imagine.

Mestres-Missé and others (2014) in their study concluded that The current experiments demonstrate that both concrete and abstract new-word meanings can be successfully learned from contextual information. Nevertheless, new concrete word meanings were derived faster than new abstract word meanings. This difference was maintained albeit equal context availability. Even though, in a strict sense, our results do not support the context availability model, the weight and importance of this theory should not be diminished. The present investigation evidenced that imageability/concreteness is not a dual feature, but a continuum with highly asymmetric words at opposing

ends but growing concurrence as one approaches the middle point. In this sense, concrete and abstract words with similar context availability exhibited, respectively, lower and higher imageability/ concreteness, and smaller learning differences than concrete and abstract words with unlike context availability. Furthermore, we conclude that the concreteness effect observed in learning is due to the different organization of abstract and concrete conceptual information in semantic memory, with concrete words depending more on semantic similarity information, and abstract words on associative information.

METHODS

The article describes an experiment based on one of the possible ways of creating a semantic dictionary. This method has already been described and applied by way of an experiment (Solovyev *et al*., 2019). The method was applied to 1,000 most common words of the Russian language. Every word was assessed by 40 native speakers of Russian. The respondents were students of the philological faculty of Kazan Federal University[1] and the Belarusian State Pedagogical University[2]. The results were presented in the articles (Solovyev *et al*., 2019; Zhuravkina *et al*., 2020).

Based on the results of this study, we run a similar survey but with a broader scope of informants, from various age groups and with different levels of education. Thus, the method is based on the semantic criterion of differentiating between LGC of abstraction and concreteness, as well as the ideas of the cognitive approach to language study (Solovyev *et al*., 2019).

In cognitive linguistics, linguistic facts are often explained beyond the linguistic reality and they gain nonlinguistic nature – social, cultural, psychological, etc. Language activity is regarded as one of the models of cognition and it is based on cognitive abilities which are not linguistic but create prerequisites for language. As an example, Langacker's Cognitive grammar is an interesting theoretical account of cognitive processing reflected in linguistic structure. A fundamental principle in this approach is the idea that it is not actually suggested to focus on language separately from the cognitive activity of memory, attention, social contacts of people or any experience. The very nature of language fits the extralinguistic reality – both mental and social (Langacker 1987, 1991; Lacoff 1987). According to some representatives in this field knowledge of the structure of grammar is built step by step, the way the words in the language are used. Input is the starting point and students acquire linguistic items and structures for shapes and sizes, for different levels of abstraction and just then they produce their own utterances, linking some of them to express their communicative intent (Tomasello 2003).

The glossary of the semantic dictionary was supposed to be based on the results of the psychosemantic survey of native speakers (Solovyev *et al*., 2019). Furthermore, lexical units for the survey were chosen on the basis of the Contemporary Russian Frequency dictionary by O.N. Lyashevskaya and S.A. Sharov (Lyashevskaya & Sharov, 2009). Reference to the frequency dictionary is explained by the fact that frequency is one of the conditions of a clear understanding of a word by a native speaker (Luria, 1979).

Respondents were asked to assess the degree of abstractness of words and rate them on a scale of 1 to 5, 1 being the highest degree of concreteness, and 5 - abstractness. Rate 3 on this scale points to the fact that a respondent sees both features in a given word.

The enquiry also contained questions about the responders' age, gender, education background and the language that was native to the responder.

Before completing the enquiry, the respondents were offered an instruction which defined the LGC of concreteness and abstraction. It was pointed out to them that one word could have features of both categories.

We'll note that a similar method was used in the process of creating of a similar dictionary of the English language (Brysbaert *et al*., 2014).

We have run two surveys that consisted of 50 most frequently used words and 50 less frequently used ones (Lyashevskaya & Sharov, 2009) among 60 native Russian speakers. There were two age groups: 18-35 and 36-55. As a result, each lexical unit was given an average index of abstraction.

RESULTS AND DISCUSSION

Before describing our results, we will discuss the theoretical basis for this research. Firstly, abstractness

[1]Kazan University, one of the oldest universities in Russia, was founded on November 17, 1804.

[2]Maxim Tank Belarusian State Pedagogical University also known as BSPU is a university in Minsk, Belarus. It specialises in teacher training of mathematics, chemistry, physics, psychology, geography, history, languages and others for primary and secondary schools.

and concreteness of words are treated as lexico-grammatical classes, and not as grammatical categories (Bondarko*,* 2005). Categories may be described and named with regard to the type of meanings that they are used to express. For example, the category of tense usually expresses the time of occurrence. However, purely grammatical features do not always correspond simply or consistently to elements of meaning, and different authors may take significantly different approaches in their terminology and analysis. For example, the meanings associated with the categories of tense, aspect and mood are often bound up in verb conjugation patterns that do not have separate grammatical elements corresponding to each of the three categories; see Tense–aspect–mood (Matthews, 2012).

Secondly, we assume that the semantic criterion of differentiating between abstract and concrete nouns is the leading one, whereas morphological and word-formation criteria are optional. Morphology is usually understood as the branch of linguistics that investigates word structure, a topic of central relevance to the systematic study of language and language processing. The Western grammatical tradition begins with the identification of words as the smallest meaningful elements of speech, a conception that survives largely intact in contemporary word-based models of morphology and grammar. Synchronic, historical, and behavioral evidence also suggests that words are not only organized into syntagmatic units but also into paradigmatic collections. On the syntagmatic dimension, words are composed of morphs and themselves form parts of larger syntactic constructions. Orthogonal to these structures, inflected and derivational forms exhibit an organization into inflectional paradigms and larger morphological families. This chapter outlines some of the linguistic issues that arise in describing words and their structure (Blevins, 2014).

Denotations for concrete nouns are objects of the concrete, material world. Accordingly, abstract words are nouns that have denotations in the non-material world, phenomena that cannot be seen or perceived by our five senses (Schmid, 2012). In other words, abstract lexical units are the result of abstraction of the denotative-referential level. Thus, it is possible to define these LGC as predicates: concrete nouns are predicates of things, abstract nouns are predicates of names or ideas. Such a definition of abstractness or concreteness is based on the semantic criterion of differentiating between the LGC of nouns.

In this article, we will, firstly, analyze details of the first survey that dealt with 50 most frequent words, and the second survey that consisted of 50 less frequently used words (Figure **1**), and secondly, we will analyze the units with the most significant degree of abstractness which our survey has shown.

The enquiries led to detecting words with a fluctuating degree of abstractness/concreteness. Such words were equally classified by our respondents either as abstract or as concrete, or given a medium value. In the first enquiry, those were the words *«mesto»* and «*vopros*». Our second enquiry had more words like that; *«byt»*, *«vselyennaya»*, *«lyubitel»*, *«prizyv»*, *«dostup»*, *«ukrepleniye»*, *«cosmos»* (Table **1**).

This kind of results mostly points to the difficulties in perception of the less frequent nouns. Besides, the listed nouns have multiple meanings.

Received results seem to reflect the ideas of the «Mode of acquisition» (MoA) (Della Rosa *et al*., 2010). This concept is founded on a presupposition that the

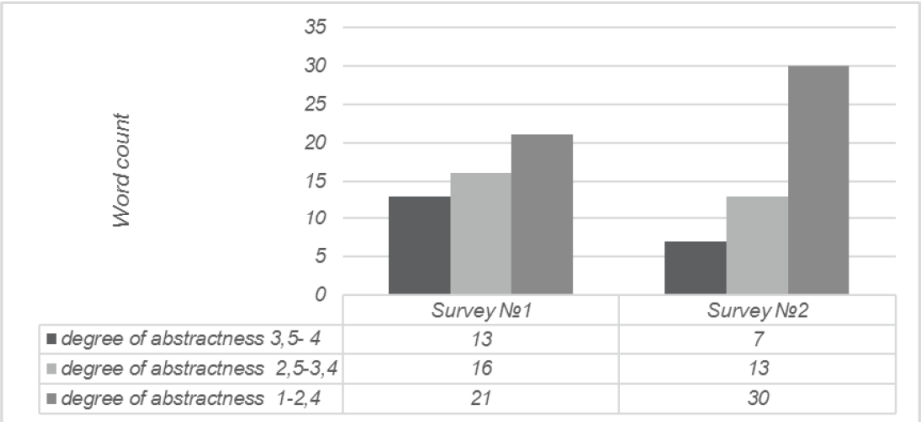

Figure 1: Results of the first and second surveys.

Table 1: Lexical Units with a Fluctuating Degree of Abstractness/Concreteness

Word	Index 5	Index 3	Index 1
«mesto» (place)	15	17	13
«*vopros*» (*question*)	15	15	18
«byt» (*daily routine, living conditions, way of life*	12	10	13
«vselyennaya» (*universe)*	14	18	16
«lyubitel» (*lover, amateur)*	11	15	13
«prizyv» (*call, appeal, military conscription)*	10	14	12
«dostup» (*access)*	11	12	14
«ukrepleniye» (*fortification, strengthening; frontier)*	13	14	10
«cosmos» (*cosmos)*	14	13	12

meaning of a word can be acquired either by perception, that is, based on the subjective experience (sensory-motor experience), or linguistically, which means that the word will be viewed as part of the language with a definite fixed meaning; or by a combination of the two. The meaning of any given word appears to be an interaction of various associations that occur when decoding the unit in view. These associations can be linguistic by nature or be based on personal experience. For example, the linguistic perception of the word «love[3]» can be expressed in the following semantics: «The feeling of deep attachment to someone or something» (Kuznetsov, 2000). The perceptive mode will say that love is a mother hugging her child, or a happy couple, etc. This mode brings back vivid associations of the physical world. Thus, love can be understood as a feeling, and in this case it will be highly abstract; or the meaning of the word can be equated to the object of love or to its image (mother = love, mother and child = love). Such units from our enquiries are studied below using examples of words with a high level of abstraction.

From the examples used above (lexical units with fluctuating abstractness/concreteness index) it can be seen that the respondents were based on one of the modes described, or on their combination. Let us look at the word «*prizyv*» («call, appeal, military conscription»). For some respondents, the semantics of this unit may have been acquired by a linguistic mode, and then the noun will be perceived as abstract based on the fixed and commonly used meaning of this word. Or the meaning of the word can be tied to the person's experience: a concrete call to do something, or military conscription. In this case, the lexical unit is associated with a specific event, person or image, and thus can have some features of concreteness.

Let us now analyze the lexical units with a high level of abstractness. We will look at words with abstractness index from 5 to 3.4. In the first enquiry, those were: *otnosheniye* (*relationship*), *sila* (*power, energy), vid (view), obraz (image), vremya (time), pravo (law, right), vosmozhnost'* (*possibility, opportunity*), *konetz (end), mir (peace, world), sistema (system), storona (side), sluchai (happening), resheniye* (*decision)*. In the second enquiry the words are: *voobrazheniye* (*imagination*), *slabost'* (*weakness; inclination), preobrazovaniye* (*transformation, reform), fantasia (fantasy), vozniknoveniye (emergence), regulirovaniye* (*regulation, adjustment), tolk (sense).* However, we have to note that no unit was rated as 5 or even close to 5. At the same time, a number of lexical units (13) were rated as 1 or close to 1, which means that these words were identified as concrete nouns. Lexical units with a higher index of abstractness were not viewed by respondents as definitely abstract.

At the first stage, let us look at the words that have word-formative features pointing to their abstractness: otnosheniye, vozmoshnost', resheniye, voobrazheniye, slabost', preobrazovaniye, vozniknoveniye, regulirovaniye.

The average abstraction index for the word *«otnosheniye»* (*relationship*) is 3,9. During the enquiry index 5 (i.e., «definitely abstract») was chosen by 25 respondents out of 60; index 4 – by 17 people out of 60; index 3 – by 12 people out of 60; index 2 – by 3

[3]The word <<love>> can have a variety of related but distinct meanings in different contexts. Many other languages use multiple words to express some of the different concepts that in English are denoted as <<love>>; one example is the plurality of Greek words for <<love>> which includes agape and eros. Cultural differences in conceptualizing love thus doubly impede the establishment of a universal definition (Oxford Dictionary, 1998).

people out of 60; index 1 – by 3 people out of 60. The abstraction index of the word «*resheniye*» (*decision)* is 3,5. Index 5 was chosen by 18 people out of 60, index 4 – by 11 people, index 3 – by 17 people, index 2 – by 8 people, index 1 – by 6 people.

The abstract word-formative feature of the words *«otnosheniye»* (*relationship*) and *«resheniye»* (*decision)* is the suffix -eniy(e). To study their semantic and morphological criteria we will turn to Big Definition Dictionary edited by S.A. Kuznetsov (Kuznetsov, 2000).

This dictionary gives 7 meanings for the word *«otnosheniye»* (*relationship*) (Kuznetsov, 2000). In its third meaning («Ties or bond between someone or something created as a result of interaction or common activity») this word can only be used in the plural which points to the looseness of the morphological criterion when applied to this word. In its sixth meaning («An official paper containing an inquiry or notification») and in its seventh meaning («Ratio generated by dividing one number by another; a record of such manipulation») the word has some signs of concreteness because its denotation appears in the semantics that can be found in the visible, material world. Similar observations apply to the word *«resheniye»* (*decision):* it can be used in the plural, there are signs of concreteness in its semantics (an original engineering solution; algebraic solution of the problem, etc.).

The abstraction index of the word «*vozmozhnost'*» (*possibility, opportunity*) is 3,7. Index 5 was chosen by 16 people; index 4 – by 23 people, index 3 – by 12 people, index 2 – by 4 people, index 1 – by 5 people.

The abstract word-formative feature of the word «*vozmozhnost'*» (*possibility, opportunity*) is the suffix -ost'. The dictionary gives two meanings of the word (Kuznetsov, 2000). In its second meaning («Means, conditions, circumstances that are necessary for achieving a goal or accomplishing something») the word is usually used in the plural. Also, in this meaning the word can be correlated to a real, existing denotation: material or financial resources.

Let us move to words from this group used in the second enquiry.

The abstraction index for «*voobrazheniye»* (*imagination*) is 4,1. Index 5 was chosen by 33 people out of 60, index 4 – by 10 people, index 3 – by 8 people, index 2 – by 2 people, index 1 – by 7 people. The word-formative feature of the word *«voobrazheniye»* is the suffix -eniy(e). The word can be used in the plural (Schmid, 2012).

The abstraction index of the word *«slabost'»* (*weakness; inclination)* is 3,9. Index 5 was shosen by 24 people out of 60, index 4 – by 16 people, index 3 – by 12 people, index 2 – by 5 people, index 1 – by 3 people.

The abstract word-formative feature of the word *«slabost'»* (*weakness; inclination)* is the suffix -ost'. The word can also be used in the plural. The dictionary gives three meanings of the word (Kuznetsov, 2000). In its second («A certain disposition, habit or inclination towards something») and third meanings («That which invokes attraction or appetite») the word can correlate to an object that is a denotation of concrete nouns: proclivity for alcohol (alcohol=proclivity), proclivity for books (books=proclivity), etc.

The abstraction index of the word *«preobrazovaniye*» (*transformation, reform)* is 3,8. Index 5 was chosen by 22 people out of 60, index 4 – by 22, index 3 – by 8 people, index 2 – by 2 people, index 1 – by 6 people. The abstraction index of the word *«regulirovaniye»* (*regulation, adjustment)* is 3,7. Index 5 was chosen by 19 people out of 60, index 4 – by 16 people out of 60, index 3 – by 17 people out of 60, index 2 – by 3 people out of 60, index 1 – by 5 people out of 60.

The abstract word-formative feature of the words *«preobrazovaniye»* (*transformation, reform)* and *«regulirovaniye»* (*regulation, adjustment)* is the suffix -eniy(e). In some meanings these words show signs of concreteness (Kuznetsov, 2000).

These examples show that our respondents mostly relied on the semantic criterion as the main criterion of rating the words on the abstraction scale. The obvious features of LGC didn't always point to a high level of abstraction of words. For instance, the average abstraction index of the word «*ukrepleniye*» (*fortification, strengthening; frontier)* is 2,8, although the word-formative criterion classifies this word as belonging to the LGC of abstractness.

When analyzing highly abstract words without any word-formative features, we also found out that elements of concreteness or collectiveness can be seen in the semantic structure of these nouns; in some meanings they can only be used in the plural. For example, the word «*sila*» (*power, energy)* has 13 meanings (Kuznetsov, 2000), and in its tenth meaning

(«A stratum of society acting according to its interests; a political, social or professional group marked by common interests, goals, ets.») this word can be included in the LGC of collectiveness; in the eleventh meaning it can only be used in the plural («Foot troops, naval, land or air forces») and is classified as a collective noun.

COCLUSION

Extra linguistic criteria are somewhat close to one of the semantic criteria that is representation of the word's dentate in the real world. according to this approach, all the words, which denote material objects, visible and tangible, are concrete, while the words referring to notions and things, which cannot be touched or sensed in any other way, are deemed abstract. however, these leaves out imaginary creatures (e.g. mermaid, unicorn, centaur), who are unanimously identified as concrete yet are not real or tangible (Khokhlova, 2014).

Let us summarize some of the results of our enquiries. Firstly, we can suggest that the rating of a word's abstractness/concreteness on a 5-point scale is largely influenced by the semantic criterion. The morphological criterion can only be applied to some lexical units for it can be found only in some lexico-semantic variations of the words, and most abstract words do not have such variations. Secondly, the results of our enquiries did not identify any lexical units with abstraction index from 4 to 5, which points to the fact that abstract words have a complex semantic structure which can have concrete components as well as components of collectiveness. Concrete nouns, however, are rated more definitely (Solovyev *et al*., 2019). Thirdly, the frequency of the word usage in some cases impacts their identification as concrete or abstract.

Unclear definition of abstraction and abstract words has long stood in the way of developing definite criteria for distinguishing abstract from concrete. Even nowadays, despite many research and developments, linguists define and identify abstract nouns in many different ways. The parameters, which may help identify those, can be characterized as either extra linguistic or linguistic, with the latter ones falling into semantic or formal. In this survey, we have attempted to conduct an examination based on a plausible method of generating a semantic dictionary of abstract words. Furthermore, we analyzed its initial outcomes, lexical units revealing a great level of abstraction among native speakers.

The described methodology for compiling a semantic dictionary of abstract vocabulary allows us to identify the degree of abstractness for each word, which will help to distinguish the LGR of abstract and specific words, regardless of the choice of the criterion for distinguishing between such vocabulary. An indication of the degree of abstractness of words will allow one to take into account both the phenomenon of polysemy and the complex semantic structure of some abstract nouns.

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