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## SOURCE WORDS IN THE NOUN FAMILY OF WORDS ENDING WITH -LOGY

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### *Abstract*

The paper presents the structural-semantic characteristic of source words in terminological word-forming families ending with *-logy*. They define formal and semantic features of their derivatives, their behavior in the word formation, in many ways determine the features of system organization of word formation. In the course of the study, the source words ending with *-logy* and *-graphy* were compared with the same prepositive component. This comparison gives much information on deep systemic connection of words ending with *-logy* and *-graphy* at conceptual and word-forming level, on different manifestations of the mode of competition between these words, on the commonality of mechanisms of generation in word families (WF) of these nouns within one lexico-semantic group (LSG), etc. ] It was established that the main part of the source nouns ending with *-logy* represents two- and less often three-component additions created on the basis of related roots (terminoelements) of Greco-Latin origin (source-non-derivatives). In the first part of additions ending with *-logy* more than a hundred roots are used, most of which act as prepositive parts not only in words ending with *-logy*, but also in words ending with *-graphy*. All source-non-derivative nouns ending with *-logy* have segmentability. The study revealed a range of regular and irregular types of syncope and other morphological phenomena typical for sub-families ending with *-logy*. Part-of-speech tagging and lexico-semantic characteristics of generating bases themselves make it possible to establish which groups of words are included into the process of terminological word formation.

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**Keywords:** Family of words, source word, formal-sense relations, segmentability, derivativeness, word-forming activity.



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## 1. Introduction

Despite the fact that the beginning of active study of formal-sense relations between derived words in WF was established in the 1970s, the interest to WF is still relevant. In recent years, the range of problems related to the analysis of WF and the variety of approaches to them have recently expanded (Evseeva, 2018). Different studies focus not only on grammatical, word-building, lexical relations of WF, but also on their cognitive abilities. The potential words of different thematic groups (Svechkareva, 2006), peculiarities of the development of international vocabulary, discursive aspect of derivatives (Puzynina, 2007), issues of word-formation synonyms (Mengel, 2007), etc. are particularly interesting.

However, the reference point of any WF is the source word. As Vinokur (1959) notes, there may be no conceivable or imaginary mediating link, but its first stage, its starting point cannot be absent. Source words lead word families and play an extremely important role in the structural organization and semantic arrangement of word formation (WF). They define the formal and semantic features of their derivatives, their behavior in the acting mechanism of word formation. They lead word-forming paradigm. The entire families of words inherit their various properties. The source words largely determine the peculiarities of the word-generating mechanism of a language, the system organization of word formation (Tikhonov, 1974).

## 2. Problem Statement

This work is devoted to the study of the system of word-forming nouns ending with *-logy* and, in particular, the structural-semantic description of the source words in a given group of nouns.

The mechanism of word families is directly determined by structural and semantic characteristics of the source word. The productive strength of the source word and the derived members within the word family, the degree of structural complexity of the WF and its lexical content are regulated and stimulated mainly by these extralinguistic factors (Ushakova, 2017).

## 3. Research Questions

The study presents the analysis of 127 WF with source words ending with *-graphy* and *-logy*. The following dictionaries served as a source of language material: Great Soviet Encyclopedia (1978); Great Encyclopedia Dictionary (2002); Modern Encyclopaedia (2000); Explanatory Dictionary of Foreign Words (Krysin, 1998). The choice of WF with source words ending with *-graphy* and *-logy* as the subject of the study is determined by the fact that these terminological WF have numerous classes of words characterized by high productivity mainly in the special sphere, and great functional, semantic and word-forming abilities.

The interaction of meaning and derivation characteristics in WF with source-polysemants ending with *-graphy* and *-logy* within different LSG are subject to uniform regularities.

#### 4. Purpose of the Study

In order to give a synchronous formal-semantic description of word-forming noun families ending with *-logy*, to identify the main trends and prospects of development of these groups of nouns there is a need to solve the following tasks: 1) to determine the composition of described nouns and to identify their boundaries; 2) to establish the direction of derivativeness in correlation pairs of words ending with *-graphy*; 3) to provide complex (structural, semantic, functional) description of source and derived members of the studied families; 4) to identify factors regulating the mechanism of word generation within the studied families; 5) to identify structural-semantic types of families, to establish the features of typological similarity and distinction between them.

#### 5. Research Methods

The study was conducted synchronously taking into account the systemic relations of the analyzed facts. The leading method was a descriptive method involving such techniques as observation, comparison, generalization, and elements of transformative and component analysis.

#### 6. Findings

The study makes it possible to state that the source words lead the word families and indeed play an extremely important role in the structural organization and semantic arrangement of the family, determine formal and sense characteristics of derivatives, their behavior in the acting mechanism of word formation.

#### 7. Conclusion

1. On the basis of the analysis of formal-sense relations between nouns ending with *-logy*, *-logist* it is found that the source words in the WF (in total 127 sub-families were analyzed) of this group are nouns with *-logy*. Single cases, when words ending with *-logist* serve the source link, are caused by their extracorrelational existence or lack of semantic relation to the word ending with *-logy*.

2. According to their structure, most source nouns ending with *-logy*, *-logist*, as well as words ending with *-graphy*, *-graph*, are two- and less often three-component additions created on the basis of related roots of Greco-Latin origin. Due to their absence in the synchronous system of word formation of producing bases, such words in the present work refer to nonderivative ones. Cf.: *balneology* [lat. *balneum* bath + *logos* teaching] – “a section of medicine studying mineral waters and their therapeutic and preventive application”; *palinology* [gr. *paline* fine dust + *logos* teaching] – “a section of botany studying pollen and plant spores”; *patrology* [gr. *pater*, lat. *pater* father + *logos* teaching] – “a section of Christian theology devoted to the study of biography and writings of church fathers”; *axiology* [gr. *axios* valuable + *logos* teaching] – “philosophical teaching of values, as well as *gastroenterology* [gr. *gaster* stomach, *enter* gut + *logos* teaching] – “a section of medicine studying the structure and functions of digestive organs, their diseases”.

In the first part of additions ending with *-logy* the following roots are used: *anthrop(o)* [from gr. *antropos* man – “related to a man”]; *aer(o)* – [from gr. *aer* air – “aviation, air”], *bio-* [from gr. *bios* life – “belonging to life, vital processes”]; *geo-* [from gr. *ge* land – “associated with the Earth, the globe, the Earth’s crust”]; *hydr(o)* – [from gr. *hudor* water, moisture – “belonging to water, water spaces”]; *angi(o)* – [from gr. *angeion* vessel – “vessel, vascular system”]; *ophthalm(o)* – [from gr. *ophthalmos* eye – “referring to eyes, eye diseases”], etc. There are more than a hundred of them. In the second part there is a connected root *-log* – [from gr. *logos* concept, teaching – “science, knowledge”].

Most of the above thermoinlements act as prepositive parts not only for words ending with *-logy*, but also for words ending with *-graphy*.

There are different relations between words having a common prepositive component. In some cases, this leads to synonyms and even to a competition mode between them, which is characterized not only and not so much by the frequency of usage but by the realization of word-forming abilities of each of them. Cf.: *ampelology* – “the same as *ampelography*, rarely used” – *ampelography* – “science of grape varieties, patterns of variability of their properties”:

<b>ampelology</b>	<i>sin.</i>	<b>ampel(o)graph(y)</b>
		<i>ampelograph</i>
		<i>ampelograph-ic-al</i>

*petrography* – “*sin. petrology* – science of rocks, their mineralogical and chemical composition, structure, origin”.

<b>petr(o)log(y)</b>		<b>petr(o)graph(y)</b>
petrologist		petrograph
petrolog-ic-al		petrograph-experimentator
lith- <u>o</u> -petrological		geologist-petrographer
petrolog- <i>o</i> -chemical		petrograph- <u>ist</u>
		petrograph- <u>ic</u> -al
		geologic- <i>o</i> -petrographical

Cf. also: *ethnography* – “branch of historical science studying composition, origin, settlement of peoples of the world and finding out and generalizing general patterns of development of human culture” and *ethnology* – “same as ethnography. The term is rarely used”: “*Ethnography* is the science of peoples. This science is sometimes called *ethnology*. Foreign scientific literature sometimes distinguishes between “ethnography” as purely descriptive science and “ethnology” – generalizing, theoretical science”.

<b>ethno/log(y)</b>	<i>sin.</i>	<b>ethno/graph(y)</b>
ethnologist		ethnographer
ethnologist-Slavicist		ethnographer-Africanist
ethnolog-ic-al		
historic- <u>o</u> -ethnological		ethnograph- <u>ism</u> archeological
		ethnograph- <u>ic</u> -al
paleo/ethnolog(y)		ethnograph- <u>o</u> - archeological
paleoethnologist		cleric- <u>o</u> -ethnographical
paleoethnolog- <u>ic</u> -al		

Developing according to the laws of this LSG, word families are characterized by a commonality of generation mechanisms. At the same time, the degree of structural complexity and intensity of its lexical content is certainly higher for WF *ethnography* (23 derivatives). This is caused by the development of the applied direction of this science, which is reflected in the set of derivatives and peculiarities of their derivational behavior in the word family. As for WF *ethnology*, it shows that the level of word formation activity and the system of its derivatives can give more accurate information than the dictionary definition on the status of the source word, on the direction and degree of development of the science it refers to.

The relations between words ending with *-logy* and *-graphy* having the same prepositive component may be different. One LSG (LSG “science, field of knowledge”) of a word ending with *-graphy* may designate a branch of science, or a narrower special area within that science which is called by a noun ending with *-logy*, for example: *archeology* – *archaeography*; *hydrology* – *hydrography*, etc. At the same time, the word-formation potential of nouns ending with *-graphy* is lower than that of words ending with *-logy* (Cf.: in WF with the source word *archeography* there are 4 derivatives, and in WF with the source word *archaeology* – 15). However, in case of polysemy of the word ending with *-graphy* and the modernization of the practical, applied direction of this branch of science, its generating abilities increase sharply, and according to the degree of structural complexity and lexical content it does not only concede, but also exceeds the corresponding WF of a noun ending with *-logy*. Cf.: *hydrography* – “1) a section of terrestrial *hydrology* devoted to the description of rivers, lakes, reservoirs and their separate parts with qualitative and quantitative characteristics of their position, physical and geographical conditions and utilization mode; 2) a set of measures to ensure safety of navigation on water bodies; 3) diagram and mapping of water bodies, as well as drawing up and description of navigational directions”. Cf.: WF *hydrology* – 20; WF *hydrography* – 26.

The correlation of the words *aerology* is also interesting – “a section of meteorology studying the processes taking place in the troposphere and atmosphere” and *aerography* – “1) a method of painting tissues by spraying paints with compressed air and a pulverizer; 2) same as *aerology*”.

**aer(o)log(y)** – aerologist “a person”

air-aerologist

engineer-aerologist

aerolog-ic-al

**aer(o)graph(y)**

aerograph

aerograph-ic-al 1

aerograph-ic-al 2

As can be seen, WFs are characterized by almost equal word-forming abilities. However, in WF *aerography* the system of derivatives implements the productive energy of LSV “method of color”, which led to the development of the word family according to the laws of the corresponding LSG. The meaning “the same as *aerology*” in the word *aerography* remained unrealized at all or realized in only one derivative – adjective ending with *-ic-al*. This means that the words *aerology* and *aerography* are “separated” across different lexico-semantic groups. This example once again proves that the system of

derivatives allows defining the status of a word in lexical and word formation systems, clarifying its paradigm and reflecting syntagmatic relations.

The comparison of source words ending with *-logy* and *-graphy* with the same prepositive component gives more information about deep system relation of words ending with *-logy* and *-graphy* at conceptual and word formation level, about different competition modes between these words, about commonality of generation mechanisms in WF of these nouns within the framework of one LSG, etc.

3. For the purpose of the most adequate description of word-generating abilities of nouns ending with *-logy*, identification of factors regulating and stimulating these abilities, we observed not only WF with source-non-derivative nouns ending with *-logy*, but also WF with source-derivatives of the first and second stages of word formation, i.e. sub-groups formed from words ending with *-logy* in the composition of other WF, for example: *volcanology* – “science of volcanos” (volcano – volcan-o-logy); *assyriology* – “science of languages, writing, culture and history of Assyria” (Assir(ia) – assyri-o-logy); *bituminology* – “science of natural bitumen, its physical and chemical characteristic and origin” (bitumen – bitum-en/o-logy); *papyrology* – “science dedicated to the study of ancient manuscripts on papyrus” (papyr(us) – papyr-o-logy).

4. All source nouns ending with *-logy* have segmentability. Most of the source non-derived words are characterized by complete related segmentability (each component of such a word is found in other words), for example: *angiology* [gr. *angion* vessel] – *angiography*, *angioma*, *angioneurosis*, *angiospasm*, etc., as well as *rheology*, *serology*, etc., *histology* [gr. *histos* tissue] – *histogenesis*, *histones*, *histolysis*, etc., as well as *phenology*, *futureology*, etc. They are less likely to have incomplete related segmentability. For example, in a word *eschatology* [gr. *eschatos* last] – “mystical doctrine of the ultimate fate of the world and a man, which is part of many religions” the component *eschato-* is not found in connection with other roots and is distinguished by the separation of the second related root *-log*. Cf. also: *herpetology* [gr. *herpeton* reptile] – “section of zoology studying reptiles”, *etiology* [gr. *aitia* cause] – “medical doctrine of causes of diseases”, etc., in which the components *herpeto-* and *ethno-* are also residually separated due to segmentability of the second component.

As for the source derivatives of nouns ending with *-logy*, all of them are characterized by complete free segmentability, since their first component exists as an independent word, for example: *kartvel(s)* – kartvel-o-logy, *Byzant(ium)* – byzant-o-logy, *arachkoentomos(es)* – *arachkoentom*-o-logy, *transplant(ation)* – transplant-o-logy.

As seen, the producing basis may be fully or partially included into a derivative in its short form (in 65 out of 105 cases the source sub-families ending with *-logy* and in 45 out of 77 cases the source sub-families ending with *-graphy* may be fully included into the derivative). The analysis shows that there is a number of fairly regular types of reductions typical for sub-families ending with both *-logy* and *-graphy*. Cf.:

1) *allerg(y)* – *allergi*-o-logy; *Angl(o)* – *angl*-o-logy, as well as: *Byzant(ium)*, *Ind(ia)*, but *resuscitat(ion)*, *divers(ion)* – *derivat*-o-logy (Cf. also: *symmetry(y)* – *symmetry*-o-graph);

2) *ide(a)* – *ide*-o-logy; *bacteri(a)* – *bacteri*-o-logy, as well as: *malari(a)*, *transfuse(ion)*, etc. (cf. also: *arteri(a)* – *arteri*-o-graphy, *histor(y)* – *histori*-o-graphy, *potency(a)* – *potenti*-o-graph);

3) cosmet(ics) – cosmet-o-logy; polit(ics) – polit-o-logy, as well as Atlant(ic) (cf.: dynam(ics) – dinam-o-graphy); intonate(ion) – inton-o-logy; transplant(ation) – transplant-o-logy;

4) phytocene(oses) – phytocene-o-logy, as well as: arachkoentomos(es).

All other cases of reducing the noun bases are irregular even in sub-families ending with *-logy*, cf.: rheumato(logy), glossit(is), phyt(in), cryolith(ozone), part(ides), embry(on), epizooty(y), phon(eme), etc. (cf. *-graphy*: appendi(x), perspect(ive), ideo(gram), etc.) The reduction of generation bases of adjectives in sub-families ending with *-logy* is not regular: endocr(ine) – endocrin-o-logy; venereal – venere-o-logy. In some cases, the motivating adjective acts in its variants: semit(ic) – semit-o-logy.

As can be seen, mainly nouns serve as producing bases for words ending with *-logy*, less often – adjectives, while verbs – almost never.

As a rule, various combinations of phonemes are reduced in the generating base, in some cases the reduced part is a suffix. Note that the generating bases can participate in the formation of words ending with *-logy* in the same form as in affixal words (e.g.: bacteri(um) – bacteri-al and bacteri-o-logy, rheumat(ism) – rheumat-is-mal and rheumat-o-logy), but most often the reduction of the same basis in the formation of affixal words and words ending with *-logy* (as well as with *-graphy*) is different (Cf.: polit(ics) – polit-o-logy, but polit-ic-al, Atlant(ic) – atlant-o-logy, but atlant-ic, embry(on) – embry-o-logy, but embryon-al, etc.) (Ulukhanov, 1975).

It is extremely rare when the reduction of the generating base of words ending with *-logy* is accompanied by alternation. This morphological phenomenon is observed only in such cases as derivate(ive) – derivativat-o-logical, reanimate(ion) – reanimat-o-logical, etc. As A.N. Tikhonov notes, the reduction of the generating base most often occurs at affixation, less often it is observed at addition (Tikhonov & Denisenko, 1972). The source derivatives of the first and second stages of word formation ending with *-logy* open the possibility for deeper study of this phenomenon in another group of complex word-terms.

The partial and lexico-semantic characteristic of the generating bases themselves makes it possible to establish which groups of words are included into the process of terminological word formation, and the use of the same word as the generating basis both for a noun ending with *-logy* and for a noun ending with *-graphy* highlights another aspect of systemicity of these groups of words at lexical and word-forming level – they form a sub-family within the same WF.

5. Among the source nouns ending with *-logy* there are words with and without a connecting vowel. The question of the connecting vowel is not merely a statement, but is essential when reflecting the word structure of derived words in a family, in which it is distinguished on the basis of the same principles as in the source words (Fedorova, 1976).

Easily, the connecting vowel is identified in the source-derived nouns ending with *-logy*, since the first part in them is a free root or a reduced base. In cases like embry(on) – embry-o-logy, allowing the possibility of two solutions to this issue: embry(on) – embry-o-logy and embryo(n) – embryo/logy – the first interpretation appears preferable, as in the case of cosm(os) – cosm-o-logic, because it finds confirmation in that the vast majority of source-derived nouns ending with *-logy* (as well as with *-graphy* and with *-metry*) are formed by connecting vowels. In this case, the statement of Tikhonov that the Russian language is not characterized by name bases for vowels seems quite convincing (as cited in

Tikhonov & Denisenko, 1972). Thus, the identification of a connecting vowel in the word *embryo-o-logy* is explained by the action of the law of analogy in a language.

As for the source-non-derivatives, then similar to the words ending with *-graphy*, in many cases affixal formations help to separate the connecting vowels from the root, for example: *acar-o-logy* [gr. *akarus* mite] – “section of zoology studying mites” (cf.: *acarids* – “mites, group of arthropods”); *ampel(o)logy* [gr. *ampelos* grapes] – “science of grape varieties” (cf.: *ampelous* plants – “ornamental plants with long hanging shoots cultivated in hanging vases”).

The connecting vowel can also be distinguished on the basis of comparison of complex words with the same components, for example: *path(o)logy* [gr. *pathos* suffering] – “science of painful processes and states of the body” (cf. *homoeopath* – a doctor treating using homeopathy) [gr. *homoios* similar + *pathos* suffering]; *phil(o)logy* [gr. *phileo* love] – “a set of sciences studying the language and literature of people” (cf. *bibliophile* [gr. *biblion* book *phileo* love] – “booklover, judge of books, book collector”).

Among nouns ending with *-logy* there are quite a few words characterized by the structural non-separability of the etymological connecting vowel. Thus, the connecting vowel in the words *angio/logy* [gr. *angeion* vessel] – “section of anatomy studying cardiovascular and lymphatic system” – *angioma*, *angioneurosis*, *angiostomids*, *angiostomy*, *angiosperms*; *osteo/logy* [gr. *osteon* bone] – “section of vertebrate anatomy; studies the shape and structure of bones in connection with their function” – *osteoblasts*, *osteography*, *osteoma*, *osteomyelitis*, *osteon*, etc. The etymological vowel is also not identified from the related roots *anro-*, *archaeo-*, *balneo-*, *batrach-*, *bio-*, *brio-*, *geo-*, *geronto-*, *gnoseo-*, *ario-*, *carpo-*, *ichthyo-*, *onto-*, etc.

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