Computational Linguistics and Intellectual Technologies:
Proceedings of the International Conference "Dialogue 2023"

June 14–16, 2023

Vague reference in expository discourse: multimodal regularities of speech and gesture

Olga Iriskhanova
Moscow State Linguistic University,
Institute of Linguistics RAS,
Moscow, Russia
oiriskhanova@gmail.com

Maria Kiose
Moscow State Linguistic University,
Institute of Linguistics RAS,
Moscow, Russia
maria_kiose@mail.ru

Anna Leonteva
Moscow State Linguistic University,
Institute of Linguistics RAS,
Moscow, Russia
lentevanja27@gmail.com

Olga Agafonova
Moscow State Linguistic University,
Moscow, Russia
olga.agafonova92@gmail.com

Abstract

The paper looks into the vague reference expressed in speech and gesture distribution in expository discourse. The research data are the monologues of 19 participants with total length of 2 hours 38 minutes. In these monologues, the use of vague reference (expressed in placeholders and approximators, with total amount of 2528) and functional gesture types (deictic, representational, pragmatic and adaptors, with total amount of 2309) was explored, with the aim of identifying the regular patterns of speech and gesture distribution and co-occurrence. The multimodal regularities include 1) the proportional frequency of four gesture types use equal to 6.8 / 14.4 / 28.7 / 50.1, which manifests overall distribution of co-speech gesture in expository discourse, 2) the significant difference in co-speech gesture use with placeholders and approximators which manifests itself in the use of three gesture types, adaptors, representational and pragmatic gestures, 3) the individually maintained significant difference in co-speech gesture use with placeholders and approximators which manifests itself in adaptors. These regularities can serve as predictors for identifying the specifics of vague reference in multimodal expository discourse.

Keywords: expository discourse, multimodal behavior, co-speech gesture, vague reference, multimodal regularity

DOI: 10.28995/2075-7182-2023-22-172-180

Нечеткая референция в экспозиторном дискурсе: мультимодальные константы в речи и жестах

Ольга Ирисханова
Московский государственный
лингвистический университет,
Институт языкознания РАН,
Москва, Россия
oiriskhanova@gmail.com

Мария Киосе
Московский государственный
лингвистический университет,
Институт языкознания РАН,
Москва, Россия
maria_kiose@mail.ru

Анна Леонтьева
Московский государственный
лингвистический университет,
Институт языкознания РАН,
Москва, Россия
lentevanja27@gmail.com

Ольга Агафонова
Московский государственный
лингвистический университет,
Москва, Россия
olga.agafonova92@gmail.com

Аннотация

В статье исследуется категория нечеткой референции, реализуемая в мультимодальном поведении говорящего в речи и жестах в экспозиторном дискурсе. Материалом исследования являются записи монологов 19 участников общей продолжительностью 2 часа 38 минут. В ходе анализа устанавливаются особенности совместного использования речевых показателей нечеткой референции (заместителей и аппроксиматоров, общим количеством 2528) и функциональных типов жеста (дейктических, репрезентирующих, прагматических и адаптеров, общим количеством 2309). Цель исследования заключается в обнаружении мультимодальных констант в их распределении и в совместном использовании в дискурсе данного типа. К ним отнесены 1) относительное частотное распределение четырех типов жеста в пропорции 6.8 / 14.4 / 28.7 / 50.1, 2) наличие значимых различий в использовании жестов с заместителями и аппроксиматорами в отношении трех типов жестов, адаптеров, репрезентирующих и прагматических жестов, 3) наличие индивидуального варьирования в использовании адаптеров с заместителями и аппроксиматорами. Данные константы могут рассматриваться в качестве предикторов нечеткой референции в мультимодальном экспозиторном дискурсе.

Ключевые слова: экспозиторный дискурс, мультимодальное поведение, жест, сопровождающий речь, нечеткая референция, мультимодальные константы

1 Introduction

Exploring co-speech gestures as predictors of discourse types is an important task in multimodal studies. Methodologically, this idea is rooted in D. McNeill's theory of growth points which claims that "speech and gesture are co-expressive and opposed semiotically. Each has its own means of packaging the shared idea <…>" [1, p. 84]. In this study, it is the shared view of the discourse construal which according to McNeill, gives rise to growth points, or "the smallest package of gesture-speech unity" [ibid, p. 80]. Whereas speech and gesture have been commonly studied to explore single discourse construal effects in multiple studies, there is still scarce information on how co-speech gesturing contributes to discourse construal when discourse is viewed as a multi-function phenomenon.

In recent years, recognition of discourse structuring potential of co-speech gesturing has received special attention; however, methods and instruments of such analysis are now only developing. The best performing methods utilize the functional types of gesture [2; 3, 4], visuospatial virtual simulations of gesture [5; 6], and visuospatial types of gesture [7; 8; 9; 10]. The present study develops the functional approach to gesture analysis since it allows to explore both speech and gesture functions as interrelated in a specific discourse. We address the least studied discourse type, the expository discourse which explains or develops a topic and which maintains a focus on the relations between various phenomena [11; 12]. In contrast to other discourse types, for instance the descriptive discourse which has been explored in terms of functional co-speech gestures [2; 4, 13], we still know very little about speech and gesture distribution in expository discourse. The possible explanation for this is that as opposed to other discourse types, its speech characteristics which might have served to explore co-speech gesturing are less studied.

Consequently, the article develops a discourse functional approach to multimodal analysis of expository discourse. We seek to identify the regularities which appear in the speech and gesture distribution considering both overall data sample distribution and individual variance. The contributions of the current study include (i) establishing speech, gesture and co-speech gesture distribution in the compiled corpus of expository discourse; (ii) specifying the regularity patterns of multimodal behavior in expository discourse which can serve as predictors for the discourse type under consideration.

2 Theoretical framework

2.1 Vague reference in expository discourse. Placeholders and approximators

In expository discourse, the object of reference or the event is construed as having fuzzy boundaries; therefore, vague reference can serve as the key discourse characteristics of this discourse type. Vague reference can be viewed as a discourse category which directs the choice of the speaker towards a less distinct mode of referent or event construal [14]. Following V. Podlesskaya, vague reference results from the difficulties in speech generation in case direct reference seems problematic or undesirable [15]. We expect that vague reference will appear both in speech and in gesture since this discourse category can control both communicative modalities and serve as a growth point [1] in the choice of functional

discourse markers in speech and functional gesture types. This assumption is also cognitively rooted since fuzzy categorization of objects and events is a cognitive mechanism [16] which underlies vague reference and therefore can modulate multimodal behavior.

Most commonly, when exploring vague reference in speech, the works identify its two types of discourse markers, placeholders and approximators [15] which manifest two different speech functions. Placeholders are the discourse markers which are used instead of direct reference to objects, their properties, events and other speech patterns. Approximators are words and word combinations which accompany other (both direct and vague) means of reference. In this study, we adopt the vague reference typology of discourse markers developed and tested on a smaller data sample in the study of O. Iriskhanova and Yu. Abramova [14]. **Placeholders** include impersonal pronouns (*кто-то, где-нибудь*), shell-nouns [17] like *штука, объект, состояние*, nominalized adjectives (*хорошее, непонятное, большое, древнее*), metadiscourse markers (*вот так, как-то так, что-то в этом роде*). **Approximators** include hedges which make the statement sound less categorical (*как бы, что ли, ну в общем*), hedges pointing at personal opinion (*на мой взгляд, я думаю*), indefinite pronouns and particles accompanying nouns (*какой-то, чей-то*), modal adverbs and discourse markers (*вероятно, вряд ли*), deictic pronouns and adverbs (*тут, вот, этот*), metadiscourse accompanying comments (*в смысле там, скажем так, то есть*). Placeholders and adaptors frequently appear in clusters like *пламя это что-то скорее разгорающееся и большое* which includes three placeholders (impersonal pronoun *что-то*, and two nominalized units *разгорающееся* and *большое*), as well as an approximator (hedge *скорее*); or *мне кажется что чепуха это какое-то словесное понятие* which includes a placeholder (shell noun словесное понятие), and two approximators (a hedge pointing at personal opinion *мне кажется* and indefinite pronoun *какое-то*). Consequently, while presenting two ways of categorizing vague reference, placeholders and approximators do not constitute an opposition shaping the referent or event in their discourse construal. As known, multiple studies consider clustering patterns of discourse markers as a separate research task [7; 18], however in the compiled corpus these clusters display high variance which appears in the number and order of discourse markers presented within the clusters; therefore, the decision was adopted to consider the single uses of vague reference discourse markers accompanied by gestures. This approach commonly adopted for instance in [1; 2; 3; 9] allows to specify the use of gestures as contingent on each of the functional types of discourse markers and to further identify co-speech gesture distribution and their regularity patterns in the compiled corpus of expository discourse.

2.2 Functional types of gesture

In the study, we employ the functional gesture typology developed in the works of C. Müller, A. Cienki, and O. Iriskhanova [2; 19], who differentiate four basic **gesture types** with their further specification: deictic (Pointing, Touching gestures), representational (Holding, Molding, Acting, Embodying, Tracing gestures), pragmatic (Discourse structuring, Discourse representational, Discourse emphatic, Expressing attitude/evaluation, Contact establishing gestures), and adaptors (Self-adaptors, Object-adaptors). We expect that these gestures will manifest specific proportional distribution in expository discourse and that their distribution will be different with placeholders and adaptors since they clearly realize different discourse functions. Deictic gestures point at an object to foreground it [20]. Representational gestures can be described as gestures which stimulate the speech production process due to their iconicity, i.e., resemblance to some concepts in their physical/metaphorical properties [21; 22]. Pragmatic gestures include hand movements with different subfunctions and are primarily discourse related [23; 24]. Adaptors are used to reduce anxiety and cognitive load which helps to concentrate on the subject of speech [25; 26; 27]. The process of their identification in the recorded data involves: 1) visual analysis of gestures according to their visuospatial characteristics, 2) analysis of their functions in speech based on their semantics, dependent on the verbal context.

3 Experiment design

3.1 Participants and experiment procedure

19 participants (all students, aged 18-22) took part in the experiment. Their multimodal behavior was videorecorded with a frontal camera. The experiment mentors were seated in front of the participant, their role consisted in posing the questions which stimulated expository discourse in experiment participants. Each participant answered the same 10 questions which prompted to comment on the difference between 10 pairs of close synonyms, like *roar* and *howl (рык/вой)*, *line* and *lineament (линия/черта)*, *duty* and *obligation (обязанность/обязательство)*, *burden* and *load (бремя/ноша)*. The recorded corpus of speech and gesture manifestations is 2 hours 38 minutes long. The data were then analysed in ELAN software, where they were annotated in three layers: transcriptions, speech discourse markers, and gesture types. In Fig. 1 and 2 we present the annotation examples.

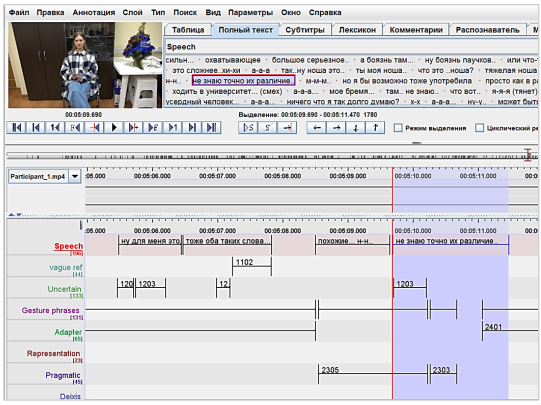

Figure 1: Approximator *не знаю* used with pragmatic gesture «не знаю точно их различие» (“don’t know exactly their difference”)

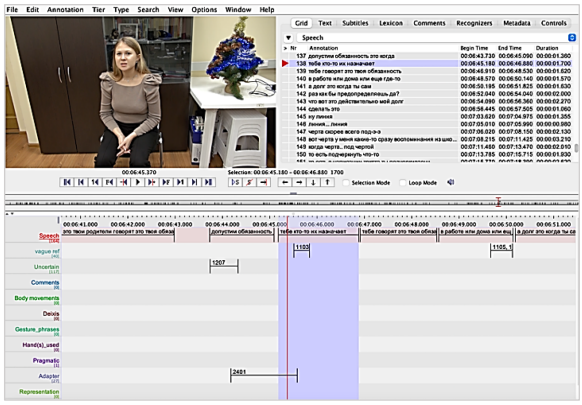

Figure 2: Placeholder *кто-то* used with self-adaptor «тебе кто-то их назначает» (“somebody assigns them to you”)

Figures 1 and 2 manifest that annotations allowed to synchronize the use of discourse markers and gestures. As seen in Figures 1 and 2, the discourse segment for speech analysis was the minimal discourse unit identified following both prosodic and syntactic criteria; most commonly it corresponds to a clause [28] manifested here in *не знаю точно их различие* (Figure 1) and in *тебе кто-то их назначает* (Figure 2). The discourse unit under consideration in Figure 1 displays three gesture uses which are pragmatic gestures (coded as 2305 and 2303) and one adaptor (coded as 2401); still the discourse marker of vague reference (coded as 1203) is synchronized only with the first pragmatic gesture (coded as 2305). In Figure 2 the discourse unit contains one discourse marker of vague reference (coded as 1103) which is synchronized with one gesture use of adaptor (coded as 2401). Two annotators decided on the choice of gesture types. In most cases it was a unanimous decision; in the cases when this decision was hampered by the presence of two possible types (or subtypes), we marked them as displaying both. Two annotators decided on the choice of discourse markers; since we had an inventory of markers, in very rare cases we had to discuss the choice.

The **data processing algorithm** included 4 steps described below.

Step 1. Analysis of frequency (activity) of two functional types of discourse markers, placeholders and approximators; and of four gesture types, deictic, representational, pragmatic and adaptors. At this step, we identify the proportional regularity of co-speech gesture use.

Step 2. Contingency tests with each function of discourse markers and each gesture type. This step helps determine whether there are specific gestures contingent with either type of discourse markers.

Step 3. Analyses of variance in speech and gesture in individual participants’ behavior. These analyses allow to qualify the differences as systemic or individual.

Step 4. Identifying the regularities in speech and gesture distribution and co-occurrence within the sample and in the individual behavior.

4 Results

4.1 Distribution of speech functions and gesture types

At Step 1 we explore frequency (activity) of two functional types of discourse markers, placeholders and approximators; and of four gesture types, deictic, representational, pragmatic and adaptors. The total number of placeholders and approximators in the compiled corpus is equal to 2528, and the total number of gestures (deictic, representational, pragmatic and adaptors) used as co-speech gestures is equal to 2309. The overall activity of speech and gesture in expository discourse is given in Table 1. Importantly, since there are cases of placeholders or approximators use not accompanied with gesture, the total number of placeholders and approximators is larger than the number of co-speech gestures.

	Deictic	**Representational**	**Pragmatic**	**Adaptors**		
Speech					**With gestures**	**Total**
Placeholders	58 (8.03)	140 (19.39)	241 (33.38)	283 (39.2)	722	768
Approximators	99 (6.24)	193 (12.16)	421 (26.53)	874 (55.07)	1587	1760
	157 (6.8)	333 (14.42)	662 (28.67)	1157 (50.11)		

Table 1: Speech and gesture frequency (Abs and (Rel))

Table 1 shows that adaptors prevail in the recorded corpus of expository discourse; still, pragmatic and representational gestures are also frequently observed. With the total number of gesture use, the proportional use of four gesture types in the sample is 6.8 / 14.4 / 28.7 / 50.1 (the mean values of gesture use in individual behavior are 9.24, 19.6, 38.94, 68.1), which can be considered a regularity of overall distribution of co-speech gesture in the expository discourse corpus.

The next question is whether different types of gestures are used with placeholders and adaptors. At Step 2 we conduct a series of contingency tests to identify the significance of differences in co-speech gesture frequency. With the number of gestures used with placeholders equal to 722 and the number of gestures used with approximators equal to 1587, the Chi-square contingency test did not show considerable differences in their distribution ($\chi2=0.478$, $p=0.49$). The results indicate that the data still manifest considerable uniformity and are more likely to be dependent on the discourse type rather than on the use of either of the two types of discourse markers. Meanwhile, we hypothesize that the use of single gesture types can manifest variance, since the proportional use of adaptors with placeholders vs. approximators is 39% and 55%, for deictic gestures it is 8% and 6%, for representational gestures – 19% and 12%, for pragmatic gestures – 33% and 27%. Four Chi-square contingency tests showed that the difference in the use of adaptors was highly significant with $\chi2=50.029$, $p< .001$; additionally, the differences in representational gestures with $\chi2=21.435$, $p< .001$, and pragmatic gestures with $\chi2=11.391$, $p< .001$ are also statistically significant. This means that there is a systemic difference in co-speech gesture use with placeholders and approximators, and it manifests itself in the use of three gesture types – adaptors, representational and pragmatic gestures. This difference can also serve as a multimodal regularity modulated by the discourse type.

However, we can expect that these differences are attributed to the individual variance in multimodal behavior. Therefore, at Step 3 we explore the variance in speech and gesture in individual participants' behavior in the recorded corpus. In Figures 3 and 4 we manifest the individual differences in speech and gesture distribution.

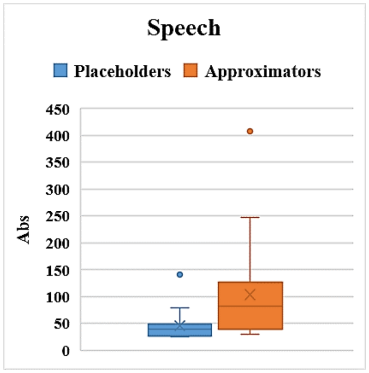

Figure 3: Box plot diagram of speech functions distribution

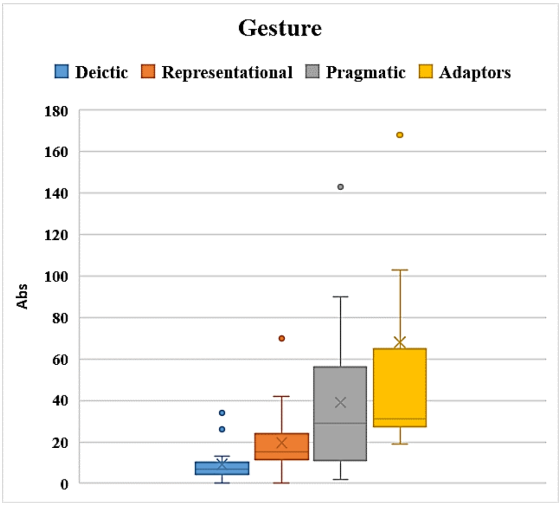

Figure 4: Box plot diagram of gesture types distribution

As we see from the diagrams, the data do not have the normal distribution (confirmed by Shapiro-Wilk tests, with $p<0.005$); therefore, we applied Repeated Measures ANOVA (Non-parametric) to determine the variance in individual use of the two functional types of discourse markers and gesture types. With $F(1) = 9.94$ and $p=0.002$ for the use of speech functions (placeholders and approximators) and $F(3) =35.8$ and $p < .001$, we can claim that the data manifest significant individual differences. However, these differences can occur either in all the gesture types or they can be attributed to a particular group of gestures. For this reason, we split the data describing the gesture use accompanying placeholders and approximators and analyze them separately. In Figure 5 the diagrams showing data distribution are presented.

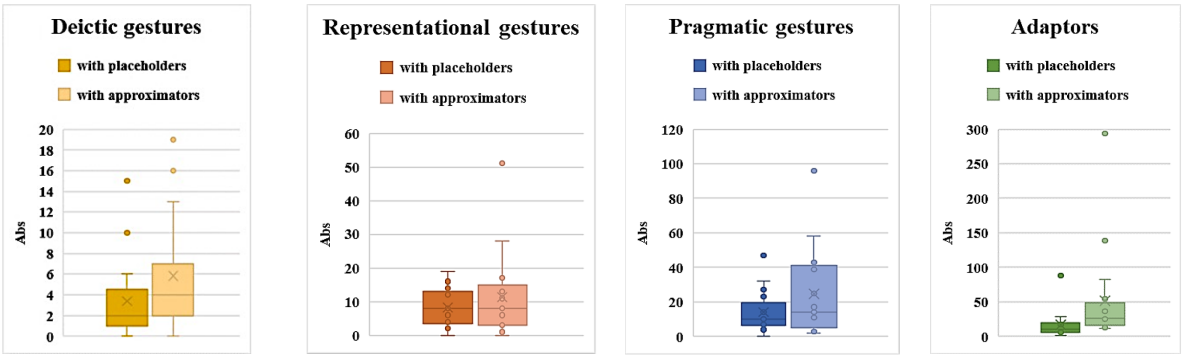

Figure 5: Box-plot diagrams with gesture distribution in individual multimodal behavior

The diagrams show that data distribution is not normal (confirmed by Shapiro-Wilk tests, with $p<0.005$). So, to determine the variance in individual use of the speech functions and gesture types we applied 4 Repeated Measures ANOVA (Non-parametric) tests.

In the use of deictic, representational and pragmatic gestures we did not observe statistically significant differences, with $F(1)=2.57$, $p=0.109$ for both deictic and representational gestures, and $F(1)=1.47$, $p=0.225$ for pragmatic gestures. Meanwhile, adaptors showed significant difference in individual use, with $F(1)=13.2$, $p < .001$. The results manifest that the differences in individual gesture use are mostly attributed to the use of adaptors, while other gesture types manifest relative uniformity. Therefore, the differences in the use of adaptors with placeholders and approximators in individual behavior serve as another multimodal regularity of the expository discourse corpus.

5 Discussion

In the present study, we expected to establish speech, gesture and co-speech gesture distribution in expressing vague reference in expository discourse, and to identify the regularity patterns of multimodal behavior which can serve as predictors for the vague reference in this discourse type.

In the recorded corpus (2 hours 38 minutes long) we identified several multimodal regularities in the use of placeholders and approximators as two speech functions of vague reference in expository discourse, and four gesture types, deictic, representational, pragmatic and adaptors. However, the regularities in individual behavior distribution appear most reliable.

The first regularity observed is **the proportional use of four gesture types**, which is 6.8 / 14.4 / 28.7 / 50.1. Although the proportional use of the gesture types cannot serve as a reliable regularity due to individual differences (see Figure 4), we can still claim that significant differences were observed only in the use of adaptors; therefore, deictic, representational and pragmatic gestures manifested common overall distribution.

The second regularity is the significant **difference in co-speech gesture use with placeholders and approximators**, which manifests itself in the use of three gesture types: adaptors (with $\chi 2=50.029$, $p< .001$), representational (with $\chi 2=21.435$, $p< .001$), and pragmatic gestures (with $\chi 2=11.391$, $p< .001$), with the last two types appearing more frequently with placeholders.

The third regularity is the **individually maintained significant difference** in co-speech gesture use with placeholders and approximators, which manifests itself in **adaptors** (with $F(1)=13.2$, $p < .001$).

The explanation of the results can be facilitated with the help of the discourse functions which gestures display. The frequent use of adaptors, which are the predominant type of gestures in expository discourse, as shown by the results obtained, proves that the speakers encounter difficulties in speech production and are forced to reduce anxiety and cognitive load to concentrate on the object of reference [25; 26]. This multimodal regularity is specific of expository discourse in contrast to descriptive or narrative discourse [13]. Meanwhile, the individual differences in the use of adaptors might indicate the difference in cognitive load/anxiety that every respondent experiences during the task, which supports the findings on individual variance in adaptors use resulting from the differences in perceived emotional stability and personality types [27].

The fact that pragmatic gestures display high frequency and high variance in their use with placeholders and approximators and more frequently accompany placeholders in the compiled corpus shows that they help the speaker to intensify or to formulate the idea of reference. Their high frequency may prove their multifunctionality in discourse which was described in [23; 24]. However, in this study we specified that this multifunctionality prevailed in case the speakers immediately construe the object of reference by using the means of vague reference rather than construe the discourse path towards an object or event while using approximators. We also found that the use of representational gestures shows variance, and representational gestures appear significantly more often with placeholders than with approximators, at least in the compiled corpus. These results conform to prior findings presented in [21; 22] which claim that representational gestures mostly display iconicity or resemblance to the objects or concepts in their properties. Still, relatively high frequency of their use with approximators may be explained by the fact that the preparation phase of gesture execution [23] is synchronized with the use of approximators.

These three multimodal regularities can be contrasted with the regularities observed in other discourse types, which will allow to identify their trans-discourse variance. Additionally, they can be used to explore the variance among different samples of expository discourse.

6 Final remarks

Overall, the study showed that there exist evident correspondences between the use of speech functions displaying vague reference and gesture types in expository discourse. The results prove that the category of vague reference habitually explored in speech is in fact a discourse structuring category which managers the choice of both speech functions and functional gesture types. Additionally, since these results were obtained via discourse functional approach to multimodality, the study also attests to the efficiency of this method in exploring multimodality in discourse.

The study is part of the project “Kinesic and vocal aspects of communication: parameters of variance” (FMNE-2022-0015) carried out at the Institute of Linguistics, Russian Academy of Sciences.

References

[1] David McNeill. Gesture-speech unity. What it is, where it came from. In S.D. Kelly, R.B. Church, M.W. Alibali (eds.) *Why gesture? How the hands function in speaking, thinking and communicating*. Amsterdam: John Benjamins Publishing Company, 2017. P. 77–101.

[2] Cornelia Müller. Gestural Modes of Representation as techniques of depiction. *Body – Language – Communication: An international Handbook on Multimodality in Human Interaction*. (Handbooks of Linguistics and Communication Science). Berlin: De Gruyter Mouton, 2014. P. 1687–1701.

[3] Alan Cienki and Irene Mittelberg. Creativity in the forms and functions of spontaneous gesture with speech. In T. Veale, K. Feyaerts, C. Forceville (eds.) *The Agile Mind: A multi-disciplinary study of a multi-faceted phenomenon*. Berlin, De Gruyter Mouton, 2013. P. 231–252.

[4] Herbert H. Clark. Depicting as a Method of Communication. *Psychol. Rev*., 123(3), 2016. P. 24–347.

[5] Stephen Kopp, Paul Tepper, Justine Cassell. Towards integrated microplanning of language and iconic gesture for multimodal output. *Proceedings of the International Conference on Multimodal Interfaces* (ICMI’04), 2004. P. 97–104.

[6] Dominique Boutet, Jean-François Jégo, Vincent Meyrueis. *POLIMOD Pipeline: tutorial: step-by-step tutorial: Motion Capture, Visualization & Data Analysis for gesture studies*. [Technical Report]. Université de Rouen, Université Paris 8, Moscow State Linguistic University, 2018.

[7] Andrej A. Kibrik and Vera I. Podlesskaya. *Night Dream Stories: A Corpus Study of spoken Russian discourse*. Moscow: Languages of Slavonic Culture, 2009.

[8] Elena A. Grishina. *Russian gesticulation as a linguistic phenomenon: corpus studies*. Moscow: YaSK, 2017.

[9] Jana Bressem, Silva H. Ladewig, Cornelia Müller. *Linguistic annotation system for gestures*. Berlin: De Gruyter Mouton, 2013.

[10] Alex Lascarides, Mathew Stone. A Formal Semantic Analysis of Gesture. *Journal of Semantics - J SEMANT*. 26. 2009. 10.1093/jos/ffp004

[11] Robert E. Longacre. *The grammar of discourse*. New York: Plenum, 1983.

[12] Ruth A. Berman, Bracha Nir-Sagiv. Comparing narrative and expository text construction across adolescence: A developmental paradox. *Discourse Processes*, 43(2), 2007. P. 79–120.

[13] Olga N. Prokofyeva, Olga K. Iriskhanova, Maria I. Kiose. Speech and gesture in descriptive discourse. In O. Iriskhanova (ed.) *Multimodal dimensions of discourse*. Moscow: YaSK, 2021. P. 63–109.

[14] Olga K. Iriskhanova, Yulia S. Abramova. Vague reference in metalinguistic tasks as a multimodal phenomenon. *Cognitive Studies of Language*, 4 (47), 2021. P. 233–244.

[15] Vera I. Podlesskaya. Vague names in Russian speech: a corpus study. *Computational Linguistics and Intellectual Technologies*, 12(19), 2013. P. 631–643.

[16] George Lakoff. Hedges. *Journal of Philosophical Logic*, 2, 1973. P. 458–508.

[17] Hans-Jeorg Schmid. *English Abstract Nouns as Conceptual Shells*. Berlin: Mouton de Gruyter, 2000.

[18] Nikolaj A. Korotaev, Vera I. Podlesskaya, Olga V. Fedorova. Disfluencies in Russian spoken monologues: a distributional analysis. *Computational Linguistics and Intellectual Technologies: Proceedings of the Annual International Conference “Dialogue”*, 19, 2020. P. 439–451.

[19] Olga K. Iriskhanova and Alan Cienki. The semiotics of gestures in cognitive linguistics: Contributions and challenges. *Issues in Cognitive Linguistics*, 4, 2018. P. 25–36.

[20] Kensy A. Cooperrider. The co-organization of demonstratives and pointing gestures. *Discourse Processes*, 53, 2015. P. 632–656.

[21] Sotaro Kita, Martha W. Alibali, Mingyuan Chu. How do gestures influence thinking and speaking? The gesture-for-conceptualization hypothesis. *Psychological review*, 124(3), 2017. P. 245–266.

[22] Martha W. Alibali, Amelia Yeo, Autumn B. Hostetter, Sotaro Kita. Representational gestures help speakers package information for speaking. *Why gesture? How the hands function in speaking, thinking and communicating*. Amsterdam: John Benjamins Publishing Company, 2017. P. 15–37.

[23] Adam Kendon. Pragmatic functions of gestures: Some observations on the history of their study and their nature. *Gesture*, 16 (2), 2017. P. 157–175.

[24] Renia Lopez-Ozieblo. Proposing a revised functional classification of pragmatic gestures. *Lingua*, 247, 2020. 102870.

[25] Paul Ekman, Wallace V. Friesen. The repertoire of non-verbal behavior: Categories, origins, usage, and coding. *Semiotica*, 1, 1969. P. 49–98.

[26] Anna V. Leonteva. Contrastive analysis of adaptors in synchronic translation. *Vestnik of Moscow State Linguistic University. Humanities*, 1(869), 2023. P. 76–81.

[27] Michael Neff, Nicholas Toothman, Robeson Bowmani, Jean E. Fox Tree, Marilyn A. Walker. Don't Scratch! Self-adaptors Reflect Emotional Stability. In H.H. Vilhjálmsson, S. Kopp, S. Marsella, K.R. Thórisson (eds.) *Intelligent Virtual Agents. IVA 2011. Lecture Notes in Computer Science*, 6895, 2011. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-23974-8_43

[28] Olga V. Fedorova, Andrej A. Kibrik, Nikolaj A. Korotaev, Alla O. Litvinenko, Julia V. Nikolaeva. Temporal coordination between gestural and speech units in multimodal communication. *Computational Linguistics and Intellectual Technologies Proceedings of the Annual International Conference "Dialogue"*, 15(22), 2016. P. 159–170.