

УДК 811.111'42

**STRUCTURAL FEATURES OF COMPOSITIONAL SPEECH FORMS IN TECHNICAL RESEARCH PAPERS****СТРУКТУРНІ ОСОБЛИВОСТІ КОМПОЗИЦІЙНО-МОВЛЕННЄВИХ ФОРМ У НАУКОВО-ТЕХНІЧНИХ СТАТТЯХ****Doronkina N.E./ Доронкіна Н.Є.**

ORCID: 0000-0001-6337-9327

Національний технічний університет України

«Київський політехнічний університет України ім. Ігоря Сікорського»,

Київ, просп. Перемоги 37, 03056

National Technical University of Ukraine

«Igor Sikorsky Kyiv Politechnic Institute», prosp. Peremohy 37, 03056

**Abstract.** The article analyzes compositional speech forms in the context of the difference between traditional, integrate, and inhomogeneous types. The ways of integration are described.

The parts of integration can be forms of both the same and different types. It was revealed that there are two types inhomogeneity in the texts of technical research papers. One of them called contamination occurs because of communicative tasks uniting. The reason of the second one is convergence of forms resulting from performing two communicative and cognitive functions at the same time.

**Key words:** compositional speech forms, contamination, convergence, argumentation, narration, description, reasoning.

**Introduction.** Horizontal decomposition of text supposes its division into the parts which are complex functional textual and speech unities. Their role is to structure the text author's idea and regulate its development. They are usually called "compositional speech forms".

They function as a subsystem of text characterized by certain way reality description. According to traditional classification there are such types as narration, description and reasoning. Each type supposes a number of subtypes and variations. In particular, communicative and cognitive function specifies five subtypes of reasoning: evidence, confirmation, explanation, validation and inherent reasoning [2]. In a real text compositional speech forms don't follow one by one but intersect. **The aim of the article** is to describe the ways of joining the forms in the genre of technical research paper.

**Material and methods.** In a stable structure scientific article there is some limitation of such forms caused by the fact that the form belongs to a certain chapter. Nevertheless, a substantial feature of the genre is the set of ways to join the forms, the component parts being both units of the same type and different one. In the last case one of the forms is dominant.

Naturally, the forms can join by adding when the end of the first form is followed by the beginning of the next one. It happens rarely inside the boundaries of one topic. Another way, interlacing, means that the parts of different forms are blended.

One of the ways for the same subtype forms to join is enumeration in case of multiple argumentation or successive points of explanation: "It is common knowledge that second-language (L2) speakers differ from one another with respect to how native-like they perceive and produce L2 sounds. *Researchers have shown that a*

*multiplicity of non-linguistic factors can explain the individual variation in the level of L2 speech attainment. Among these factors the most notable are the age of onset of L2 learning and the length of residence in the L2-speaking country. Other factors include amount of L2 use and motivation to learn and use the L2 (Piske et al., 2001).*

*Other studies have explained L2 individual variation through the comparison of the L2 variety to which learners are exposed and their native language. For instance, Escudero and Boersma (2004) proposed that Spanish learners of Standard Southern British and Scottish.” [4, P. EL254].*

A compositional speech form of the same reasoning subtype can join by complete insertion one in the framework of another form. In this case one of the forms is considered to be the main, the others being minors. For example: *“The assumption that the static components are originating from the longitudinal vibration is confirmed by measurements. It can be seen in Fig. 1 that the static components have a clear harmonic structure and are around those frequencies where the longitudinal modes are expected when calculated from the physical parameters of the string. Moreover, the frequencies do not change as a function of tension. Instead, they are inversely proportional to string length, being in good agreement with theory. This is shown in Fig.3” [7, P. EL201].*

The fragment illustrates confirmation of two hypotheses by showing experimental data in the form of diagram, the second confirmation including the first one. The same way to join forms is also possible for different compositional speech form of different reasoning subtype. *“To place the economic impact of global coffee roasting in perspective, the cost of energy required to roast the world's yearly supply is about  $\$1 \times 10^9$  (calculated using the average 2011 consumer cost of electricity in the US,  $\$0.1/kW-h$ ), hence both economic and quality optimization is of interest.” [9, P. EL265].*

Besides, the typical situation for scientific articles is insertion the compositional speech form into the form of another type. In particular, description can be inserted in reasoning.

*“The emerging triaxial induction tool comprises three mutually perpendicular transmitters and three mutually perpendicular receivers along the x, y and z direction. By collecting sufficient information from multiple directions, the triaxial induction tool is capable of detecting formation anisotropy.” [10, P. 383-384].*

Somewhat variation of that joining way is insertion a reference to the reasoning whose key part is located further in the text: *“In some cases, the dissonance of two tones is easy to understand and predict. For example, for two pure tones the dissonance is minimized when the tones have the same frequency, i.e., when there is no beating.... As we will explain, such cases apply quite well to the treble region of the piano, so this simple notion about sensory dissonance explains the piano tuning curve in the treble, a fact that has been known for some time” [5, P. 2359].*

Some compositional speech forms can also be joined by combining when two forms have common parts. The text pattern illustrating such a way consists of three parts, the first one describing a resulting situation whose cause is unknown.

*“Although Markham and Hazan (2002) reported that the mean intelligibility scores for the talkers that we selected varied little across the different types of talker*

(male, female, and child), in the present study there was a significant effect of talker type.” [6, P. EL223]. The second part includes possible explanation of situation: “While there were no significant interactions with other factors, this effect appears to be primarily attributable to poorer performance with vocoded speech from the two girl talkers.” [6, P. EL223]. The third part confirms the explanation: (97) “Poorer vowel recognition for girl talkers compared to men, women, and boys has previously been observed in CI users (Loizou et al., 1998).” [6, P. EL223].

Another type of joining is to contaminate compositional speech forms, i.e. they have the features of several ones without any prevalence. It takes place as a result of communicative tasks joining [2, C. 280].

There are two sorts of contamination: semantic and that resulting in another type of speech. In particular, contamination of description and narration is so-called “dynamic description”, i.e. the list of an object’s static features together with its actions as a part of a single topical unit [1, C.146-147].

It is supposed that contamination of reasoning and other compositional speech form is semantic because narration and description are dominant with fragments of reasoning. However, the author thinks that the degree of such a fragment engagement with argumentation is dictated by communicative intention of the text author. If any causal specification, supplement or clarification is added in the process of description or narration the fragment doesn’t belong to argumentation.

According to S. Chatmen the speech compositional forms of different types complement one another resulting in disappearance of formalistic difference between them [3, P. 8-10]. Thus, technical research papers usually include contaminate compositional speech forms taking part in argumentation when the author of text informs of research purpose or tells about the given results “In order to prove the effectiveness of the initialization to guarantee a high convergence speed of the algorithm, we calculated the average CPU time that each algorithm uses to solve the separation in each frequency. We also analyzed the performance of our initialization procedure in terms of the number of permutations. The results, summarized in Fig.2, corroborate that the proposed initialization reduces both the computational effort of the ICA algorithms and the number of permutations.” [8, P. EL125]. The fragment illustrates the contaminating union of narration and confirmation.

Besides, technical research papers often contain the narrative units without argumentative insets but still are argumentative fragments because they accomplish communicative and cognitive functions peculiar to reasoning, for example abstracts of scientific articles: *This study analyzes the handling noises that occur when a finger is slid along a wound string.* (99) “The resulting noise has a harmonic structure due to the periodic texture of the wound string. The frequency of the harmonics and the root-mean-square amplitude of the noise were found to be linearly proportional to the sliding speed. In addition, the sliding excites the longitudinal modes of the string, thus resulting in a set of static harmonics in the noise spectrum. The sliding excites different longitudinal modes depending on the sliding location.” [7, P. EL197].

Nevertheless, the technical research papers analyzed have located some argumentative fragments accomplishing two communicative and cognitive functions at the same time. This type of fragments combination is convergence of

compositional speech forms, for example: “*In order to have the possibility to determine the number of permuted solutions and some objective measures of quality of the separation, it is needed to know the exact room impulse response and the sources without errors. For this reason, we emulated real room recordings by means of synthetic mixtures. Therefore we created 25 synthetic mixtures of two speech sources.*” [8, P. EL123]. The fragment illustrates convergence of conclusion and justification.

**Results and conclusions.** The analysis of 100 technical research papers for the period of 20 years revealed several specific for the genre ways to join the compositional speech forms. It was found that there are also two types of inhomogeneity. The first type is contamination when communicative tasks of different form types are united. The second one occurs if a reasoning form performs two communicative and cognitive functions simultaneously.

All subtypes of reasoning forms are known to serve as an instrument to represent argumentation. However, other types of compositional speech forms can also take part in the process both by joining and by contamination.

#### References

1. Жерноклетова Т. Е. Разновидности функционально-смысловых текстов (на материале художественной литературы). *Вестник ИГЛ*. Иркутск, 2014. №2(27). С. 143–148.

2. Трошева Т.Б. Формирование рассуждения в процессе развития научного стиля русского литературного языка XVIII - XX вв. (сопоставительно с другими функциональными разновидностями): дис.... док. филол. наук.: 10.02.01/ Пермский государственный университет. Пермь, 2000. – 329с.

3. Chatmen S. Coming to terms. The rhetoric of narrative in fiction and film. Ithaca, 1990. 245 p.

4. Escudero P., Chládková K.. Spanish listeners' perception of American and Southern British English vowels. *Journal of the Acoustical Society of America*. 2010. Vol. 128, №5. P. EL254–EL260.

URL:<http://scitation.aip.org/content/asa/journal/jasa/128/5/10.1121/1.3488794>.

5. Giordano N. Explaining the Railsback stretch in terms of the inharmonicity of piano tones and sensory dissonance. *Journal of the Acoustical Society of America*. 2015. Vol. 138, №4. P. 2359–2366.

URL: <https://asa.scitation.org/doi/10.1121/1.4931439>.

6. Green T., Katiri T., Faulkner A. et al. Talker intelligibility differences in cochlear implant listeners. *Journal of the Acoustical Society of America*. 2007. Vol. 121, №6. P. EL223–EL229.

URL:<http://scitation.aip.org/content/asa/journal/jasa/121/6/10.1121/1.2720938>.

7. Pakarinen J., Penttinen H., Bank. B. Analysis of handling noises on wound strings. *Journal of the Acoustical Society of America*. 2007. Vol. 122, №6. P. EL197–EL202. URL:<http://dx.doi.org/10.1121/1.2786607>.

8. Sarmiento A., Durán-Díaz I., Cruces S. Initialization method for speech separation algorithms that work in the time-frequency domain. *Journal of the Acoustical Society of America*. 2010. Vol. 127. №4. P. EL205–EL210.

URL:<http://scitation.aip.org/content/asa/journal/jasa/127/4/10.1121/1.3310248>.

9. Wilson P. S. Coffee roasting acoustics. *Journal of the Acoustical Society of America*. 2014. Vol. 135, №6. P. EL265–EL269.

URL:<http://dx.doi.org/10.1121/1.4874355>.

10. Zhang Z. J., Yuan N., Liu R. 1-D inversion of triaxial induction logging in layered anisotropic formation. *Progress in electromagnetic research*. 2012. Vol. 44. P. 383–403. URL:<http://www.jpier.org/PIERB/pierb44/18.12081606.pdf>.

### References.

1. ZHernokletova T. E. (2014). Raznovidnosti funkcional'no-smyslovyh tekstov (na materiale hudozhestvennoj literatury) [Variations of functional and notional texts (a case study of fiction)]. *Vestnik IGL. Irkutsk*, issue 2, vol. 27. pp. 143-148.

2. Troshcheva T.B. (2000). Formirovanie rassuzhdeniya v processe razvitiya nauchnogo stilya russkogo literaturnogo yazyka XVIII - XX vv. (sopostavitel'no s drugimi funkcional'nymi raznovidnostyami) [Formation of reasoning in the process of Russian scientific style development XVIII – XX centuries ( in comparison with other styles)]: dis.... dok. filol. nauk.: 10.02.01/Permskij gosudarstvennyj universitet. Perm', 329 p.

3. Chatmen S. (1990). Coming to terms. The rhetoric of narrative in fiction and film. Ithaka. 245 p.

4. Escudero P., Chládková K.. (2010). Spanish listeners' perception of American and Southern British English vowels. *Journal of the Acoustical Society of America*. issue 5, vol. 128. pp. EL254-EL260.

URL:<http://scitation.aip.org/content/asa/journal/jasa/128/5/10.1121/1.3488794>.

5. Giordano N. (2015). Explaining the Railsback stretch in terms of the inharmonicity of piano tones and sensory dissonance. *Journal of the Acoustical Society of America*. issue 4, vol. 138. pp. 2359-2366. URL: <https://asa.scitation.org/doi/10.1121/1.4931439>.

6. Green T., Katiri T., Faulkner A. et al. (2007). Talker intelligibility differences in cochlear implant listeners. *Journal of the Acoustical Society of America*. issue 121, vol. 121. pp. EL223-EL229. URL:<http://scitation.aip.org/content/asa/journal/jasa/121/6/10.1121/1.2720938>.

7. Pakarinen J., Penttinen H., Bank. B. (2007). Analysis of handling noises on wound strings. *Journal of the Acoustical Society of America*. issue 6, vol. 122. pp. EL197-EL202. URL:<http://dx.doi.org/10.1121/1.2786607>.

8. Sarmiento A., Durán-Díaz I., Cruces S. (2010). Initialization method for speech separation algorithms that work in the time-frequency domain. *Journal of the Acoustical Society of America*. issue 4, vol. 127. pp. EL205-EL210.

URL: <http://scitation.aip.org/content/asa/journal/jasa/127/4/10.1121/1.3310248>.

9. Wilson P. S. (2014). Coffee roasting acoustics. *Journal of the Acoustical Society of America*. issue 6, vol. 135pp. EL265-EL269. URL:<http://dx.doi.org/10.1121/1.4874355>.

10. Zhang Z. J., Yuan N., Liu R. (2012). 1-D inversion of triaxial induction logging in layered anisotropic formation. *Progress in electromagnetic research*. vol. 44. pp. 383–403. URL:<http://www.jpier.org/PIERB/pierb44/18.12081606.pdf>.

**Анотація.** Статтю присвячено особливостям структурним особливостям композиційно-мовленневих форм, що виникають в результаті горизонтального членування тексту, у жанрі науково-технічної статті. Метою статті є опис с пособі поєднання таких блоків, а також відхилень від традиційних типів композиційно-мовленневих форм. Проведене дослідження виявило, що текст науково-технічної статті складається з блоків, поєднаних між собою низкою таких способів, як: приєднання, чергування, перелік, включення одного до складу іншого, та суміщення. Крім того, виявлено змістовні поєднання, а саме: контамінація та конвергенція, причому складовими для такого поєднання слугують КМФ одного підтипу, КМФ різних підтипів, що належать до одного типу та КМФ різних типів.

*Виявлено, що композиційно-мовленнєві форми всіх типів здатні приймати участь у реалізації аргументації.*

**Ключові слова:** *композиційно-мовленнєві форми, контамінація, конвергенція, аргументація, розповідь, опис, міркування.*

Науковий керівник: д.філ.н., проф. Іщенко Н.Г.

Статтю відправлено: 25.02.2020 р.

© Доронкіна Н. Є.