Triangulation as a Research Method in Experimental Linguistics

Olga Suleimanova[1[0000-0002-4972-0338]] and Marina Fomina[2[0000-0002-1771-6334]] ✉

[1] Moscow City University, Moscow 129226, Russia
olgasoul@rambler.ru
[2] Moscow City University, Moscow 129226, Russia
marinafomina7@gmail.com

Abstract. The paper focuses on the complex research procedure based on hypothesis-deduction method (with semantic experiment as its integral part), corpus-based experiment, and the analysis of search engine results. The process of verification that increases validity of research findings by incorporating several methods in the study of the same phenomenon is often referred to as triangulation. Triangulation being a well-established practice in social sciences is relatively recent in linguistics.

The authors describe a step-by-step semantic research technique employed while studying semantic features of the group of English synonymous adjectives – *empty, free, blank, unoccupied, spare, vacant* and *void*. The preliminary stage of the research into the meaning of the adjectives consists in gathering information on their distribution, valence characteristics and all possible contexts they may occur in. The results of this preliminary analysis enable to frame a hypothesis on the meaning of the linguistic units. Then the authors proceed to the experimental verification of the proposed hypotheses supported by corpus-based experiment, the analysis of search engine results, and mathematical-statistical methods and procedures that can help separate the random factor from the informants' grade determined by the system of language. The research findings result in stricter semantic descriptions of the adjectives.

Keywords: Triangulation, Linguistic Experiment, Corpus-based Experiment, Expert Evaluation Method, Mathematical Statistics, Informant, Semantics.

1 Introduction

Triangulation is regarded as a process of verification that increases validity of research findings by incorporating several methods in the study of the same phenomenon in interdisciplinary research. The proponents of this method claim that "by combining multiple observers, theories, methods, and empirical materials, researchers can hope to overcome the weakness or intrinsic biases and the problems that come from single-method, single-observer, single-theory studies" [1]. In 1959, D. Campbell and D. Fiskel advocated an approach to assessing the construct validity of a set of measures in a study [2]. This method that relied on a matrix ('multitrait-multimethod matrix') of intercorrelations among tests representing at least two traits, each measured by at least two methods, can be viewed as a prototype of the triangulation technique.

In social sciences, N. Denzin distinguishes between the following triangulation techniques:
- data triangulation (the researcher collects data from a number of different sources to form one body of data);
- investigator triangulation (there are several independent researchers who collect and then interpret the data);
- theoretical triangulation (the researcher interprets the data relying on more than one theory as a starting point);
- methodological triangulation (the researcher relies on more than one research method or data collection technique) which is the most commonly used technique [3].

Triangulation being a well-established practice in social sciences (e.g. see [1], [2], [3], [4], [5] and many others) is relatively recent in linguistics. The 1972 study by W. Labov states the 'complementary principle' and the 'principle of convergence' among the key principles of linguistic methodology that govern the gathering of empirical data [6]. W. Labov stresses the importance of triangulation principles in linguistics arguing that "the most effective way in which convergence can be achieved is to approach a single problem with different methods, with complementary sources of error" [6].

Modern verification procedures and experimental practices are steadily narrowing the gap between linguistics (as an originally descriptive science relying mostly on qualitative methods in studying linguistic phenomena) and exact sciences. The results of linguistic research get the status of tested and proved theories and established laws. In addition to well-known research procedures, the linguistic experiment, being entirely based on interviews with native speakers (often referred to as 'informants'), is rapidly getting ground (see [7] for a detailed account of verification capacity of semantic experiment).

Recent years have witnessed a significant rise in the number of corpus-based experimental studies. Many linguists support their research procedure by the analysis of search engine results (e.g. Google results).

In the paper, we shall focus on verification procedures that rely on the methodological triangulation when experimental practices are supported by corpus-based experiment, the analysis of search engine results, and mathematical-statistical methods.

2 Methodology

2.1 Semantic Research and Experiment

The semantic experiment is an integral, indispensable part of the complex research procedure often referred to as hypothesis-deduction method. J.S. Stepanov distinguishes the four basic steps of hypothesis-deduction method: 1) to collect practical data and provide its preliminary analysis; 2) to put forward a hypothesis to support the practical data and relate the hypothesis to other existing theories; 3) to deduce rules from the suggested theories; 4) to verify the theory by relating the deduced rules to the linguistic facts [8].

Following the steps, O.S. Belaichuk worked out a step-by-step procedure of semantic experiment [9]. Let us demonstrate how it works on the semantic analysis of the meanings of English adjectives *empty, free, blank, unoccupied, spare, vacant* and *void* [10].

The preliminary stage of semantic research into the meaning of a language unit consists in gathering information on its distribution, valence characteristics and all possible contexts it may occur in. The results of this preliminary analysis enable the researcher to frame a hypothesis on the meaning of the linguistic unit in question (see [7] for a detailed description of the step-by-step procedure).

At the next stage, we arrange a representative sampling by reducing the practically infinite sampling to a workable set. Then an original word in the representative sampling is substituted by its synonym. For example, in the original sentence *The waiter conducted two unsteady businessmen to the **empty table** beside them* [11] the word *empty* is replaced by the adjective *vacant: The waiter conducted two unsteady businessmen to the **vacant table** beside them.* Then other synonyms − *free, blank, spare, unoccupied* and *void* − are also put in the same context. At this stage, we may not have any hypothesis explaining the difference in the meanings of the given adjectives.

At the next stage of the linguistic experiment, informants grade the acceptability of the offered utterances in the experimental sample according to a given scale suggested by A. Timberlake [12] − consider a fragment of a questionnaire (see Fig. 1) used in the interview of native speakers of English [13].

QUESTIONNAIRE

Name: ________________________________
Nationality: ____________________________
Age: __________________________________
Qualifications: __________________________

<u>*DIRECTIONS*</u>

Grade each of the sentences below according to the following scale:

Rating	**Meaning**	**Comment**
1	Unacceptable	Not occurring
2	Marginally acceptable	Rare
3	Not preferred	Infrequent
4	Acceptable, not preferred	Frequent

5	Acceptable, preferred	Most frequent

NOTE: Grade sentences with reference to the norm of standard English (slang, vernacular, argot or stylistically marked words are not in the focus of investigation)

Useful hints to prevent possible misapprehension

! *Do not try to assess the degree of synonymy of the words analysed*

! *Do not develop possible contexts that may seem to be implied by the words used in the statements; assess the acceptability of the utterances judging by the way the information is presented*

! *Still if you feel that the context is insufficient to assess the acceptability of the sentence, suggest your own context in the column "comments" corresponding to the sentence (A-G). Then grade the utterance according to the context offered by you*

Any of your comments will be highly appreciated!

	Sentence	Rating	Comments
A	*The room is empty. All the furniture has been removed.*		
B	*The room is free. All the furniture has been removed.*		
C	*The room is blank. All the furniture has been removed.*		
D	*The room is spare. All the furniture has been removed.*		
E	*The room is unoccupied. All the furniture has been removed.*		
F	*The room is vacant. All the furniture has been removed.*		
G	*The room is void. All the furniture has been removed.*		

THANK YOU.

Fig. 1. Questionnaire (a fragment).

Then the linguist processes and analyses the informants' grades to put forward a linguistic hypothesis, and then proceeds to the experimental verification of the proposed hypotheses.

There is a variety of tests for verifying hypotheses, e.g. when the researcher varies only one parameter of the situation described while others should be fixed and invariable (see [7], [14], [15], [16]) for the detailed account of verification procedures).

In addition to the well-established verification procedures employed in the linguistic experiment, corpus-based experiment and the analysis of search engine results are rapidly getting ground.

Researchers claim that these new IT tools give a linguist value added: text corpora as well as such search engines as Google provide invaluable data, though they remain underestimated, and have not been explored as regards their full potential [17]. While in linguistic experiment we obtain the so-called ‘negative linguistic material’ (the term used by L.V. Scherba), i.e. the sentences graded as unacceptable, the text corpora does not provide the researcher with marked sentences. Most frequently occurring search results are likely to be acceptable and preferred, while marginally acceptable and not preferred sentences are to be rare. To verify the hypothesis with corpora and Google big data, the researcher determines whether the corpora and Google experimental data complies with his/her predictions and expectations, and to what extent. So, in accordance with the expectations we get frequent search results with the word *empty* describing a physical object (a bottle, a box, a table, a room, etc.) construed as three-dimensional physical space; and rare or no results with the word *blank* in these adjective-noun-combinations (see Table 1).

Table 1. BNC and Google search results.

	bottle (BNC / Google)	**box** (BNC / Google)	**table** (BNC / Google)	**wall** (BNC / Google)	**screen** (BNC / Google)	**sheet of paper** (BNC / Google)
empty	4.97 m / 32	3.98 m / 19	1.33 m / 15	2.4 m / 2	0.381 m / 2	0.665 / 1
blank	0.156 m / **0**	0.654 m / **0**	0.305 m / **0**	4.92 m / 38	4.13 m / 12	1.68 m / 20

2.2 Expert Evaluation Method in Linguistic Experiment

While grading the sentences the informant is governed by the language rules and regulations as well as by some random factors. Thus, each grade being the result of deterministic and random processes can be treated as a variate (not to confuse with a ‘variable’). In the linguistic experiment, this variate (X) can take on only integer values on the closed interval [1; 5] (five-point system). Therefore, it should be referred to as a discrete variate.

Discrete variates can be processed by mathematical-statistical methods. We chose several statistics that best describe such random distributions.

The first one is *the expectation* for each sentence, or − in other words − *the mean value* of grades. The expectation corresponds to the centre of a distribution. Thus, it can be interpreted as a numerical expression of the influence of deterministic factors. This characteristic is defined as

$$\mu_i = \frac{1}{m}\sum_{j=1}^{m} \chi_{ij} \ (i = 1, 2, \dots, n) \quad (1)$$

where μ_i is the mean value (the expectation) of grades for the i^{th} sentence;
i is a sentence number ($i = 1, 2, \dots, n$);
j is an informant's number ($j = 1, 2, \dots, m$);
n is the total number of sentences;
m is the total number of informants;
χ_{ij} is the i^{th} sentence's grade given by the j^{th} informant ($\chi_{ij} = 1 \div 5$).

The second characteristic is *the dispersion*. It defines the extent the grades are spread around their mean value. It means that the dispersion is a numerical expression of the influence of random factors. The lower the dispersion of the grade, the more reliable the grade is (the influence of random factors is lower), and vice versa. If the dispersion is high, the researcher should try and find possible reasons which might have led to this value. This statistic can be calculated with (2):

$$D_i = \frac{1}{m}\sum_{j=1}^{m}(\chi_{ij} - \mu_i)^2 \ (i = 1, 2, \dots, n) \quad (2)$$

where D_i is the dispersion of grades for the i^{th} sentence;
μ_i is the mean value (the expectation) of grades for the i^{th} sentence;

i is a sentence number ($i = 1, 2, \dots, n$);
j is an informant's number ($j = 1, 2, \dots, m$);
n is the total number of sentences;
m is the total number of informants;
χ_{ij} is the i^{th} sentence's grade given by the j^{th} informant ($\chi_{ij} = 1 \div 5$).

The next step of the algorithm is calculating *the mean value* for each sentence taking into account *the competence of informants* (3). The measure of competence of an informant can be expressed via *the coefficient of competence* which is a standardized value and can take on any value on the interval (0; 1). The sum of the coefficients of the whole group of informants is to amount to 1 (4).

These coefficients can be calculated a posteriori, after the interview. We proceed from the assumption that informants' competence should be estimated in terms of the extent to which each informant's grade agrees with the mean value [13].

$$\chi_i = \sum_{j=1}^{m}\chi_{ij}\kappa_j \ (i = 1, 2, \dots, n) \quad (3)$$

where χ_i is the mean value of grades for the i^{th} sentence;
i is a sentence number ($i = 1, 2, \dots, n$);
j is an informant's number ($j = 1, 2, \dots, m$);
n is the total number of sentences;
m is the total number of informants;
χ_{ij} is the i^{th} sentence's grade given by the j^{th} informant ($\chi_{ij} = 1 \div 5$);
κ_j is the coefficient of competence for the j^{th} informant, the coefficient of competence being a standardized value, i.e.

$$\sum_{j=1}^{m} \kappa_j = 1 \tag{4}$$

The coefficients of competence can be calculated with recurrence formulas (5), (6) and (7):

$$\chi_i^t = \sum_{j=1}^{m} \chi_{ij} \kappa_j^{t-1} (i = 1, 2, \ldots, n) \tag{5}$$

$$\lambda^t = \sum_{i=1}^{n} \sum_{j=1}^{m} \chi_{ij} \chi_i^t \; (t = 1, 2, \ldots) \tag{6}$$

$$\kappa_j^t = \frac{1}{\lambda^t} \sum_{i=1}^{n} \chi_{ij} \chi_i^t ; \sum_{j=1}^{m} k_j^t = 1 \; (j = 1, 2, \ldots, m) \tag{7}$$

We start our calculations with $t = 1$. In (5) the initial values of the competence coefficients are assumed to be equal and take the value of $\kappa_j^0 = {}^{1}\!/_{m}$. Then, the cluster estimate for the i^{th} sentence in the first approximation (expressed in terms of (5)) is therefore:

$$\chi_i^1 = \frac{1}{m} \sum_{j=1}^{m} \chi_{ij} \; (i = 1, 2, \ldots, n) \tag{8}$$

λ^1 can be obtained using (6):

$$\lambda^1 = \sum_{i=1}^{n} \sum_{j=1}^{m} \chi_{ij} \chi_i^1 \tag{9}$$

The coefficients of competence in the first approximation are calculated according to (7):

$$\kappa_j^1 = \frac{1}{\lambda^1} \sum_{i=1}^{n} \chi_{ij} \chi_i^1 \tag{10}$$

With the coefficients of competence in the first approximation, we may repeat the calculations using (5), (6), (7) to obtain $\chi_i^2, \lambda^2, \kappa_j^2$ in the second approximation, etc.

Now consider the results of the interview (a fragment) to illustrate how the algorithm works. Eleven informants were asked to grade five examples (A. *The room is empty. All the furniture has been removed;* B. *The room is free. All the furniture has been removed;* C. *The room is blank. All the furniture has been removed;* D. *The room is spare. All the furniture has been removed;* E. *The room is unoccupied. All the furniture has been removed;* F. *The room is vacant. All the furniture has been removed;* G. *The room is void. All the furniture has been removed*) according to the above five-point system (see Fig. 1). Table 2 features the results of the interview in the form of grades.

Table 2. Matrix of grades (a fragment).

χ_{ij}	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1	5	5	5	5	5	5	5	5	5	5	5
2	3	3	2	1	1	4	1	4	4	1	4

3	1	1	2	1	1	1	1	1	1	2	1
4	1	1	2	1	1	1	1	1	1	1	1
5	4	4	2	2	1	3	4	3	3	2	3
6	3	4	4	4	2	1	4	1	4	5	1
7	1	1	1	1	1	1	1	1	1	2	1

We start our calculations with *t* = 1. In (5) the initial values of the competence coefficients are assumed to be equal and take the value of $\kappa_j^0 = {}^{1}\!/_{m} = {}^{1}\!/_{11}$. Then, the cluster estimate for the *i^th^* sentence in the first approximation (expressed in terms of (5)) is therefore (see Table 3):

Table 3. Matrix of cluster estimates (t = 1).

χ_1^1	χ_2^1	χ_3^1	χ_4^1	χ_5^1	χ_6^1	χ_7^1
5	2.55	1.18	1.09	2.82	3	1.09

λ^1 can be obtained using (6):

$$\lambda^1 = \sum_{i=1}^{n}\sum_{j=1}^{m}\chi_{ij}\chi_i^1 = \sum_{i=1}^{7}\sum_{j=1}^{11}\chi_{ij}\chi_i^1 = 574.18$$

Table 4 features the coefficients of competence in the first approximation:

Table 4. Matrix of the coefficients of competence (t = 1).

κ_1^1	κ_2^1	κ_3^1	κ_4^1	κ_5^1	κ_6^1	κ_7^1	κ_8^1	κ_9^1	κ_{10}^1	κ_{11}^1
0.098	0.1032	0.09	0.08	0.07	0.09	0.09	0.09	0.1	0.09	0.09

With the coefficients of competence in the first approximation, we may repeat the calculations using (5), (6), (7) to obtain $\chi_i^2, \lambda^2, \kappa_j^2$ in the second approximation (see Tables 5 and 6), etc.

Table 5. Matrix of cluster estimates (t = 2).

χ_1^2	χ_2^2	χ_3^2	χ_4^2	χ_5^2	χ_6^2	χ_7^2
5	2.59	1.19	1.09	2.89	3.07	1.09

Table 6. Matrix of the coefficients of competence (t = 1; 2).

κ_j^t	**t = 1**	**t = 2**
κ_1^t	0.0980	0.0981

κ_2^t	0.1032	0.1034
κ_3^t	0.0929	0.0929
κ_4^t	0.0845	0.0845
κ_5^t	0.0692	0.0690
κ_6^t	0.0871	0.0870
κ_7^t	0.0944	0.0947
κ_8^t	0.0871	0.0872
κ_9^t	0.1028	0.1031
κ_{10}^t	0.0937	0.0920
κ_{11}^t	0.0871	0.0892
$\sum_{j=1}^{11} k_j^t$	1	1

Now consider the statistic used to assess agreement among informants − *the coefficient of concordance*. It can be calculated with the following formula:

$$W = \delta_{act}^2 / \delta_{max}^2 \tag{11}$$

where δ_{act}^2 is the actual dispersion of pooled informants' grades;
δ_{max}^2 is the dispersion of pooled grades if there is complete agreement among the informants.

The coefficient of concordance may assume a value on the closed interval [0; 1]. If the statistic W is 0, then there is no overall trend of agreement among the informants, and their responses may be regarded as essentially random. If W is 1, then all the informants have been unanimous, and each informant has given the same grade to each of the sentences. Intermediate values of W indicate a greater or lesser degree of unanimity among the informants.

To treat the grades as concurring enough it is necessary that W is higher than a set normative point W_n ($W > W_n$).

Let us take $W_n = 0.5$. Thus, in case $W > 0.5$, the informants' opinions are rather concurring than different. Then we admit the results of expertise to be valid and the group of informants to be reliable. What is more significant is that we have succeeded in the experiment, and expertise procedures were accurately arranged to meet all the requirements of the linguistic experiment.

Now consider the results of the interview (see Table 7) to illustrate the calculation procedure.

Table 7. Results of the interview (a fragment).

Informant / Sentence	1	2	3	4	5	6	7
1	5	3	1	1	4	3	1

2	5	3	1	1	4	4	1
3	5	2	2	2	2	4	1
4	5	1	1	1	2	4	1
5	5	1	1	1	1	2	1
6	5	4	1	1	3	1	1
7	5	1	1	1	4	4	1
8	5	4	1	1	3	1	1
9	5	4	1	1	3	4	1
10	5	1	2	1	2	5	2
11	5	4	1	1	3	1	1
Actual pooled grade	55	28	13	12	31	33	12
Pooled grade (if $W = 1$)	55	44	11	11	33	44	11

If the informants' opinions had coincided absolutely, each informant would have graded the first sentence as 5, the second one – as 4, the third and the forth – as 1, the fifth – as 3, the sixth – as 4, and the seventh sentence – as 1. Then the total (pooled) grades given to the sentences would have amounted to 55, 44, 11, 11, 33, 44 and 11, respectively. The mean value of the actual pooled grades is (55 + 28 + 13 + 12 + 31 + 33 + 12) / 7 = 26.3.

Then $\delta_{act}^2 = (55-26.3)^2 + (28-26.3)^2 + (13-26.3)^2 + (12-26.3)^2 + (31-26.3)^2 + (33-26.3)^2 + (12-26.3)^2 = 1479.43$

$\delta_{max}^2 = (55-26.3)^2 + (44-26.3)^2 + (11-26.3)^2 + (11-26.3)^2 + (33-26.3)^2 + (44-26.3)^2 + (11-26.3)^2 = 2198.14$

$$W = \delta_{act}^2 / \delta_{max}^2 = \frac{1479.43}{2198.14} = 0.67$$

The coefficient of concordance equals 0.67, which is higher than the normative point 0.5. Thus, the informants' opinions are rather concurring. Still the coefficient could have been higher if the grades for the second and sixth examples (see sentences B and F in Fig. 1) had revealed a greater degree of unanimity among the informants – the dispersion of grades for these sentences (D_2 and D_6) is the highest (see Table 8).

Table 8. Dispersion of grades.

D_1	D_2	D_3	D_4	D_5	D_6	D_7
0	**1.7**	0.15	0.08	0.88	**2.00**	0.08

We analysed possible reasons which might have led to some of the scatter in the grades. Here we shall consider the use of adjective *free* in the following statement: *The room is free. All the furniture has been removed.*

The research into semantics of *free* revealed that native English speakers more readily and more frequently associate the word *free* with 'costing nothing', 'without payment' rather than with 'available, unoccupied, not in use'. In case the word *free* used in the latter meaning may cause some ambiguity, native speakers opt for synonymous adjectives such as *empty, blank, unoccupied, vacant* or *available* to differentiate from the meaning of 'without cost'. Consider the following utterances with *free*: *The teacher handed a* ***free test booklet*** *to each student; Jane parked her car in a* ***free lot****; Mary entered the* ***free bathroom*** *and locked the door.*

Informants assess the statements as acceptable provided the adjective *free* conveys the information that one can have or use the objects (a test booklet, a lot, a bathroom) without paying for them. When we asked the informants to evaluate the same statements with the word *free* meaning 'available for some particular use or activity', the above sentences were graded as unacceptable*: *The teacher handed a* ***free test booklet*** *to each student; *Jane parked her car in a* ***free lot****; *Mary entered the* ***free bathroom*** *and locked the door.*

The study revealed that many statements with *free* can be conceived of in two different ways depending on the speaker's frame of reference. This ambiguity leads to a high dispersion of informants' grades, i.e. the grades appear to be spread around their mean value to a great extent and thus cannot be treated as valid.

Thus, the use of the word *free* is often situational. If there is a cost issue assumed by the speaker, it can lead to ambiguities that may explain some of the scatter in the grades. In the following statement, *The room is free. All the furniture has been removed* the speaker may have in his/her mind the possibility of a room being available for use without charge, unless it is furnished. Thus, the removal of the furniture has the effect of making the room free from cost, letting this choice seem possibly more frequently used than it might otherwise be graded. When we asked the informants to assess the statement, assuming the word *free* conveyed the information 'available for some activity', the statement was graded as acceptable, whereas the use of *free* meaning 'without payment', 'without charge' was found to be not occurring (see [18]).

3 Conclusions

Summing up the results of the research into verification procedures that rely on the methodological triangulation when experimental practices are supported by corpus-based experiment, the analysis of search engine results, and mathematical-statistical methods, we may conclude that:

1) new IT tools give a linguist value added: text corpora as well as such search engines as Google provide invaluable data, though they remain underestimated – they are to be explored as regards their full explanatory potential;

2) the results of expert evaluation, represented in the digital form, can be treated as discrete variates, and then be processed with mathematical-statistical methods; these

methods and procedures can help separate the random factor from the grade determined by the system of language; as a result the researcher obtains a mathematical calculation for the influence of deterministic as well as random factors, the consistency in informants' data and, consequently, reliability of their grades; high consistency, in its turn, testifies to the 'quality' of the group of informants and means that interviewing this group will yield good reliable data;
3) of prime importance is the elaboration of a comprehensive verification system that relies on more than one research method or data collection technique;
4) the use of triangulation as a research method in experimental linguistics is steadily bridging the gap between linguistics as an originally purely descriptive field and other sciences, where mathematical apparatus has long been applied.

References

1. Jakob, A.: On the triangulation of quantitative and qualitative data in typological social research: reflections on a typology of conceptualizing "uncertainty" in the context of employment biographies. Forum: Qualitative Social Research 2(1), 1−29 (2001).
2. Campbell, D., and Fiskel, D.: Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin 56(2), 81−105 (1959).
3. Denzin, N.: The research act: a theoretical introduction to sociological methods. Aldine, Chicago (1970).
4. Yeasmin, S., Rahman, K.F.: "Triangulation" research method as the tool of social science research. BUP Journal 1(1), 154−163 (2012).
5. Bryman, A.: Social research methods. 2nd edn. Oxford University Press, Oxford (2004).
6. Labov, W.: Some principles of linguistic methodology. Language in Society 1, 97−120 (1972).
7. Souleimanova, O.A., Fomina, M.A.: The potential of the semantic experiment for testing hypotheses. Scientific Journal "Modern Linguistic and Metodical-and-Didactic Researches" 2(17), 8−19 (2017).
8. Stepanov, J.S.: Problema obshhego metoda sovremennoj lingvistiki. In: Vsesojuznaja nauchnaja konferencija po teoreticheskim voprosam jazykoznanija (11−16 nojabrja 1974 g.): Tez. dokladov sekcionnyh zasedanij, pp. 118−126. The Institute of Linguistics, Academy of Sciences of the USSR, Moscow (1974).
9. Belaichuk, O.S.: Gipotetiko-deduktivnyj metod dlja opisanija semantiki glagolov otricanija (poshagovoe opisanie metodiki, primenjaemoj dlja reshenija konkretnoj issledovatel'skoj zadachi). In: Lingvistika na rubezhe jepoh: dominanty i marginalii 2, pp. 158−176. MGPU, Moscow (2004).
10. Fomina, M.: Universal concepts in a cognitive perspective. In: Schöpe, K., Belentschikow, R., Bergien, A. et al. (eds.) Pragmantax II: Zum aktuellen Stand der Linguistic und ihrer Teildisziplinen: Akten des 43. Linguistischen Kolloquiums in Magdeburg 2008, pp. 353-360. Peter Lang, Frankfurt a.M. et al. (2014).
11. British National Corpus (BYU-BNC), https://corpus.byu.edu/bnc/, last accessed 2019/01/17.
12. Timberlake, A.: Invariantnost' i sintaksicheskie svojstva vida v russkom jazyke. Novoe v zarubezhnoj lingvistike 15, 261−285 (1985).
13. Fomina, M.A.: Expert appraisal technique in the linguistic experiment and mathematical processing of experimental data. In: Souleimanova, O. (ed.) Sprache und Kognition: Tradi-

tionelle und neue Ansätze: Akten des 40. Linguistischen Kolloquiums in Moskau 2005, pp. 409−416. Peter Lang, Frankfurt a.M. et al. (2010).
14. Fomina, M.A.: Konceptualizacija “pustogo” v jazykovoj kartine mira. (Ph.D. thesis). Moscow City University, Moscow (2009).
15. Seliverstova, O.N., Souleimanova, O.A.: Jeksperiment v semantike. Izvestija AN SSSR. Ser. literatury i jazyka 47(5), 431−443 (1988).
16. Sulejmanova, O.A.: Puti verifikacii lingvisticheskih gipotez: pro et contra. Vestnik MGPU. Zhurnal Moskovskogo gorodskogo pedagogicheskogo universiteta. Ser. Filologija. Teorija jazyka. Jazykovoe obrazovanie 2 (12), 60−68 (2013).
17. Suleimanova, O.: Technologically savvy take it all, or how we benefit from IT resources. In: Abstracts. 53. Linguistics Colloquium, 24-27 September 2018, pp. 51−52. University of Southern Denmark, Odense (2018).
18. Fomina, M.: Configurative Components of Word Meaning. In: Küper, Ch., Kürschner, W., Schulz, V. (eds.) Littera: Studien zur Sprache und Literatur: Neue Linguistische Perspektiven: Festschrift für Abraham P. ten Cate, pp. 121−126. Peter Lang, Frankfurt am Main (2011).