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Anthropocentric Turn in Linguistics Through the Digital Lens: Evidence from Analyses of Russian Mnemonic Verbs

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Abstract. The paper explores anthropocentric manifestations in both language and linguistic research. The research pursues a dual objective: firstly, to reconstruct the semantic field of verbs denoting mnemonic processes, considering taxonomical divisions into actions, processes and states; to specify the taxonomical status of the verb *помнить* (to remember) as a key verb in the cluster; and to analyze the manifestation of the + / – control semantic feature of these verbs. Secondly, to test the explanatory and research potential of three competing experimental formats: a human-based semantic experiment conducted through surveys of native speaker respondents; research engine-based experiments using Google and Bing search requests for word combinations where search engines function as a type of “collective respondent”; and the potential of neural networks for linguistic research. This approach combining three instrumental resources makes part of a fresh and innovative linguistic research procedure. The results of the research contribute to a more precise definition of the taxonomic specifics of the verb *помнить* (to remember) as an existential-resultative verb. The analyzed semantic cluster is described as divided into two semantic classes: “proper” memory verbs and their metaphorical semantic derivatives denoting speech acts. The behavior of these verbs concerning imperative forms and control features is also thoroughly analyzed.

Keywords: anthropocentric turn, semantic experiment, memory verbs, mnemonic processes, existential-resultative verb.

Research area: social structure, social institutions and processes. Russian language. The language of the Peoples of Russia.

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Антропоцентрический поворот в лингвистике сквозь призму цифровых технологий: анализ русских мнемических глаголов

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Аннотация. В настоящей статье рассматриваются элементы проявления антропоцентризма в естественном языке на уровне глагольной семантики, а также некоторые аспекты перехода к антропоцентрической парадигме в лингвистических исследованиях. Авторы ставят две цели: во-первых, представить семантическое поле глаголов, обозначающих процессы памяти, с учетом таксономического деления на действия, процессы и состояния; уточнить таксономический статус глагола “помнить” как ключевого глагола памяти; проанализировать проявление семантической характеристики контролируемости действия у глаголов памяти. Во-вторых, протестировать экспланаторный и исследовательский потенциал трех экспериментальных форматов: семантического эксперимента с привлечением носителей языка; экспериментов с обращением к поисковым системам Google и Bing, в которых поисковые системы выступают в роли “коллективного респондента”; и экспериментов с привлечением средств генеративного искусственного интеллекта – больших языковых моделей, прошедших обучение на массивах текстов на естественном языке. Использование комплексной методологии анализа, сочетающего семантический эксперимент, опору на сетевые технологии и работу с большими языковыми моделями, а также новые полученные описания мнемических глаголов, составляют новизну работы. Результаты исследования позволили получить более точное определение таксономических характеристик глагола “помнить” как экзистенциально-результативного глагола. В структуре анализируемого семантического кластера были выделены два семантических класса: собственно глаголы памяти и их метафорические производные, обозначающие речевые акты. Проверка глаголов памяти на употребление в императивных формах и выявление признака контролируемости действия позволили уточнить семантическое описание указанного глагольного кластера.

Ключевые слова: антропоцентрический поворот, семантический эксперимент, глаголы памяти, мнемические процессы, экзистенциально-результативный глагол.

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1. Introduction. Anthropocentric approach in semantic research

Anthropological turn in the 20th century science is reflected in anthropocentric

perspective in linguistics. Anthropological habitus of the word was accentuated as early as in P. Florenskii's and S.N. Bulgakov's philosophical discourse (Florenskii, 1990: 281, 293; Bulgakov,

1953: 24), supported by E. Benveniste declaring anthropocentric backbone of the language (Benveniste, 1974), to be followed by A. Peshkovskii's semantic description of preposition *за* (*behind*) with reference to the figure of an observer (Peshkovskii, 1957: 288). These ideas were supported in (Fillmore, 1981; Apresian 1995; Sulejmanova 2001), etc. (see the literature review in (Rakhilina, Testelet, 2016; Suleimanova, 1999: 66–76), with the research focus on lexical and syntactical means implying a human actor (recipient / observer / vantage point) as an inalienable participant of the state of affairs who registers what is going on around and reports to the text recipient. Crossdisciplinary studies relating the anthropological turn to visual and linguistic semiotics are now adding to this anthropocentric perspective (Suleimanova, Tivyaeva, 2023). It is the anthropocentric vector in linguistics together with cognitive studies that gave birth to cognitive linguistics which soon grew into the domineering linguistic paradigm (Potiakailo, 2022). We believe that the anthropocentric shift added to the emergence of cognitive linguistics.

Since pioneering works by A.M. Peshkovskii who introduced the figure of an implicit observer in whose perspective and through his eyes the semantics of preposition *за* (*behind*) is offered (Peshkovskii, 1956), references to the anthropocentric approach in research became a kind of *topos* (*Toposforschung*) scholars resort to in specifying the research perspective, in some cases without any substantiation with the practical data testifying to the human involvement in the event as a reference point.

We will try and focus on the variety of the latent anthropocentric means: these are **lexical markers**, e.g. the verbs of sense perceptions, such as *виднеться*, *показаться*, and others; prepositions (the statements below will be illustrated with examples taken from the Russian National Corpus (ruscorpora.ru) unless specified otherwise). Cf. English verbs of the same type *seem*, *appear*, which imply the figure of the implicit observer. Lexically represented, the observer has been given much attention, while **syntactic constructions** which imply this figure deserved less attention (Suleimanova, 1999; Pupylin, 1992). Impersonal

sentences denoting sense perception, either audial or visual or tactile often imply a person, an observer in whose perspective the state of affairs is featured: cf. *слышно, было видно, здесь холодно*, where the perceiver is not mentioned, though this person is the knowing eye. *При нас он позвонил в милицию: «Что у вас слышно?» – «Ничего».* *In front of us, he called the police headquarters: “Have you heard anything?” “None.”* (Russian National Corpus); ... *Не было слышно ни плача, ни крика. ... I couldn't hear any screaming or wailing* (Russian National Corpus); *Дверь открыта, и через проем видно, что люди идут и идут... останавливаются и молча смотрят на меня... The door was open, and through the doorway, I watched the people keep coming and coming... stopping there just to stare at me, speechless* (Russian National Corpus); *Если погода тихая... гладь... долго видно было, как они шли ко дну. If it was calm weather, a calm sea, you could watch them sinking for hours* (Russian National Corpus). Of special note here is the English translation when Russian impersonal sentences with the sense perception verb and the implicit observer call for a subject-predicate English proposition with the re-constructed explicit subject extracted from a wider context – it is either the *I* or *you* pronoun.

Cf. also *И слышно было до рассвета, как ликовал француз* (Borodino. M. Lermontov). – *And till the sunrise I could manage to hear French triumph* (translated by M. Baulina), vs. Googled translation with the formal subject of the passive verb: *it was heard until dawn how the Frenchmen rejoiced.* (Of note here is another typical English rendering pattern when the original Russian sentence with the implicit observer resorts to the semantically impersonal formal *it*-subject.)

It is not always clear in the original through whose eyes the scene is translated to the reader who is left guessing, while translating into English the translator has to contextualize and explicate the viewer, cf., e.g., the fragment from *Master and Margarita* by M. Bulgakov:

Грозу унесло без следа, и, аркой перегнувшись через всю Москву, стояла в небе разноцветная радуга, пила воду

из Москвы-реки. На высоте, на холме, между двумя рощами **виднелись** три темных силуэта – В воздухе **зашумело** ... – **видно** было, как в речном трамвае, проходившем мимо пристани, снесло у пассажиров несколько кепок в воду – *The storm was swept away without a trace, and, arching across the whole of Moscow, a multi-colored rainbow stood in the sky, drinking water from the Moskva River. At a height, on a hill, between two groves, three dark **silhouettes can be seen.** – **There was a noise** in the air ... – **it was seen** how in a river tram passing by the pier, several caps of passengers were blown into the water*, where the scene is built through the eye of the omniscient narrator (in this novel the observing narrator is practically omnipresent which makes the narrative most dynamic).

Basically, the anthropocentric perspective is also reflected in the cognitive metaphor where the human actor is the key domain which reframes the objects of a variety of target domains. In other words, the human actor is omnipresent in the language. The **research question** and the logic we pursue here is as follows: if the language is permeated by human perception, its investigation must be human-oriented as well, even in the methods applied.

We argue that research experimental procedures can be regarded as a further step towards the domineering anthropocentric linguistic paradigm.

The authors will focus on the anthropocentric approach towards semantic analysis of the words denoting cognitive processes of remembering represented in Russian verbs *помнить* and its derivatives, and *забывать*. Besides, we would like to test here the research with the experimental digital lens, i.e., the traditional semantic experiment supported by digital research engines, to be followed by neural network potential support, at least in the initial research phase.

This approach combining three instrumental resources makes part of a fresh and innovative linguistic research procedure while investigating lexical and syntactic semantics. As for the mnemonic verbs which constitute another goal pursued in the paper, the authors, relying on the suggested research design, offer

stricter definitions for the verbs in question, thus making the research innovative in this respect as well.

The research is grounded in corpus data from the Russian National Corpus (2023), supplemented by examples of statements retrieved through queries from Google and Bing resources. These sources are extensively utilized in contemporary cognitive studies to gather empirical material (Petrova, 2019; Suleimanova, Petrova, 2020; Tivyaeva, 2017; Morimoto, 2016, and others). The examined contexts were acquired through search operations employing keywords, with verbs representing fundamental memory processes and their derivatives serving as the focal points of this study.

2. Theoretical Framework

2.1. Prolegomena to Research:

Theoretical Background

Despite the fact that linguistics can offer comprehensive interpretations of memory representation, such as treating memory as lingua-cognitive system (Tivyaeva, 2017a, 2017b; Iskhakova, Khomiakova, 2009; Tarmaeva, 2010), relating memory to consciousness and thinking, remembering and reproducing mechanisms (Dmitrovskaja, 2001), semantic analysis of memory lexicon and remembering and forgetting (Amberber, 2007; Barancheeva, 2014; Kordi, 2020; Turovskii, 2001; Kubriakova, 2001), representation of memory in different languages (Tsentsner, 2012; Chertykova, 2014) it would be too early to say that, as of today, we see an integral exhaustive description of this conceptual field.

To render the research more compelling and to illustrate where and how the net can be instrumental, research-wise, the authors chose a most anthropocentric human domain representing the activities relating to memorizing and forgetting, i.e. Russian verbs representing mnemonic processes (MV) *помнить*, *вспоминать*, *запоминать* (*remember*, *recollect*, *reminisce*, *remind*, etc.) along with their derivatives, and *забыть* (*forget*). We agree with (Kubriakova, 2001) that human memory can be treated as a space, e.g. we can say *в моей памяти* (*in my memory*), *пришло на память* (*came to mind*, *из закоулков памяти* (*from*

the recesses of memory), *из глубин памяти* (*from the depths of memory*). Cf. also *All you have are the places in your memory that you can go to* (Me Before You, Jojo Moyes). *Gansey ran over the memory until he no longer felt the thrill of hearing Glendower's name whispered in his ear* (The Raven Cycle, M. Stiefvater). What follows is that there is a logical probability to either put into / retain in and download from this space some content, which is reflected in the choice of basic groups of verbs representing these acts: *запомнить* / *помнить* / *вспомнить* / *забыть* and their varieties conveying attendant circumstances. These can refer to *запоминать* representing the ongoing process of committing something to memory and often implying a continuous or repeated action of memorization as opposed to *запомнить*, which stands for the intentional act of committing something to memory. Another example is *позабыть* which is similar to *забыть*, the difference between the two lying in the fact that the latter indicates the loss or failure to recall while the former may accentuate a lack of care on the part of the subject with an emphasis on allowing something to fade from memory or neglecting to remember.

Taxonomically, the semantically cognate verbs of the same root can display substantial differences as to their characteristics as states, actions, processes which is reflected in their usage: *весел* (stative), *я веселюсь* (state as an activity), *я веселый* (property) (Shcherba, 1974: 90). Note that L.V. Shcherba (1974) related *state as an activity* to *states*. O.N. Seliverstova (1982) remarks that he seems to interpret *states* both as lexical meanings and as taxonomical meanings. We observe though that L.V. Shcherba does not define the term *state*, treating its interpretation as self-explaining, which makes a difference for our research. In many classifications the category of state involves all copula verbs, such as *love*, *hate*, *мне грустно*, *я студент*, *он курящий*, *я в пятом классе*, which can be challenged. O.N. Seliverstova (1982: 87–91) suggested well-elaborated criteria the *states* are to meet. In Shcherba's perspective MV *помнить* can be qualified as *state as an activity*, cf. also treating *помнить* as a predicate of *state* (Turovskii, 2001), while

it does not meet all of the requirements such predicates have to (see Seliverstova, 1982), and can be qualified as existential-resultative (экзистенциально-результативный). We will prove it below with these criteria and a series of tests.

Most of Russian memory verbs develop a metaphorical meaning denoting speech acts, such as **memorizing act – its verbal representation**, speech act, as a result of changing perception modality, cf. *напомнить*: *я напомнил ему его слова / его слова напомнили мне о моей ошибке* (*remind, I reminded him his words, his words reminded me of my mistake*); *вспомнить*: *вспоминай обо мне / он вспомнил (упомянул) о моем докладе в своей речи* (*remember, remember me, he mentioned my report in his speech*); *припомнить*: *Он припомнил мне мои слова / я припомнила* (*recall, he marked my words, I recalled*).

The **objective** of the paper focuses on semantics of verbs representing memory processes. It offers a kind of multilevel matrix hierarchy which covers higher categories: aspect, tense; the next level is taxonomy determined by criteria of process, action, property (quality), etc., and lexis. Special status of the semantic dominant in the memory verb *помнить* is analyzed. The second objective the authors chose to pursue is the focus on the research potential of digital research engines.

2.2. Linguistic experiment as a step towards anthropocentric research procedures

Cognitive linguistics with its strong focus on the cognitive abilities and their manifestations in the language treats the human being as the starting and finalizing actor of communication. This focus explains why research procedures are expected to involve active working human agents used in different capacities. We argue here that what does deserve attention is relating human-based research approaches to this paradigm, first and foremost, experimental procedures involving native speakers, digital engines “competing” with the human-operated experiment, to finalize the study with evaluating the research potential of neural networks for the linguistic research.

Table 1. Attributive word combinations (retrieved 04.01.2024)

Search engine inquiry	Google	Bing
красивая умная женщина	10 200	10 500
умная красивая женщина	9 800	9 670
красивая молодая женщина	2 110 000	91 800
молодая красивая женщина	1 670 000	38 100
a fat old woman	722 000	1 540 000
an old fat woman	714 000	680 000
healthy nourishing food	11 300	18 000
nourishing healthy food	8 290	20

We believe that the operating research procedures can be divided into at least two types with the reference to human agents involvement: analyzing the text as the final product, without the researcher's interference into text production, or the text-oriented approach, on the one hand, and the research involving the researcher's interference (changing the original text = experimenting with it). The point is that the changes can be researcher-dependent as well as digitally processed by the researcher. In other words, we, accordingly, distinguish three types of experiments, the first being rather "traditional", the one which implies a human participant (a native speaker who evaluates the suggested texts either as correct / incorrect (semantic experiment), or chooses the text (fragments) answering the suggested criteria (sociolinguistics), or offering the associations (psycholinguistics), etc.).

The semantic human-based experiment in our case was carried out according to well-elaborated requirements (see Scherba 1974; Suleimanova 1999), i.e. native speakers were asked to estimate the suggested utterances—either taken from the corpora or generated by the researcher in accordance with the hypothesis—with reference to the norms of the language. Seven informants were involved, which is proved sufficient for the semantic experiment (contrary to, say, psycholinguistic ones which call for many more respondents). The semantic experiment engages the informants who have to answer the criteria to follow: they have to have a degree in humanities and work as professional editors, professors and post graduates in linguistics.

In our experiment, for example, we claim that the verb *упомнить* conveys the information that the action is not controlled which implies that it should not co-occur with the imperative. We generate the sentences with this verb in the imperative form, e.g. **постарайся упомянуть то, что я тебе скажу*, which is estimated by all the informants as incorrect. What follows is that this activity cannot be controlled, and the hypothesis is valid. All the verbs underwent this procedure (the authors as native speakers can also take part in the experiment, and this introspection cannot be challenged as the researcher has the right to deem the sentence as either correct or incorrect, like other informants).

All of these involve a human actor, an informant. The second type, a relative newcomer to linguistic research procedures, is search engines which can work as a "collective" informant, e.g., the researcher may be interested in the variations of the word order (WO) in the attributive group, which is presumably indicative of the culturally relevant preferences. In this case the competing combinations are googled, the resulting statistics testifies to the acceptability / unacceptability of the text fragment, besides, it makes prominent cultural or individual preferences. Take, for example, two attributive groups *a fat old lady* vs *an old fat lady* and corresponding Russian word combinations. We can make several important claims concerning these units. First, we have to challenge the views concerning WO rules in a variety of textbooks which have the bragging right! Both of the phrases *a fat old lady*

/ *an old fat lady*, or *healthy nourishing food* / *nourishing healthy food* contradict each other, i.e., some claim that the attributes must abide by the rule while others believe in another WO (Suleimanova, Petrova 2020), and both are acceptable. We rely here on the theory of classes which states that the attribute preceding the noun defines the subclass of objects the given object belongs to while the second-to-left attribute further narrows the subclass: *a girl* – *a beautiful girl* – *a smart beautiful girl* finally reduces the class of reference. The hypotheses the authors pursued was that the closest-to-the-noun attribute defines a **most culturally relevant** subclass of objects in case it is the most frequent in big databases. The second point is that the above pairs are different statistics-wise. Cf. also Russian utterances *красивая умная женщина* vs *умная красивая женщина*, *молодая красивая женщина* vs *красивая молодая женщина*. See Table 1 above.

The data from Table 1 empower the researcher to claim that for the Russian world picture the features *умная* (according to both resources) vs *красивая*, and *молодая* vs *красивая* in women are only slightly more relevant, but the regular correlations between two search engines, when *красивая умная* and *умная красивая* are proportionally related to each other, signals about stable-though almost 4 % negligible – difference in cultural perceptions. True it is that the language often registers the oncoming tendencies, and we may face here such a trend towards the equality features. What concerns another pair with *красивая молодая* vs *молодая красивая*, the proportion within Google data and Bing data pairs is practically similar, though the absolute numbers are different.

It should be noted, however, that there are certain discrepancies observed in the results returned by Google and Bing. While figures 10,200 and 10,500 standing for *красивая умная женщина* are quite adequate, the spread between the number of occurrences for *nourishing healthy food* returned by Google and Bing may be a brow raiser. At a closer look, there is nothing misleading about the results as the two search engines employ different web indexing and crawling algorithms, the former

indexing hundreds of billions of webpages and the latter covering between 8 to 14 billion web pages. What is important is that the results returned by both Google and Bing still testify to the authors' hypothesis concerning the culturally determined preferences.

This experiment can be combined with the previous procedure, thus forming triangulation verification of the hypothesis. In such cases when the same result is achieved through applying different research methods the final result is more compelling and can be fully relied on. In other words, here again notwithstanding digital form the human actor who is setting / generating the experimental sampling and stating the task is involved.

Proceed to the number three research method, that can add to the two above ones. It is an absolute newcomer to the cognitive semantics research field whose research potential is waiting to be evaluated while in other avenues of language studies it has already proven to be efficient (see, for instance, Dynel, 2023; Lin, 2023; Schwitzgebel et al. 2023; Curry et al., 2024). In this study neural networks were used as a “collective” informant as they rely on large language models pre-trained on vast numbers of text documents and operating on the basis of their knowledge about semantic and syntactic relations inherent in human language corpora. As large language models have access to large text arrays and process statistically significant data on relations between language units, they can potentially generate more or less reliable conclusions about the use of language elements, although one should be aware of their limitations and possible risks as shown in (Sobieszek, Price, 2022; Alawida et al., 2023; Spitale et al., 2023).

We suggest, though, referring to generative artificial intelligence tools at the initial stage of research and retrieving relevant data can be insightful to a certain extent.

3. Research Methods

The research methods we practice hit two goals: they are relied on in determining the word meaning (the object is the MV *помнить*), besides, they make, at the same time, the research subject-matter themselves, their explan-

atory potential is tested. We will start with evaluating potential of imperative tests, then proceed to testing the MVs through double digital lens – search engines and large language models.

4. Results and discussion

4.1. Imperative as a semantic testing instrument

Why opting for this particular test variety?

We argue that this test is one of the most indicative as it helps define verb categorial semantics and reveal + / – **control** feature in the word semantics, which enables the researcher to outline the role of the protagonist as regards his activity and predicate categorial semantics (see details in Table 2 below). +**Control** launches memorizing *вспоминай, запоминай, помни, забудь* and even *?припоминай (?постарайся припомнить)*, or realize it *вспомни, запомни*. –**Control** prevents launching **упомни, *упоминай не забудь*, or interfering with the process, or perfect forms: **не помни, *не вспомни, *не запомни, не припомни, не упомни*, but allows warning: *не забывай об этом*.

This negative imperative tests positive with speech acts in imperfect forms

не вспоминай, and negative in perfect forms **не вспомни*. True it is that one can stimulate into action using positive perfect imperative, but it is impossible to control the result **не запомни; не упоминай –*не упомни; не припоминай –*не припомни; не напоминай – *не напомни*.

In other words, aspect features together with lexical semantics take their toll on the verb behavior in negative imperative (this test and results interpretation are shown in Table 2 below).

4.2. Taxonomical Profiling of MVs:

relating to the time axis

The MV focuses on a variety of the characteristics of the mnemonic process, the verbs morph into semantic oppositions to form a matrix of crisscrossing and overlapping oppositions, with the key criteria relating to how the verb behaves with the reference to the time axis: either it develops in the time (acts), or not (processes, states, etc.). This characteristic is in its turn manifested through a variety of criteria, such as +/- **control** feature, for example.

We will be distinguishing properties (qualities), activities, processes and abide by

Table 2. Testing memory verbs in imperative form

Verb aspect	Verb	Positive Imperative	Negative Imperative
Perfect	Вспомнить	Вспомни	*Не вспомни
Imperfect	Вспоминать	Вспоминай	? Не вспоминай
	Speech act	<i>вспоминай / вспомни</i>	<i>не вспоминай / *не вспомни</i>
Perfect	Запомнить	Запомни	*Не запомни
Imperfect	Запоминать	Запоминай	*Не запоминай
Perfect	Напомнить	*Напомни	*Не напомни
Imperfect	Напоминать	Напоминай	Не напоминай
	Speech act	<i>Напоминай</i>	<i>Не напоминай / не напомни</i>
Perfect	Припомнить	Припомни	*Не припомни
Imperfect	Припоминать	Припоминай	? Не припоминай
	Speech act	<i>Припомни</i>	<i>*Не припомни</i>
???	Помнить	Помни	*Не помни
Perfect	Забывать	Забудь	Не забудь
Imperfect	Забывать	*Забывай	Не забывай

a more strict interpretation of states. We do admit though that *помнить* displays some features typical of states: it cannot be used in answering the questions of the type *What are you doing?* – **сиджу и помню* (**I am sitting and remembering*). **стараюсь помнить*. *Что ты делал вчера в 7 вечера* – **сидел и помнил / *забывал* (cf. active predicate *сидел и вспоминал*). Cf. though *сиджу и вспоминаю / *запоминаю / стараюсь / пытаюсь вспомнить / припомнить / запомнить* (*sitting and trying to recall*), where the predicates convey actions, the doers apply some force to realizing the actions.

States do not accept perfect forms and do not obey the **+control** feature: **будь грустным*. *Что он сделал?* –? *Просто помнил об этом и ничего не сделал*.

Note though that most MVs can represent an event as **+control**, at least at one of the moments / stages: *вспомни, забудь, запомни, запоминай* and even *помни*. Meanwhile, not all of them can accept the negative imperative – *не забудь, не забывай, не упоминай, *не помни об этом, ?не запоминай*. (It is possible to say *не помни зла*, where the idiomatic word combination is used as a kind of warning to the listener (Birulin 1994, 105)). They are, as well as speech acts, actions in the imperfect forms, and results in the perfect form. What follows is the ability of perfect forms to qualify the event as a momentary achievement of results, which is manifested in the inability of MV to combine with adverbs denoting degree and measure, for they characterize the event as developing in time / measure dimensions: **немного / *очень забыть* (Turovskii, 2001), cf. **немного вспомнить и запомнить*.

In other words, MVs engage in lexical oppositions, on the one hand, which are superimposed on the opposition memory vs speech act, and the aspectual characteristics. This matrix is supplemented by the relations towards the time axis.

4.3. Semantics of *помнить*

The key MV is *помнить*, it is a yeomen of the memory lanes and supports and guards the memory space, while other verbs denote

onetime entrances and exits into and from the memory space. It is an existential-result predicate, which is supported by its usage: it is not used in the perfect form, does not combine with adverbs which indicate application of the force **Я напряженно помнил, или *он с горечью / радостью помнил vs вспоминал*. Nor does it denote momentary actions, cf. **помнить один момент*, though it is possible to say *он помнил об этом всего одну минуту и тут же забыл*, where the state of affairs is conceived as not quite normal due to the word *всего*. Other possible intensifiers *только, всего, даже* also signal about deviations and can break the ban on *помнить* combining with adverbs / particles denoting a momentary action.

Помнить does not represent repeated iterative actions: **он помнил об этом время от времени – вспоминал время от времени* (**помнил всего всю жизнь*). Besides, this predicate is used with the positive imperative *помни меня (вспоминай обо мне), помни, что я тебе говорила* and, on the contrary, does not admit a negative imperative **не помни*.

To sum it up, the reminiscing subject possesses the knowledge which was generated as a result of memorizing; the resulting knowledge is saved in the reminiscing subject's conscience: *Лето семнадцатого года помню как начало какой-то тяжелой болезни, когда уже чувствуешь, что болен, что голова горит, мысли путаются, окружающее приобретает какую-то жуткую сущность, но когда еще держишься на ногах и чего-то еще ждешь в горячем напряжении всех последних телесных и душевных сил* (*Cursed Days. I. Bunin*). – *I remember the summer of the seventeenth year as the beginning of some serious illness, when you already feel that you are sick, that your head is burning, your thoughts are confused, the environment acquires some kind of terrible essence, but when you are still on your feet and waiting for something else in the feverish tension of all the last bodily and mental forces*.

4.4. Digital profiling potential

As one of the fundamental principles of the scientific method is experiment reproduc-

Table 3. Google Experiment Results

Verb	Positive imperative	Returned results	Negative imperative	Returned results
Вспомнить	Вспомни	3 830 000	Не вспомни	8 580
Вспоминать	Вспоминай	1 260 000	Не вспоминай	434 000
Запомнить	Запомни	17 300 000	Не запомни	4 810
Запоминать	Запоминай	782 000	Не запоминай	13 700
Напомнить	Напомни	1 830 000	Не напомни	2 910
Напоминать	Напоминай	214 000	Не напоминай	99 800
Припомнить	Припомни	1 130 000	Не припомни	2 220
Припоминать	Припоминай	12 100	Не припоминай	2 380
Помнить	Помни	12 600 000	Не помни	451 000
Забудь	Забудь	14 000 000	Не забудь	15 700 000
Забывать	Забывай	6 260 000	Не забывай	6 770 000

ibility, which refers to the ability to replicate and reproduce the results of a scientific experiment, it is important to check whether similar or identical results will be obtained if the experiment is reproduced with the same empirical data and search queries but under different sources of language data. This threefold approach is meant to enhance the credibility of the results and contributes to the overall reliability of the conclusions made by the authors.

We will try and assess the explanatory potential of digital engines as compared to human involvement.

Experiment 1. Native Speakers

First we refer to native speakers as a verification instrument, as a reference, an absolute judgement (which will be complemented with the digital procedure results available in the next step – Experiments 2 and 3).

What the experiment revealed:

– Speech acts take on both positive and negative, and perfect and imperfect forms

напомни / напоминай мне об этом почаще, больше никогда не напоминай мне об этом.

– Perfect positive is valid both for speech acts and MV: *забудь об этом, вспомни, где ты вчера его встретил, ваша речь напомнила мне слова ученого, попомни мои слова, напомни, пожалуйста, мне. (Напомнить is*

an exception, but the ban is accounted for by the fact that formally the sentence subject represents an “agent” who / which does not apply any force to realize the action in the memory of the reminiscing subject, it does it due to its internal characteristic. – *Петя напомнил мне тебя в молодости. Эта картина напомнила мне мое детство.*

– Negative imperfect imperative which requests to stop a +**control** action (Birulin, 1994) allows for +**control** verbs only *не читай / поминай его имя все, не забывай, не вспоминай об этом* (in the latter case we observe ambiguity due to two possible interpretations: either a direct or metaphorical meaning, or both as we may mean a cognitive effort, or an attendant speech act).

– Negative perfect imperative is a warning alerting the recipient against some +**control** act (Birulin, 1994: 105), it allows for verbs *не забудь, постарайся не забыть* (efforts are applied), and bans **не вспомни / припомни / упомни*, which feature **-control**.

The analyzed verbs enjoy a variety of degrees of control: imperfect implies potential interference into the process (it explains incorrect **забывай*), while the warning is correct *не забывай*. In offers a valuable prognostic instrument, it will be relied on in its explanatory potential both in Experiment 1 with participation of native speakers and in Experiment 2 based on digital resources.

Experiment 2. Research engines

While in the first step of the research procedure, the tests were run with native speakers, in the second experiment the same search queries were addressed to Google. The relevant results including numbers were then processed and analyzed. The Table 3 above features results obtained for the listed key words (retrieved on November 27, 2023).

While some of the results returned by Google may seem contradicting to the results of the first experiment, there is no contradiction here as the minor differences that were registered in the queries returned from native speakers and from Google (for instance, for **не вспомни*) can be neglected. Allowances should be made for Google algorithms that include into results samples that can be grammatically unacceptable, e.g. *Я убью себя, И никто меня не вспомни его жена о паспорте на имя Шмашковского, так бы и продолжал Успенский жить в какой-нибудь тихой заводи* or are stylistically marked, e.g. *Махаоны летят на запад, Если дует с востока ветер. Если жемчуг в моей ладони, Если бьются о сердце волны, Если ты меня тоже понял, Забывай меня и не вспомни!* The same is true for **не запомни* which, except for a number of irrelevant contexts, can be used in stylistically marked sentences, supported by the particle *поди*, meaning *попробуй (try to)*: e.g. *Словом, этот мальчик запомнился хорошо, да поди не запомни такого открытого и улыбочивого ребёнка; А поди меня не запомни с таким рыжим Лёней!*

The corollary runs as follows: Google is very helpful in semantic research, especially when big statistics comes into play, though statistically marginal data cannot be completely trusted. Still, the human check is always a must, and the corrections should tackle the points to follow: since it is impossible to distinguish meanings in polysemantic words, second, the human check of big data is impossible, so linguistics faces the problem of suggesting formal contextual criteria which will signal which of the meanings is realized in each particular case. This is an outstanding issue. In our case two clearly different meanings – that of a

speech act and MV – are not distinguished, and what the obtained figures represent is the number of the words forms only. That is why Table 3 is less informative than Table 2, and the line referring to specifically speech acts is missing.

Experiment 3. Neural Networks

In Experiment 3 the same queries were addressed to ChatGPT 3.5 – a product of OpenAI’s GPT 3.5 language model which is trained to generate human-like text. The following request was addressed to ChatGPT 3.5: *We are doing research on memory verbs in Russian. Can you help and say whether the following verb forms are allowed in Russian or not. Comments will be appreciated.*

Table 4 is understandably even less informative than Table 3, for a variety of reasons. First, Google, as well as text corpora, does not generate texts. Both rely on what was produced by others, while neural networks operate on the rules they deduce from large textual data and generate their own texts. It explains why all of the MVs are assessed as acceptable. The neural network does not offer any – extremely precious for a linguist – “negative language material” (Shcherba, 1974), which is crucial for experimental linguistic research. Second, the explanations ChatGPT generated focus on very general characteristics: they state that the negative / positive imperatives are valid in Russian, singular or plural, used when addressing one or many people, specify the degree of formality. For instance: ***Не вспомни** is the singular, informal negated imperative form. It is used when addressing one person informally, or **Не вспоминай** is the singular, formal or plural negated imperative form. It can be used when addressing one person formally (using the polite “вы” form) or when addressing multiple people.* (The authors changed in all quotations here and below bracketed orthography “не вспоминай” into bold type **не вспоминай**.)

Occasionally ChatGPT 3.5 declares that “the choice between them depends on the context and the level of formality in the communication” (OpenAI, 2023).

The same results were returned for **не запомни / *не запоминай* and **не напomini / *не напоминай*: *The phrases **не запомни** and*

Table 4. ChatGPT 3.5 Results

Verb	Positive imperative	ChatGPT 3.5 data	Negative imperative	ChatGPT 3.5 data
Вспомнить	Вспомни	Acceptable	Не вспомни	Acceptable
Вспоминать	Вспоминай	Acceptable	Не вспоминай	Acceptable
Запомнить	Запомни	Acceptable	Не запомни	Acceptable
Запоминать	Запоминай	Acceptable	Не запоминай	Acceptable
Напомнить	Напомни	Acceptable	Не напомни	Acceptable
Напоминать	Напоминай	Acceptable	Не напоминай	Acceptable
Припомнить	Припомни	Acceptable	Не припомни	Acceptable
Припоминать	Припоминай	Acceptable	Не припоминай	Acceptable
Помнить	Помни	Acceptable	Не помни	Acceptable
Забуть	Забудь	Acceptable	Не забудь	Acceptable
Забывать	Забывай	Acceptable	Не забывай	Acceptable

не запоминай are both valid in Russian. They are negated forms of the imperative, meaning “do not memorize” or “don’t commit to memory”.

Cf. two more descriptions: **Не запомни** is the singular, informal negated imperative form. It is used when addressing one person informally. **Не запоминай** is the singular, formal or plural negated imperative form. It can be used when addressing one person formally (using the polite “вы” form) or when addressing multiple people. These forms are suitable for instructing someone not to memorize or commit something to memory, and the choice between them depends on the context and the level of formality in the communication (OpenAI, 2023).

The comments for the rest of the tested verbs were also generated in the same key, no distinguishing features were voiced.

Below is the dialogue between the authors and ChatGPT 3.5 on assessing the validity of verb forms:

Authors: How do you decide whether it is a valid or an invalid verb form?

ChatGPT 3.5: I determine the validity of verb forms based on the rules of the Russian language. Valid verb forms conform to the grammatical and syntactical rules, conjugation patterns, and usage norms of the Russian language. I don’t have specific information about every possible verb form, but I can gen-

erate responses based on the general knowledge I’ve acquired during training.

If you provide a specific verb form or phrase, I can analyze it based on my understanding of the Russian language and offer guidance or corrections. Keep in mind that while I can provide information and assistance, it’s always a good idea to consult with a native speaker, language expert, or language reference materials for precise and detailed language analysis. Language usage can be nuanced, and context plays a crucial role in determining appropriateness (OpenAI, 2023).

So, the wheel has come full circle, as William Shakespeare put it, and ChatGPT 3.5 suggested in the final perspective turning to the epitome of anthropocentricity – human being as the ultimate truth.

Still, we should not underestimate the potential of employing large language models in linguistic research. The perspective is to critically analyze what they can offer and make the best use of them.

5. Conclusions

Linguistics nowadays is working hard trying to arrange its research potential into comprehensive algorithms, adding new promising instruments and technologies into its savings box (Suleimanova, Guliiants, 2022). It is quite evident that digital engines promise much in this line, the point is that scholars have to find

ways how to tailor the technological innovations into linguistic research practices. We will lay our hopes here on the most technologically savvy individuals dealing in cross-disciplinary research, providing them with road maps and explaining how language works so that they could formalize the intricate linguistic rules and ways. To do that, we have to analyze semantics as the *prima facie* of the language. In this paper the authors try to analyze semantic structures of a very complicated verb cluster referring to the cognitive field and its functioning which is not visible or observable: a matrix of planes relating to taxonomical dimension of actions / processes / states was constructed, sending the previously qualified as *state* key MV *помнить* into another cell, defining it as an existential-resultative verb and substantiating these findings experimentally. The semantic experiment was supplemented with

a test, based on imperative forms, varying tense, aspect characteristics and thus revealing + / – control features in the verb semantics. Three possible experimental resources were compared with respect to their research and explanatory potential, one of them being a complete newcomer to the linguistic research field, i.e. neural networks. Their potential was tested and evaluated, the perspective outlined, which calls for special formats to be suggested in future. The wheel has come full circle. We started with human-based experiments which yield quite compelling results, proceeded to digital search and research engines, such as Google, and stopped at the moment at artificial intelligence which in its turn suggested turning to a human as the ultimate truth in explaining linguistic data. It makes us conclude that there is much to be done to make use of such promising sources.

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