

**ETYMOLOGICAL ANALYSIS OF NOUN SUFFIXES, FUNCTIONING  
IN THE TEXT CORPORA OF SCIENTIFIC AND TECHNICAL DISCOURSE  
(ON THE BASIS OF “ELECTRICAL ENGINEERING”, “CHEMICAL ENGINEERING”  
AND “AUTOMOTIVE” TEXTS)**

**ЕТИМОЛОГІЧНИЙ АНАЛІЗ СУФІКСІВ ІМЕННИКА, ЯКІ ФУНКЦІОНУЮТЬ  
В ТЕКСТОВИХ КОРПУСАХ НАУКОВО-ТЕХНІЧНОГО ДИСКУРСУ  
(НА МАТЕРІАЛІ ТЕКСТІВ З ЕЛЕКТРОТЕХНІКИ, ХІМІЧНОГО  
МАШИНОБУДУВАННЯ ТА АВТОМОБІЛЕБУДУВАННЯ)**

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The article presents the results of a brief genetic analysis of the suffixes found with nouns in the English technical texts of three specialties “Chemical Engineering”, “Electrical Engineering” and “Automotive” and then compare them (results) in order to indicate differential and integral characteristics in noun suffixes of these three text corpora. The inventory of noun suffix morphemes functioning in the studied text corpora of the scientific and engineering discourse has the following content: a) native (Germanic) suffixes – 5 units in all three text corpora; b) suffixes of Romance origin in the corpus “Chemical Engineering” 19, in the corpora “Automotive” and “Electrical Engineering” – 16 each, 14 suffix morphemes of them are common to all three specialties: c) 3 suffixes of Greek origin in all three corpora. Genetic analysis of noun suffix morphemes found in the analysed text corpora of scientific communication has shown that there are much fewer native suffixes in the English texts of engineering than the borrowed ones. However, they are actively involved in the formation of nouns, giving them, basically, the abstract meaning “instrumentation”. The high activity of suffixes of Germanic origin is evidenced by the fact that they created a third of nouns in the text corpora “Chemical Engineering” and “Automotive” and the fifth part – in the “Electrical Engineering” texts. Suffixes of Romance origin occupy a dominant position in the suffix word formation of nouns in the studied corpora. They form 65-67% of all suffix nouns in “Chemical Engineering” and “Automotive”, and 79% in “Electrical Engineering”. A characteristic feature of suffixes of Romance origin is their high ability in creating the nouns with abstract meanings “process”, “state”, “result of action”. Suffixes of Greek origin occur only in several words. Considering the possible dependence of the frequency of use of noun suffix morphemes of various origins with a certain meaning on such an extra linguistic factor as scientific specialty the authors came to the conclusion that such a dependence exists, and it is of differential nature. First of all this is observed in the degree of influence that the original (German) suffixes have on the word formation of nouns. When carrying out a genetic analysis of the borrowed suffix morphemes it was traced, basically, the presence of integral characteristics in all three text corpora.

**Key words:** abstract meaning, frequency, origin, statistic methods, specialty.

У статті наведено результати короткого генетичного аналізу суфіксів, які зустрічаються з іменниками в англійських технічних текстах трьох спеціальностей «Хімічне машинобудування», «Електротехніка» та «Автомобілебудування», а потім порівняно їх (результати) для позначення диференціальних та інтегральних характеристик в суфіксах іменників у цих трьох текстових корпусах. Інвентар іменникових суфіксальних морфем, що функціонують у досліджуваних текстових корпусах науково-технічного дискурсу, має такий зміст: а) рідні (германські) суфікси – 5 одиниць у всіх трьох текстових корпусах; б) суфіксів романського походження в корпусі «Хімічна інженерія» 19, у корпусах «Автомобілебудування» та «Електротехніка» – по 16, 14 суфіксальних морфем з них є спільними для всіх трьох спеціальностей: в) 3 суфікси грецького походження в усіх трьох корпусах. Генетичний аналіз іменникових суфіксальних морфем, виявлених у аналізованих текстових корпусах наукової комунікації, показав, що рідних суфіксів в англійських технічних текстах значно менше, ніж запозичених (романських та грецьких). Проте вони активно беруть участь в утворенні іменників, надаючи їм, в основному, абстрактне значення «знаряддя». Про високу активність суфіксів германського походження свідчить той факт, що вони створили третину іменників у корпусах текстів «Хімічне машинобудування» та «Автомобілебудування» та п'яту частину – у текстах «Електротехніка».

У суфіксальному словотворенні іменників досліджуваних корпусів домінуюче місце займають суфікси романського походження. Вони становлять 65–67% усіх суфіксальних іменників у «Хімічній інженерії» та «Автомобілебудуванні» та 79% у «Електротехніці». Характерною рисою суфіксів романського походження є їх висока здатність творити іменники з абстрактними значеннями «процес», «стан», «результат дії». Суфікси грецького походження зустрічаються лише в кількох словах. Розглядаючи можливу залежність частоти вживання суфіксальних морфем іменників різного походження з певним значенням від такого позамовного чинника, як наукова спеціальність, автори дійшли висновку, що така залежність існує, і вона носить диференційний характер. Перш за все це спостерігається в ступені впливу вихідних (німецьких) суфіксів на словотвір іменників. При проведенні генетичного аналізу запозичених суфіксальних морфем простежено, в основному, наявність інтегральних характеристик у всіх трьох текстових корпусах.

**Ключові слова:** абстрактне значення, частота, походження, статистичні методи, спеціальність.

**Introduction.** Derivational typology can be called one of the most common topics in linguistics. The reason for such popularity is the influence of word formation on the composition of the language and methods of its replenishment. Among them (methods) the leading one is word production, where the following main types of word formation were present alone or in combination with each other: conversion, affixation, compression, basic composition, abbreviation, disaffixation, separation of meaning. However, only affix word formation can be called permanent, i.e. the one whose productivity, with varying fluctuations, has been noted throughout the recorded history of the English language up to modern times.

The problems of English word formation have been developed in sufficient detail in linguistics not only by English and American grammarians [1; 2; 3; 4] but the scientists in other countries [5; 6; 7].

The question of genesis in the affix word-formation of the English language, both in the fundamental works and in the dissertations of young researchers, did not go unnoticed by linguists. Here the main material for the genetic (etymological) analysis of word-formation units is usually data obtained from dictionaries, for example, the 12-volume Great Oxford Dictionary [8] and its appendices, from the dictionaries of The Oxford Dictionary series, the dictionary C.T. Onions. The Oxford Dictionary of English Etymology-1966 [9], various types of grammars, historical documents, etc.

However, in recent years in linguistics as a whole there has been a gradual shift towards the study of linguistic variability, from language to speech, from norm to usage [10; 11]. Preference is given to research in theoretical and applied linguistics based on modern corpus technologies. In this article, as the title of the proposed article suggests, the text corpora formed on the basis of texts of scientific and engineering discourse have served as the material for analysis. This determined the relevance and novelty of the proposed study, since its subject is word formation, and in particular, the genesis of noun suffix morphemes, which, firstly, have not been previously considered when studying units of text corpora of technical specialties, and which, sec-

ondly, contribute to a more detailed description of scientific communication texts.

**Aim. Tasks.** The goal of the article is as follows: to describe the results of a brief genetic analysis of the suffixes found with nouns in the English technical texts of the specialties Chemical Engineering (CE), Electrical Engineering (EE) and Automotive (AM) and then compare them (results) in order to indicate differential and integral characteristics in noun suffixes of these three text corpora. The goal states the following tasks: to present a real inventory of noun derivational suffixes found in printed English texts of scientific communication; to determine to what extent the difference or similarity of the scientific topics of the studied text corpora affects the genetic component of noun suffix morphemes.

**Methods and material.** In the course of researching such methods were applied. First of all for correct distinguishing the list of suffixes the authors used so-called interlinear glossing method, and specifically the morpheme-by-morpheme correspondence method, which is considered in rule No. 2 of the Leipzig Glossing Rules (Leipzig Glossing Rules) [12] where each word form is divided into morphemes, and each morpheme is provided with translation. Currently most international linguistic publications use this particular technique. In addition the work by H. Marchand [4] was taken to confirm the results of the analysis made in accordance with the Leipzig Glossing Rules [12].

The interaction of language and speech which is the theoretical basis of the given article requires the usage of not only text corpora but also the appeal to normative dictionaries containing etymological data. That is why the normative dictionary Webster's Third New International Dictionary [13] was included in the list of necessary literature.

To understand in which of the chosen specialties text corpora the derivational noun suffixes occur most frequently the statistical and mathematical methods of calculation were involved in the analysis.

The electronic text corpora of the English technical specialties – Chemical Engineering (CE), Electrical Engineering (EE) and Automotive (AM), based on the articles of the scientific journals of the

United Kingdom and the USA, was used as a material of the research: Chemical Engineering – Chemical Engineering Progress, Chemical and Process Engineering; Electrical Engineering – IEEE Transactions on Power Apparatus and Systems, Proceedings of the Institution of Electrical Engineers; Automotive – Automobile Engineering, Auto Industry; Automotive News; Combustion; Control and Optimization; Machine Design; Industrial and Production Engineering; Automotive Engineer.

**Discussion.** Based on the classification by H. Marchand [4] and morpheme-by-morpheme correspondence method, all nominal suffix morphemes were divided into three groups according to their origin: Germanic, Romance and Greek. Here it is also appropriate to provide quantitative data since the main characteristics of various types of discourses are created not so much by stylistically marked means but by the different frequency of use of certain language units.

So in the text corpus “Chemical Engineering” (CE) there are 5 suffixes of Germanic origin in 88 lexemes with a total frequency of use 3628 units; 19 suffixes of Romance origin in 197 lexemes with a total frequency of use 10049 units; and 3 suffixes of Greek origin in 9 lexemes with a total frequency of use 294 units.

In the sublanguage “Electrical Engineering” (EE) there are 5 suffixes of Germanic origin in 57 lexemes with a total frequency of use 2221; 15 suffixes of Romance origin in 231 lexemes with a total frequency of use 11073 units; 2 suffixes of Greek origin in 3 lexemes with a total frequency of use 241 units.

In the text corpus “Automotive” (AM) there are 5 suffixes of Germanic origin in 106 lexemes with a total frequency of use 3579 units; 16 suffixes of Romance origin in 199 lexemes with a total frequency of use 8480; and 1 suffix of Greek origin in 3 lexemes with a total frequency of use 529 units.

1. Native (Germanic origin) suffixes. The nomenclature of such suffixes in the analyzed text corpora turned out to be the same for all specialties: *-er*, *-ing*, *-ness*, *-ship*, *-th*. There are almost four times fewer of them than the borrowed ones, but in terms of productivity and frequency of use the original morphemes are not inferior to foreign ones.

One of the most productive suffixes in the English language is the native noun suffix – *-er*. This suffix has been known since ancient times as an agentive suffix, denoting a person, a figure in his profession, according to the action he performs or the state at the time of speech, as well as a person belonging to a certain area. With the development of science and

technology, the suffix *-er* also acquires the abstract meaning of “instrumentation”, giving a number of names of tools, instruments, devices that perform the operations indicated in the basis of this word.

In the studied text corpora the frequency of the use of the agentive meaning of the suffix *-er* is low. So, in the texts of CE and EE it forms only 4 agentive nouns: *engineer*, *customer*, *designer*, *user*; however, in the texts of AM we already meet 13 agentive nouns: *engineer*, *designer*, *worker*, *partner*, *researcher*, *customer*, *consumer*, *automaker*, *builder*, *driver*, *dealer*, *passenger*, *owner*.

Most noun-terms created with the suffix *-er* have the abstract meaning “instrumentation”. In the CE corpus, for example, 43 such terms are registered: *exchanger*, *settler*, *cooler*, *vaporiser*, *atomiser*, *crystalliser*, *impeller*, *extruder*, *blower*, *clarifier*, etc. There are 39 such terms in the AM text corpus: *adapter*, *converter*, *cleaner*, *damper*, *holder*, *starter*, *runner*, *bumper*, *analyzer*, *changer*, etc. In the EE texts, which have a poorer terminological system in terms of this meaning, 29 nouns with the meaning “instrumentation” were identified: *autotransformer*, *amplifier*, *divider*, *feeder*, *rectifier*, *diverter*, *interrupter*, *recloser*, etc.

The frequency of the suffix *-er* is the highest among suffixes of Germanic origin. For example, the frequency of repetition of lexemes formed by the suffix *-er* in printed texts of all three studied text corpora is more than half of all lexemes with native suffixes.

The second in terms of productivity and frequency in the inventory of native suffixes is the suffix *-ing*. In the CE texts it designs 36 lexemes, the repetition frequency of which is 1076 units. In the AM corpus the suffix *-ing* forms 46 lexemes used with the frequency 1148 units, in EE – 22 lexemes with the frequency 622 units.

The suffix *-ing* is used in the studied texts of scientific communication mainly as a factor in creating polysemy. It occurs in nouns denoting: 1) process: *cracking*, *loading*, *cooling*, *backing*, *molding*, *firing*, *welding*, *breating*, etc.; 2) an object, detail or material: *casing*, *tubing*, *bushing*, *wiring*, *tower-footing*, *building*, *ducting*, etc. 3) an abstract concept: *handling*, *processing*, *saving*, *styling*, etc.

Thus we can conclude that two native suffixes *-er* and *-ing* form 91–94 percent of all lexemes with Germanic suffixes and 94–96 percent of all uses of native suffixes found in these technical texts.

The suffixes *-ness*, *-ship*, *-th* show neither systemic nor textual activity in any text corpora. Their frequency and productivity are so small that their numerical characteristics can be negligible and they were not considered in the analysis.

2. Borrowed suffixes (Roman and Greek origin). In English, as is known, there are much more borrowed suffixes than the native ones [4; 13; 14]. This pattern is also preserved in the texts of the scientific and engineering discourse. For example, in the text corpora of the technical specialties “Chemical Engineering”, “Automotive”, and “Electrical Engineering”, there are almost four times more borrowed suffixes.

The inventory of borrowed suffixes consists mostly of suffixes of Romance origin as already mentioned above. There are 19 of them in the CE texts, 16 each in AM and EE. 14 morphemes of them, i.e. the most, are common to all threetext corpora: *-ion/-tion/-ation*, *-ity/-ty*, *-or*, *-ment*, *-ance/-ence/-ency*, *-age*, *-ure*, *-al/-ial*, *-ant/-ent*, *-ary/-ery*, *-y*, *-ive*, *-able*, *-ice*.

The group suffix *-ion/-tion/-ation* ranks first in terms of productivity and frequency of use in the inventory lists of text corpora of scientific and engineering discourse which is also confirmed by other researchers (Погачева, Трофимова). The high activity of the suffix *-ion/-tion/-ation* is probably due to its relatively easy digestibility by nouns designed to satisfy the need to express even more variations of abstract meanings: 1) process: *action*, *filtration*, *ionisation*, *preparation*, etc.; 2) condition or quality: *application*, *limitation*, *fluctuation*, *insulation*, etc.; 3) a specific result of an action: *correction*, *reduction*, *addition*, *computation*, *reflection*, *utilisation*, etc.

Other suffixes of Romance origin are also productive and function with high-frequency: *-ity/-ty*, *-ment*, *-ance/-ence/-ency*, *-or*, *-age*.

The suffix *-ity/-ty* is found in nouns that function in the texts of the studied scientific literature, with abstract meanings: 1) states, positions: *density*, *capability*, *conductivity*, etc.; 2) qualities, properties: *property*, *linearity*, etc.;

The suffix *-ment* forms nouns denoting: 1) process: *measurement*, *movement*, *adjustment*, etc. 2) condition, quality or condition: *requirement*, *acknowledgment*, etc.; 3) something concrete or material: *equipment*, *attachment*, etc. However, it is worth adding that the number of nouns that have the abstract meaning “something concrete”, “something material” is small.

The suffix *-ance/-ence/-ency* occurs in nouns denoting: 1) condition, quality: *difference*, *emergency*, *existence*, *clearance*, etc.

The suffix *-age* occurs in abstract nouns with meanings: 1) the results of the action: *leakage*, *creepage*, etc.; 2) units of measurement: *percentage*, *mileage*, etc.; 3) a specific subject: *linkage*, etc.

In the inventory of suffixes of Romance origin functioning in the text corpora of three technical spe-

cialties only one suffix morpheme is registered, giving nouns an abstract meaning “agency” and “instrumental” *-or*. In the studied texts a large number of nouns by adding the suffix *-or*, acquired the meaning “tool”: *precipitator*, *accumulator*, *resistor*, *simulator*, *insulator*, etc. With the meaning “agency” this suffix is registered only in the two nouns: *contractor*, *operator*.

Suffix morphemes of Greek origin *-ic*, *-is*, *-one* creat a total of only six nouns. Two of them are quite actively used in the analyzed text corpora since they denote the most frequent scientific concepts related to research – ‘analysis’ – in the “Chemical Engineering” texts it is registered 73 times, “Automotive” – 191 times, “Electrical Engineering” – 98 times; ‘characteristic’ – respectively, 89 times, 163 times and 119 times.

**Conclusions.** The results described allow to make the following conclusions. The inventory of noun suffix morphemes functioning in the studied text corpora of the scientific and engineering discourse has the following content: a) native (Germanic) suffixes – 5 units in all three text corpora; b) suffixes of Romance origin in the corpus “Chemical Engineering” 19, in the corpora “Automotive” and “Electrical Engineering” – 16 each, 14 suffix morphemes of them are common to all three specialties: c) 3 suffixes of Greek origin in all three corpora.

Genetic analysis of noun suffix morphemes found in the analysed text corpora of scientific communication has shown that there are much fewer native suffixes in the English texts of engineering than the borrowed ones. However, they are actively involved in the formation of nouns, giving them, basically, the abstract meaning “instrumentation”. The high activity of suffixes of Germanic origin is evidenced by the fact that they created a third of nouns in the text corpora “Chemical Engineering” and “Automotive” and the fifth part – in the “Electrical Engineering” texts.

Suffixes of Romance origin occupy a dominant position in the suffix word formation of nouns in the studied corpora. They form 65-67% of all suffix nouns in CE and AM and 79% in EE. A characteristic feature of suffixes of Romance origin is their high ability in creating the nouns with abstract meanings “process”, “state”, “result of action”.

Suffixes of Greek origin occur only in several words.

Considering the possible dependence of the frequency of use of noun suffix morphemes of various origins with a certain meaning on such an extra linguistic factor as scientific specialty the authors came to the conclusion that such a dependence exists, and it is of differential nature. First of all this is observed

in the degree of influence that the original suffixes have on the word formation of nouns. For example, with the help of the suffix of Germanic origin *-er*, the most of the noun-terms were created that have the abstract meaning of “instrumentation” and which are included in the terminological systems “Chemical engineering” and “Automotive”. The specialty “Electrical Engineering” does not have in its system of scientific concepts a large number of objects associated with the meanings of “instrumentation”, so the

frequency of the use of nouns with suffixes of this meaning is much less here.

However, in the end, an integrating trend is observed in the study of the genesis of nouns with native noun suffixes, i.e. in all three text corpora, the two native suffixes – *-er* and *-ing* have almost the same proportion of all uses of native suffixes.

When carrying out a genetic analysis of the borrowed suffix morphemes it was traced, basically, the presence of integral characteristics in all three text corpora.

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