

Interdisciplinary Polysemous Terms and their Representation in Explanatory Dictionaries

KHUDOYBERDIEVA GULMIRA ALLABERDIKIZI

Termez State University, Termez, Uzbekistan

ABSTRACT

This study examines interdisciplinary (cross-domain) polysemous terms terminological units that are formally identical but correspond to distinct concepts within the term systems of different sciences. Using material from Uzbek (operatsiya, reaksiya, funktsiya, korpus, kanal, signal, virus) alongside the Russian and English terminological literature, the research investigates the mechanisms that give rise to such cross-domain polysemy and asks how it should be distinguished from genuine interdisciplinary terminological homonymy. The study applies descriptive, comparative-terminological, and lexicographic analysis methods. The study concludes that explanatory dictionaries should represent interdisciplinary polysemous terms not as a set of unrelated homonyms but as a single entry whose domain-specific meanings are explicitly marked and traced back, where possible, to their motivating common source.

Keywords: Interdisciplinary polysemy, terminological homonymy, transterminologization, conceptual metaphor, terminography, Uzbek linguistics.

1. INTRODUCTION

Interdisciplinary, or cross-domain, terms are terminological units that are formally identical that is, share the same phonetic and graphic shape but correspond to different concepts within the term systems of different sciences. Uzbek material illustrates this

phenomenon clearly: *operatsiya* functions as a term of medicine, military affairs, banking, and mathematics/computer science; *reaksiya* belongs to chemistry, physiology, and socio-political discourse; *funksiya* is used in mathematics, biology, linguistics, and sociology; and *korpus* appears in military affairs, anatomy, engineering, and linguistics. Comparable units include *kanal*, *signal*, *virus*, *model*, and *indeks*. In the explanatory dictionary of Uzbek (O'TIL), such units are given with several domain labels and several definitions, which makes their underlying nature an important question for the lexicographer.

Chistyukhina describes interdisciplinary polysemy as a multi-meaning term that is used within the specialized knowledge of different fields but whose meanings retain a direct or indirect connection to one another (Chistyukhina 2011). On the basis of dissertation research, she draws several conclusions relevant to the present study: cross-domain polysemes may occur even among fields that are not otherwise connected; cross-domain polysemy may persist even where the meanings concerned share no obvious common seme; in the current stage of English-language terminology, words of Greek and Latin origin constitute a major source of such polysemes; the principal mechanism by which cross-domain polysemy arises is metaphorical transfer of meaning; and structural analysis shows that cross-domain polysemes occur most frequently among simple, underived terms (Chistyukhina 2011).

Reformatsky referred to polysemous terms belonging to different terminological fields as "interdisciplinary (cross-field) terminological homonyms" (Reformatsky 1996). Distinguishing interdisciplinary polysemy from interdisciplinary terminological homonymy proper therefore requires close attention: terminological homonymy proper involves an essentially accidental coincidence of sound and form between otherwise unrelated words, whereas interdisciplinary polysemy involves a system in which traces of hierarchy and mutual influence between the domain-specific meanings can still be observed. The formation of homonyms is accordingly a complex, multi-stage process governed by phonetic, morphological, and other factors, unfolding under the influence of the historical development of

the language and of individual lexical units, in which two formerly separate words converge independently while their meanings remain otherwise unchanged.

Both interdisciplinary polysemy and terminological homonymy involve a change in a term's meaning across different fields, yet they differ in how they arise and in their consequences for cooperation across disciplines: where the two share an underlying motivation, the result is better described as polysemy, and where that motivation is absent, the result is better described as homonymy. Methodologically, it is therefore important to distinguish cross-domain polysemy, in which the meanings are linked by a shared semantic invariant, from cross-domain homonymy, in which that link has been lost. Chistyukhina's research into present-day English terminology shows that cross-domain polysemes are not a random occurrence but a systematic phenomenon of the terminological lexicon (Chistyukhina 2011).

Given this background, the present study sets out the following objectives: (1) to identify the principal mechanisms that give rise to interdisciplinary polysemy, drawing on both the general terminological literature and concrete Uzbek material; (2) to clarify the criteria that distinguish interdisciplinary polysemy from interdisciplinary terminological homonymy; and (3) to determine how interdisciplinary polysemous terms ought to be represented in explanatory dictionaries, with particular reference to the practice of the explanatory dictionary of Uzbek.

2. MATERIALS AND METHODS

The material for this study consists of interdisciplinary terms attested in the explanatory dictionary of the Uzbek language (O'TIL), supplemented by terms documented in Russian and Uzbek terminological dictionaries of the technical and international lexical layer, including the Russian–international explanatory dictionary compiled by Usmonov and Doniyorov (1965). The core Uzbek dataset comprises the terms *operatsiya*, *reaksiya*, *funksiya*, *korpus*, *kanal*, *signal*, and *virus*, each of which is attested with distinct meanings across two or more specialized fields. Theoretical material was drawn from the

general terminological and cognitive-semantic literature, including the works of Reformatsky (1996), Leychik (2009), Grinev-Grinevich (2008), Lakoff & Johnson (1980), Kövecses (2010), and Temmerman (2000), and from studies specific to the Uzbek terminological lexicon, including Doniyorov (1977), Begmatov (1985), and Madvaliyev (2017).

The study applies three complementary methods of analysis.

1. **Descriptive method:** Used to identify interdisciplinary polysemous terms in Uzbek and to describe, for each term, the set of domain-specific meanings attested in dictionary sources and in specialized usage.
2. **Comparative-terminological method:** Used to compare the domain-specific meanings of a given term in order to determine whether they are linked by a common etymological source, a shared conceptual core, or a regular metaphorical or metonymic mapping, or whether the link between them has been lost that is, to distinguish interdisciplinary polysemy from interdisciplinary terminological homonymy. This method draws on the conceptual metaphor framework of Lakoff and Johnson (1980) and on Kövecses's (2010) account of the systematicity of source and target domains, and underlies the analysis of the five groups of causal mechanisms presented in the 'Results and Discussion' section.
3. **Lexicographic analysis:** Used to examine how interdisciplinary polysemous terms are represented in the explanatory dictionary of Uzbek specifically, whether domain-specific meanings are given within a single entry with multiple field labels, as the principle of motivated polysemy would suggest, or split across separate homonym entries and to compare this practice with the treatment of equivalent international terms in Russian lexicographic sources.

On the basis of these methods, five groups of mechanisms underlying interdisciplinary polysemy were identified and systematized: historical-genetic mechanisms (a shared classical

root combined with parallel terminologization), cognitive-semantic mechanisms (metaphorical and metonymic transfer), transterminologization (the historical migration of a term from one term-system into another), the influence of interdisciplinary integration in contemporary science, and linguo-economic and sociolinguistic factors (the economy principle of language together with the prestige of scientific style and the role of an intermediary language). Each mechanism was then tested against the Uzbek terminological material described above.

3. RESULTS AND DISCUSSION

3.1. *Historical-genetic causes: a shared etymological source and parallel terminologization*

The first group of causes is connected with the way scientific terminology has been enriched from the Greco-Latin fund. Most interdisciplinary terms trace back to Latin or Greek bases whose original meaning was abstract and relational, which allowed the same base to serve the concepts of many subject fields. The Latin *operatio* (“action, performance”), *reactio* (“counter-action”), *functio* (“performance, execution”), *corpus* (“body”), and *canalis* (“pipe, channel”) are all semantically broad words capable of serving the concepts of many subject domains. When several sciences draw on exactly the same classical root at roughly the same period in order to name their own specialized concepts, a parallel (independent) terminologization of one form takes place: each science concretizes the common abstract meaning according to its own needs.

Uzbek material reflects this pattern directly, since the terms in question entered Uzbek already bearing the cross-domain polysemy of their Latin or international source. *Operatsiya* in medicine (a surgical operation), in military affairs (a planned campaign), in banking (a financial transaction), and in mathematics/computer science (a defined procedure on data) all preserve the shared core of “a purposeful, defined action carried out to achieve a result,” even though each field has narrowed this core differently.

3.2. *Cognitive-semantic mechanisms: metaphorical and metonymic transfer*

The second, deeper group of causes concerns the cognitive nature of term formation itself. According to conceptual metaphor theory, the everyday conceptual system in terms of which people think and act is fundamentally metaphorical in nature, and the essence of metaphor is understanding and experiencing one kind of thing in terms of another (Lakoff & Johnson 1980). Metaphor, in this view, is not a mere ornament of speech but a fundamental mechanism of thought that allows one (typically abstract) conceptual domain to be understood through another (typically more concrete, more physically grounded) domain. It is precisely this mechanism that underlies the migration of a term from a “donor science” to a “recipient science”: a new specialized concept is grasped by analogy with an already familiar concept, and the form already attached to that familiar concept is carried over with it.

This transfer proceeds along two paths. Metaphorical transfer (a mapping across different domains) is seen in the Uzbek *virus*: the biological agent capable of infecting and multiplying within a host supplies the model through which a *kompyutervirusi* (“computer virus”) is understood, since the harmful program is conceptualized as an agent that “infects” and “replicates” within a system in the same way a biological virus does. Metonymic transfer (a mapping within a single domain, based on contiguity) accounts for some of the meanings of *operatsiya*, where the relations “process → result” or “action → object of the action” connect a banking operation as an activity with the resulting transaction record. Kövecses (2010) emphasizes precisely this kind of systematicity between source and target domains and its role in shaping terminological meaning.

Of particular importance for terminology is Temmerman’s (2000) sociocognitive approach, which, on the basis of material from the life sciences, shows that polysemy and metaphorization are not a defect of special-purpose language but a functional property of it: synonymy and polysemy are functional in language for special purposes, and a diachronic approach to them is unavoidable (Temmerman 2000). On this view, the cross-

domain polysemy of terms such as *funksiya* or *reaksiya* in Uzbek is not an accident to be eliminated by standardization but an expected outcome of how specialized vocabularies actually grow.

3.3. Transterminologization: Interdisciplinary borrowing

The third group of causes is the historical adoption of a term that already belongs to one science by another science. Russian terminology studies refer to this phenomenon as transterminologization – the transfer of a term from one term-system into another, together with its reinterpretation and consolidation in a new specialized meaning. Within his conception of the term as the “substrate” of a specialized unit, Leychik (2009) describes the migration of terms between different term-systems as one of the regular ways in which new terms come into being.

Rizhenkova (2001) shows that transterminologization is an effective means of enriching field-specific term-systems and that the phenomenon is both a result of, and a counterpart to, the processes of integration and differentiation of scientific knowledge: the appearance of interdisciplinary homonyms testifies to the differentiation of the sciences, whereas interdisciplinary terms themselves are a sign of the integration of knowledge, especially in the practical application of economic, ecological, military, medical, and transport knowledge (Rizhenkova 2001). Grinev-Grinevich (2008) systematizes the types of such borrowing and introduces the notion of “recruited terms” for units that have been drawn into a new term-system in this way.

Uzbek material offers clear instances of transterminologization. The banking and military meanings of *operatsiya* result from transterminologization of the Latin *operatio* in different directions at different historical moments; the linguistic meaning of *korpus* (“a body of texts”) is a comparatively late terminological borrowing, layered on top of the earlier military and anatomical meanings of the same form.

3.4. *Interdisciplinary integration as a contemporary factor*

The fourth cause is socio-epistemological in character. Contemporary science develops through the convergence of disciplines and the emergence of hybrid fields such as bioethics, bioinformatics, neurolinguistics, and ecological economics. Each such field draws into its own term-system the concepts and terms of neighboring sciences. As Kedrov observed, increasingly often “a single subject must be studied jointly, in interaction, by a great many sciences” (as cited in Rizhenkova 2001). If the emergence of interdisciplinary terms is a linguistic sign of the integration of knowledge, the parallel emergence of interdisciplinary homonyms is correspondingly a sign of the differentiation of the sciences.

In Uzbek, this factor is reinforced by state policy on terminology standardization and by the rapid growth of the lexicon under the pressure of globalization and integration (Madvaliyev, 2017). The continued spread of terms such as *model* and *indeks* into ever more specialized Uzbek subfields economics, sociology, information technology illustrates this integrative pressure in real time.

3.5. *Linguo-economic and sociolinguistic factors*

The fifth group of causes is connected directly with the nature of language itself. Language is subject to a general economy principle: rather than creating a new form for a new concept, language prefers to load an existing, familiar form with a new meaning. Martinet described this economy as the result of two opposing forces, namely a constant conflict between human communicative needs and the human tendency to minimize mental and physical effort, which can be regarded as the driving force of linguistic change (Martinet 1964). For terminology, this means that a ready-made international term with a transparent internal structure is “cheaper” than coining a neologism, which is precisely why interdisciplinary polysemy is reinforced.

Sociolinguistic causes include the prestige of the scientific register, the influence of international scientific communication, and standardization. Averbukh (2006) identifies at least five tendencies in the development of languages for special purposes:

integration, differentiation, internationalization, unification, and economy (the operation of the economy principle). As a result of internationalization, one and the same internationalism becomes established simultaneously within several national term-systems and within several fields at once. For Uzbek, the role of an intermediary language has been decisive: the overwhelming majority of interdisciplinary international terms entered Uzbek through Russian, a fact documented in the Russian-international explanatory dictionary of Usmonov and Doniyorov (1965). Doniyorov (1977), working with technical terminology, demonstrates the leading role of this Russian-international layer, while Begmatov (1985) characterizes the international layer within the broader lexical strata of the Uzbek literary language. For this reason, Uzbek *operatsiya*, *reaksiya*, *funksiya*, *korpus*, *kanal*, *signal*, and *virus* are phonetically and graphically adapted on a Russian model, while preserving the full “fan-like” cross-domain polysemy already present in the source language.

3.6. *Implications for lexicographic representation*

Taken together, the five groups of mechanisms examined above show that the domain-specific meanings of an interdisciplinary term are, in the large majority of cases, not accidental but motivated: they trace back to a common etymological source, are connected by a regular metaphorical or metonymic mapping, or have entered the language together as a single act of transterminologization. This has a direct consequence for lexicographic practice. If a lexicographer encounters a form such as *operatsiya* or *funksiya* attested with several field-specific meanings, the analysis above indicates that the unit should, in principle, be treated as a single polysemous entry with multiple domain labels, rather than split into separate homonym entries, provided that the motivating link between the meanings can be reconstructed or is still synchronically perceptible to specialists.

At the same time, the analysis suggests a limiting case. Where the historical link between domain-specific meanings has been severed so completely that even specialists in the two fields perceive no connection at all the situation Reformatsky (1996) had in mind in speaking of “interdisciplinary terminological

homonyms” separate entries become justified. The boundary between the two cases is not always sharp, and the explanatory dictionary of Uzbek (O‘TIL) currently resolves it pragmatically, by listing the domain-specific senses of a form such as *korpus* within one entry distinguished by field labels (military, anatomical, technical, linguistic) rather than by separate Roman-numeral headwords, which is consistent with treating these units as interdisciplinary polysemes rather than homonyms.

4. CONCLUSION

Based on the discussion above, several conclusions may be drawn.

1. First, interdisciplinary polysemous terms illustrated in Uzbek by *operatsiya*, *reaksiya*, *funksiya*, *korpus*, *kanal*, *signal*, and *virus* are a systematic rather than accidental feature of the terminological lexicon, occurring most frequently among simple, underived terms of classical origin.
2. Second, five groups of mechanisms jointly explain the emergence of such polysemy: a shared etymological source combined with parallel terminologization; cognitive-semantic transfer through metaphor and metonymy; transterminologization, that is, the historical migration of a term from one term-system to another; the broader process of interdisciplinary integration in contemporary science; and linguo-economic and sociolinguistic factors, including the economy principle of language and the role of an intermediary language such as Russian for Uzbek.
3. Third, interdisciplinary polysemy must be kept distinct from interdisciplinary terminological homonymy: the former preserves a motivated link between domain-specific meanings, however indirect, while the latter reflects an essentially accidental coincidence of form between unrelated terms. The emergence of interdisciplinary homonyms signals the differentiation of the sciences, while the emergence of interdisciplinary polysemes signals their integration.

4. Fourth, this distinction should be reflected in lexicographic practice: an interdisciplinary term whose domain-specific meanings remain motivated by a common source should be represented as a single dictionary entry with multiple field labels and definitions, rather than as a set of unrelated homonymous entries. Refining the criteria for this decision, and applying them consistently across entries, remains an important task for the explanatory dictionary of Uzbek and for terminography more generally.

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KHUDOYBERDIYEVA GULMIRA ALLABERDIQIZI

DOCTORAL STUDENT,
TERMEZ STATE UNIVERSITY,
TERMEZ, UZBEKISTAN.

E-MAIL: <GULMIRAKHON91@GMAIL.COM>