How do you fish lexicographic pearls out of a terminological sea via a semantic net? – The thesaurus as an interdisciplinary exponent of specialist knowledge

Iwona Drabik

Warsaw School of Applied Linguistics

Abstract

Notwithstanding a significant advancement in research on translation studies over the last three decades, a need for facilitating the interlingual transfer of knowledge in the professional communication channel still remains unsatisfied. This paper ventures to examine the theoretical aspects of the final and most complex stage of the translation process, i.e. the compilation of a thesaurus comprising a set of specialist terms, and to position it on an interdisciplinary map of human cognition. As the term *thesaurus* still does not seem to have been encapsulated within one incontestable definition, there is a wide spectrum of available interpretations, the majority of which may be synopsized into three linguistic approximations: (1) cognitive, focusing upon the innate hard-wired hypothetical models accounting for a human's predisposition for mental development; (2) textological, where the language is materialized as a textual unit; and (3) semiotic, casting a structuralist light upon language as it is construed as a system of signs forming a specific communication code.

Key words: thesaurus, cognitivism, textology, semiotics, semantic network

Abstrakt

Pomimo znacznych osiągnięć zarejestrowanych w dziedzinie przekładoznawstwa na przestrzeni ostatnich trzech dekad, proces interlingwalnego transferu wiedzy w kanale komunikacji zawodowej wciąż pozostawia poczucie intelektualnego niedosytu. Celem artykułu jest analiza finalnego etapu procesu tłumaczenia, zmierzającego ku skonstruowaniu tezaurusa terminów specjalistycznych, który w porównaniu z pozostałymi fazami translacji wykazuje największą kompleksowość i najwyższy poziom kompresji tekstowej. W artykule zostaje podjęta próba umiejscowienia badanego narzędzia leksykograficznego na interdyscyplinarnej mapie poznania ludzkiego. Ze względu na fakt, iż pojęcie *tezaurusa* nie zostało jak dotąd zdefiniowane w sposób jednoznaczny, a jego pole semantyczne nadal posiada charakter fluktuacyjny i cechuje się nieregularną dynamiką, postanowiono przyjąć trzy perspektywy badawcze: (1) poznawczą, zakładającą istnienie wrodzonego kognitywnego potencjału predysponującego człowieka do dalszego rozwoju intelektualnego; (2) tekstologiczną, w przypadku której język ulega materializacji, przyjmując postać szeroko pojętych tekstów, oraz (3) semiotyczną, według której język w ujęciu strukturalistycznym pojmowany jest jako system znaków, konstytuujący określony kod komunikacyjny.

Keywords: tezaurus, kognitywizm, tekstologia, semiotyka, sieć semantyczna

A variety of denotata and designata are attributable to the term *thesaurus*, which gives rise to considerable divergence in determining the nature, extent and scope of the notion concerned. Within the remit of lexicography the expression under study may be specified as referring to either a mental system of highly advanced idiosyncratic knowledge or a materialized system of terms, i.e. exteriorization of an idiolectal conceptual grid taking the form of a human-specific specialist text (Nagórka 2009: 224-5). Consequently, a specialist text may be defined as a representation of a particular technolect within a professional communication channel, where a terminological lexicon is linearly introduced into a syntagmatic sequence in accordance with syntactic rules. Reiterated and reformulated manifold times in the literature, the term *thesaurus* deserves a more heterogeneous inspection, which will here be vigilantly conducted against the kaleidoscopic backdrop of (1) cognitivism, (2) text linguistics and (3) semiotics.

A cognitive compass in a lexicographic labyrinth

One of the key topics challenging a lexicographer's mind is an irrefutable entanglement of human language, knowledge and thought, which entails an in-depth analysis of the accurate organization of a conceptual system as it reflects a given theoretical framework. The proper generation of a semantic structure, prior to the naming of concepts, constitutes the departing point for the onomasiological process of applied terminology. Thus, a thesaurus may be credited as an extension of a meticulously woven net, the architectonics of which is grounded upon a set of semantic nodes, i.e. conceptual units representing distinguished mental spaces and upon the respective mappings established between them (Evans and Green 2006, 368-369). Any arduous attempts at exteriorizing the specialist knowledge, deeply-rooted in one's brain, in a form which would faithfully represent the conceptual scaffolding of knowledge configuration, resembles a continuous cycle of approximating and distancing the proverbial dichotomy of form and content. Yet the possibility of reproducing the external image of knowledge with any completeness or precision is so limited that it may be virtually nonexistent.

From a cognitive perspective, a thesaurus constitutes a carefully designed information unit which stands for a perfectly erected conceptual framework composed of meaningful items conveying specialist knowledge and forming a semantic grid. The structure of each semantic net is determined by basic concepts (disguised in a verbal, i.e. terminological, coating), first order derivative terms, and second order derivative terms. Apparently, first order derivative terms are regular due to their direct and unambiguous relations to basic terms, whereas the second order derivative terms are implied from the multilaterality and multidimensionality of semantic interrelations (Lukszyn 2009, 11).

A sample visualization of a semantic grid is depicted in Figure 1, where the scrupulously designed net covering the field of morphology may be compared to a galaxy or star constellation, the main layers of which are designated by terminological units.

A wide array of cognitive operations as well as emotive, volitive and conative processes conducted at the level of consciousness may be defined in compliance with the major tenets of the information processing theory. According to the cybernetic model by Weaver and Shannon, the information is deemed a manifestation of an energy quantum materialized within the boundaries of the energetic system under study (Weaver and Shannon 1964, 8-9). The overall brain activity, commonly construed as the information processing, arises from the everyday functioning of a nervous system strenuously attempting at transmitting nerve impulses and secreting chemical substances along the synapses. In light of the

SEMANTIC GRID

Basic terms

A	*lexeme*
B	*morpheme*
Δ	*concept*

First order derivative terms

α	*stem*
β	*derivation*
δ	*term*

Second order derivative terms

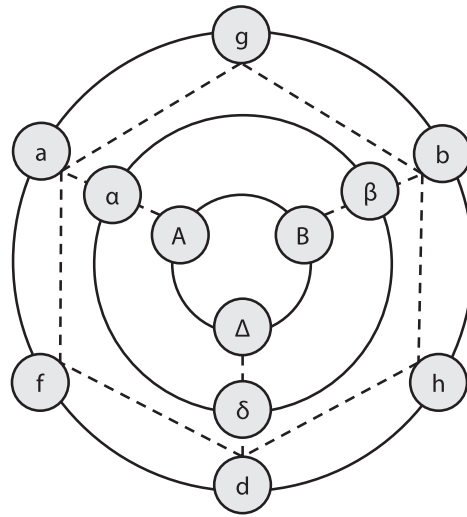|	
a	*apophony*
b	*reduplication*
d	*terminological paradigm*
f	*suppletion*
g	*ablaut reduplication*
h	*terminological doublets*

Figure 1. A sample semantic network for the realm of morphology

foregoing, the information may be interpreted as a scale measuring the extent to which a given portion of energy ultimately crystallizes in the communication channel. In all the physical, chemical and biological processes, the primarily amorphous fraction of energy adopts a specific shape, structure and configuration, or reflects the pre-determined relations between particles, concepts and notions. The fashion in which the message is transmitted and received is contingent upon the architectonics of an individual cognitive apparatus and perceptive capabilities with which both a sender and receiver are equipped.

However prolifically and insightfully described in a massive volume of scientific papers, the notion of *perception* (Latin *perceptio*) still incomputably oscillates within the liminal space of the human senses, yet it strives for a more metaphysical and extrasensory interpretation transgressing the borders of human cognition. While adhering to a commonly approvable explication, perception is comprehended as the process of an active reception, analysis and interpretation of sensual stimuli in which the information reaching the recipient's cognitive apparatus is processed against the background of commonsense knowledge registered and stored in one's memory. The fact that human sensations and experiences are far from being summarized as a motionless endeavour to inertly reconstruct the features of the physical world is conditional upon the active and volatile nature of a perceptive system. Admittedly, a productive dimension of perception enables one to accurately construe the external reality despite potential deficiency in data resulting from

e.g. physical disturbances such as noise, auditory irregularities, etc. One should not ignore the heuristic extent of a perceptive continuum, entailing the establishment of conjectural hypotheses which are subsequently verified through the prism of incoming data.

The foregoing speculations, predictions, and projections are based upon one's previous experience, which corroborates the validity of existing interconnections between perception and memorization. The object under perception fails to be a simplified ephemeral snapshot capturing the data received and analyzed at a given moment, but rather tends to funnel the processing of data, reaching one's cognitive apparatus, through the lens of one's mental filters, semantic frames, scripts and schemas. Thus, perception may be deemed an act of cognitive creativity, consisting in an active reception, integration and construal of sensations from the outside world (Hamlyn 1961; Kohler 1964; Hempoliński 1969; Ayer 1971; Kaufman 1979; Rock 1984; Merleau-Ponty 1986; Yolton 1996). Heterogeneous and multilateral as it is, a thesaurus constitutes an external substitution of one's mental states and images represented by terminological units within a particular specialist domain. The process of discriminating and differentiating terms is determined by the multi-level scale of consciousness, a prelude of which was introduced by Aristotle in ancient times. Scrutinized from a neurolinguistic perspective, understanding means creating an adequate mental representation of the meaning in the form of a conceptual network (Lukszyn 2007, 51-70).

Signals reaching a human brain are filtered through the prism of the cultural background, where the internalized knowledge, stereotypes, traditions and customs determine the way in which the above stimuli are perceived. Thus, culture becomes a measure of compatibility between a human being and the surrounding world, which laid foundations for such constructs as (a) lexical hypothesis (Galton 1884, 181), (b) the language picture of the world / naive picture of the world (Apresjan 2000, 4-8), or (c) linguistic relativity (Whorf 1956, 116), all of which propound the notion that numerous patterns of conceptualization inherent in any natural langue are linguistically determined and culture-specific. Therefore, a lexicographic work is considered as a linguistic portrayal of a given society, community or population, depending on the social group subject to a thorough lexical examination. The assiduous reconstruction of *naive pictures* of the surrounding reality, typical for each nation separately, results in the establishment of a multi-dimensional matrix of linguistic parameters immersed in the perpetual, aeonian and eternal discourse of ethnicity (Lukszyn and Zmarzer 2008, 10).

The web of signifieds (i.e. semantic nodes) which have their extensions taking the form of Saussurean signifiers (i.e. terms) and the net of rhizomatic connections between

them may be accounted for by parallel distributed processing models in which all forms of knowledge are represented within the network comprising neuron-like units (McClelland and Rumelhart 1981, 1985; Rumelhart and McClelland 1982). The interconnected patterns of concept-representing nodes enable an individual to organize meaningfully the knowledge contained within the set of connections (Sternberg 2014, 349). Every use of knowledge entails the reconfiguration and rearrangement of its constituents. Thus, knowledge representation is not as much a final product, but a process of its permanent reorganization. No particular pattern of connections is stored, but rather a pattern of potential excitatory or inhibitory connection strengths.

Upon its reception, the activation from the new information either intensifies or weakens the existing connections between those individual units that form the incumbent framework of knowledge. The ability to create new information by drawing inferences and making generalizations allows for a virtually infinite versatility in knowledge representation and manipulation (ibid. 351).

The foundation for such data processing is well-validated by a biological neural network, which may be defined as a series of interconnected neurons whose stimulation delineate a recognizable linear pathway. The interface through which neurons interact with their neighbouring units usually consists of several axon terminals connected via synapses to dendrites on other neurons. Assuming the sum of the input signals reaching one neuron surpasses a certain threshold, the neuron concerned sends an action potential and transmits the electrical signal along the axon. Lexicographically perceived, the neural circuit metaphor foregrounds the relevance of semantic nodes corresponding to neuronal cell bodies from which the message is transmitted via axons (semantic relations) to the dendrites of surrounding neurons that propagate the electrochemical stimulation over the network (Haykin 1999, 43-44).

Under textual scrutiny

Since each thesaurus is constructed upon a representative corpus of texts covering a particular domain, the conclusion seems inescapable that it is a highly condensed hypertext embodying all the common features displayed by the overarching majority of specialist texts representing a given professional area. The process of fishing these terms out leads to the systematic and hierarchical arrangement of terminological units and the reproduction of an overall semantic network. The final outcome shall be treated as an exponent of

a specific technolect within a professional communication channel, where a terminological lexicon is linearly inserted into a syntagmatic sequence in compliance with the predetermined syntactic rules.

With a large body of linguistic literature abounding with the definitions explaining the notion *text* (cf. Harweg 1968, 148; Hartmann 1971, 10; Mayenowa 1976, 191; Gülich and Raible 1977, 47; van Dijk 1977, 3; de Beaugrande and Dressler 1990, 31; Heinemann and Viehweger 1991, 126), placing an equality symbol between a text and a thesaurus is an outcome of the general understanding of what *text* actually is. A wealth of explications stipulated in numerous research projects confirms the multifarious approach towards *text* itself as well as the difficulties in designing one incontrovertible interpretation of it.

A text shall be treated as a reverberation of a mental reality that displays a high level of complexity, constituting a cognitive critical mass, composed of a series of thoughts, images, associations, emotions or feelings, covering a given constitution, the recipient's reactions, and the sender's intentions and self-control mechanisms (Hejwowski 2003, 195-196).

For the sake of brevity, the strata of textual analysis may be limited to three tiers: (1) At a preverbal level the text functions as a sender's intention or as a text *in statu nascendi* understood as an entity being at the stage of conversion from mentalese into a verbalized code. (2) A verbal level introduces the text acting as a linear sequence of linguistic signs, conveying a certain meaning, arranged in accordance with the formalized, grammatically conventionalized and proper intonational patterns (Lukszyn and Zmarzer 2009, 122-124). (3) The postverbal layer entails the application of various semiotic codes which are frequently far from representing the verbal system of signs, thus, are substituted by non-verbal, symbolic, ideographic means of exteriorizing knowledge, including but not limited to algebraic, geometric or symbiotic codes (compare the volume dedicated to the aesthetics of semiotic codes applicable for representing specialist knowledge – Zmarzer 2011). In order to underpin the complexity and advancement of cognitive derivation while processing the data extracted from a specialist domain, a thesaurus, by its very nature, should combine the verbal and postverbal components. Thus, a quantum of specialist knowledge which appears to be unconfinable within one single verbal term, may be expressed via a more symbolic metalanguage exhibiting a higher level of abstract sophistication.

Notwithstanding the degree to which the conceptual units have been processed and irrespective of the level within the three-tier model of a conceptual analysis presented

above, the examination of a text may be conducted in threefold steps, while adhering to the rules of cognitive introspection: (1) identification, (2) semantization and (3) interpretation, which has been depicted in the diagram below (Figure 2). Each stage requires separate scientific procedures determining the use of a specific metalanguage, and aims at addressing particular issues, which results in a practical algorithm instructing one as to the activities to be undertaken while dealing with informational units of whatever nature, including lexicographic works (Lukszyn 2008a, 190).
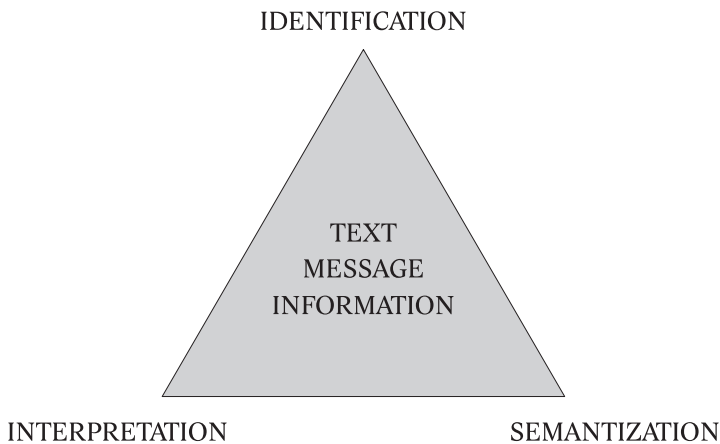
IDENTIFICATION

TEXT
MESSAGE
INFORMATION

INTERPRETATION   SEMANTIZATION

Figure 2. Consecutive stages of a textual analysis

The vertices of the above triangle open ample space for specific research questions which may be derived from the structure of a selected information unit, represented by a given thesaurus. The axis IDENTIFICATION → SEMANTIZATION illustrates the way in which a linguistic sign is introduced into a hierarchical conceptual structure, which implies the dissection of semantic relationships (hypernymy – hyponymy, entirety – meronymy, implicature – association) between the terms composing a dictionary under study. In other words, what is investigated within the approach above is a discursive and combining capacity exhibited by a term deployed among other terminological units.

The vector SEMANTIZATION → IDENTIFICATION depicts the manner in which a selected section of a reality is being portrayed by way of pre-determined linguistic signs, which fuels speculation concerning the relationships between Saussurean *signifieds* and *signifiers*, i.e. designation of verbal labels to specific concepts upon the conceptualization and categorization of the surrounding specialist reality (Evans 2007, 38; Lukszyn 2008b, 177; Zmarzer 2011, 195-196).

The relationship SEMANTIZATION → INTERPRETATION enables one to identify the meaning conveyed by a lexeme functioning in a specific lexicographic environment, i.e. to attribute a particular thought structure to a linguistic unit. As a result, the sense to be captured seems to be alterable depending upon its distribution and deployment amongst other lexemes. The meaning attribution hinges upon the architectonics of a recipient's mind, i.e. the hierarchy and arrangement of their internalized knowledge which is stored in one's memory at various levels in the form of cognitive structures, such as mind models, schemas, scripts, etc. (cf. Collins and Loftus 1975; Anderson 1976; Rumelhart and Ortony 1977; Schank and Abelson 1977; Rumelhart 1980; Dretske 1981; Langacker 1987; Jackendoff 1990).

The INTERPRETATION → SEMANTIZATION arrow positions a thesaurus, being a highly compact form of text, in a perpetual professional or ethnical discourse, i.e. resorts to the primary meanings reflected in traditional texts, such as fables, fairy tales, aphorisms, proverbs, etc. Such a tendency originates from the notion of intertextuality understood as a permanent interaction between textual units, where previously employed motives are interwoven in the tissue of the ensuing texts, which immerses them into a limitless cultural context (Kristeva 1969; Riffaterre 1978; Genette 1979; Culler 1981; Bachtin 1986). The research claims arising at that stage revolve around the idea of hypertextuality, which entails the diagnosing of all contextual presuppositions pertaining to the discipline under analysis and the depiction of a philological space within which a given text exists.

The INTERPRETATION → IDENTIFICATION direction allows for the overview of the vast repertoire of meanings and senses attributable to a lexeme in an open realm of professional discourse (Bachtin 1986, 523), where none of the linguistic units may be enshrined in one unequivocal sense. The difference in construing a given notion results from a variety of conceptual networks, into which a particular unit is inextricably intertwined and whose nodes activate heterogeneous senses of a *designatum* involved.

The IDENTIFICATION → INTERPRETATION vector emphasizes the changes to which a lexeme is subject. With the ubiquitous contradistinction concerning the actual meaning and alleged construction of an informational unit, i.e. *plurality of senses* vs. *plurality of interpretations*, a given message is trapped in an infinite loop of interpretations, which means that the sense may be re-deciphered an immeasurable number of times in an absolutely nonsaturable fashion. The subsequent receptions reorganize or modify the previously produced semantic net demonstrating the conceptual systematization of a text involved (cf. Eco 1994; Dobrzyńska 2001).

Each text is constructed in adherence to the laws of temporal and spatial linearity, which implies that the content may not be transposed from one utterance to another in a systemic and holistic way, but rather in a manner displaying order and successiveness. Cognitively speaking, one may distinguish three pivotal transposition/discursive techniques: (1) radial, (2) sequential and (3) telescopic.

With a radial technique, while creating the consecutive predicative units, one refers to the prior utterance in order to specify its message, which is presented in the following formula:

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        1a
         |
         1
        / \
      1b   1c
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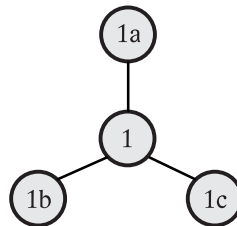
By means of a sequential transposition a message is transferred consecutively, i.e. from a previous predicative unit to the directly subsequent sentence in order to extend and unfold the idea under study:

$$(1) \rightarrow (1a) \rightarrow (a2) \rightarrow (2b) \rightarrow (b3) \rightarrow (...).$$

While transposing the message telescopically, the entire information is rendered to the next predicative unit acting as a *fully-fledged* proposition. Not only a selected component, but also the complete sentence is being transposed:

$$(1) \rightarrow (12) \rightarrow (123) \rightarrow (1234) \rightarrow (1234...n).$$

The type of thinking consists in the juxtaposing of mental units within a conceptual net (Lukszyn 2007, 51-70). Each line of intellectual reasoning is echoed by a particular kind of discursive structure which would enable one to exteriorize a semantic grid representing the knowledge configuration in the most faithful manner. Practical thinking reflected in appellative texts promotes a sequential transposition. For artistic lines of reasoning, fastidiously mirrored in expressive and emotive texts, a stylistic determinant is marked by a radial transposition, providing a valid point of departure for employing rhythmic and syntactic figures. Reproduced in referential texts, scientific reasoning is realized via a telescopic introduction of concepts in a syntagmatic sequence in a manner

furthering all the markers of textual cohesion and coherence. Religious thinking, on the other hand, is externalized by a merging of all of the above discursive structures, depending on individual preference and judgment (Zmarzer 2008, 83-84).

Assuming the above articulations were atomized through the prism of phylogenetic tenets, the only conclusion that would suggest itself is that the very basic and primary manner of text organization, reflecting a practical line of reasoning, is a sequential structure, which consequently lays foundations for a radial technique, indicating a higher complexity of cognitive operations and depicting the artistic pattern of conceptualizing reality. The two above types of discursive structures give rise to a religious thinking, being the merger of both radial and sequential relationships. The most faithful visualization of the scientific arrangement of data, involving the highest level of cognitive operations, realizes a telescopic technique within an academic discourse. Hence, each higher-ranking unit is composed of a lower-level unit supplemented by an additional component. A telescopic process represents a mental expansion and enlargement of knowledge, which may be figuratively compared to a *snowball effect*.

The above deliberations reflect the consecutive order of forming multifarious discursive structures within human cognitive development. The *sine qua non* condition for the well-grounded establishment of more advanced levels of human cognition is the solid formation of the basic cognitive pillars and mental rudiments. Gradually as they are formed, each further stage of cognitive development entails a higher degree of mental intricacy (Figure 3). Conversely, cognitive dexterity at the level of higher-ranking structures makes at the same time the lower-level intellectual operations more effective and automatic. The core of intellectual faculties may be epitomized by means of a telescopic transposition which underlines the complexity of mental processes carried out in the human brain.

Legend:

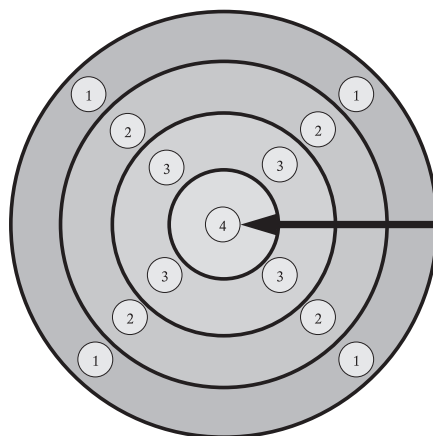| 1	►	Sequential structure
2	►	Radial structure
3	►	Mixed structure
4	►	Telescopic structure
←	►	The increasing level of cognitive complexity

Figure 3. The model of discursive structures depending on the complexity of mental operations

Acting as a linguistic and cultural intermediary, a translator/interpreter tends to serve a wide spectrum of functions, all of which may be synopsized into four major roles within the translation cycle, i.e.: (1) code switching, (2) reformulation, (3) adaptation, and (4) condensation.

1. Code switching, understood as a word-for-word translation from one language to another, due to the indexation of signifiers, displays the features of machine translation, i.e. literality, superficiality as well as a failure to interpret a deep structure of a text.

2. Reformulation, construed as the rewording or paraphrasing of the message received, otherwise known as an intralingual transfer, is an intermediary stage which enables a translator to express the message in a target language. Controversial as it may seem, it is one of the techniques used when translating verses into prose and striving to achieve "a precarious equilibrium" between poetry and prose (Lefevere 1975, 42).

3. Adaptation, entailing a shift in a cultural environment and introduction of a message into a new cultural framework, may be defined as a transgression beyond ethnical barriers. As a translation technique, it is applicable mainly to the rendition of religious, theological texts as well as folk tales. Numerous metaphors, symbols and archetypes interwoven into the textual layer require a higher level of linguistic processing, which will result in employing a mixture of discursive structures. Adaptation very often requires a more reflective kind of agency for the translator and makes them depart from the exigencies of equivalence.

4. Condensation applies chiefly to scientific texts and results in a visual representation of a selected discipline as a semantic grid of terms and their interrelations, i.e. the construction of a dictionary for specialist purposes. Professional knowledge represented by a thesaurus may be captured within a three-tier model, where the first stratum is composed of primary concepts, the second layer consists of derivative terms, and the third level is constituted by a net of semantic relations reflecting a particular type of professional thinking and featuring a specific cognitive style adopted by a given professional circle. Terms ordered vertically, i.e. designating the relations of subordination and partition, indicate the level of a civilizational advancement, whereas concepts arranged horizontally are complimentary to each other and within a specialist lexicon under study serve a synonymous or interchangeable function (Lukszyn 2008a, 258).

The roles of a linguistic intermediary as stated above may be inserted into the diagram presented in Figure 3 upon expanding the content thereof, where the legend should be enriched by the following components:

Extended Legend:

1	►	*Appellative texts → Sequential transposition → Code-switching*
2	►	*Expressive texts → Radial transposition → Paraphrase*
3	►	*Religious texts → Symbiotic (hybrid) transposition → Adaptation*
4	►	*Referential texts (including specialist texts) → telescopic transposition → Compression*
←	►	*The increasing level of cognitive complexity*

As observed above, the most accurate translation technique applicable to the operative texts is code switching, which may be furthered and assisted by artificial intelligence methods. Prior to their transfer to another linguistic code, expressive texts shall firstly be paraphrased, which commits the translator to penetrate the artistic intentions concealed by the author. To a certain extent, a cultural intermediary co-authors and rewrites the source message into the target language. Hence, the higher the verbal craftsmanship of an original, the more subjective and individual the translation (Kielar 2003, 63).

The translation of religious texts usually requires considerable modifications in order to adjust the textual module to the constraints imposed by a particular audience, which entails employing an adaptation technique, construed as a covert translation, in which the output departs from the cultural and linguistic requirements of the source text (Shuttleworth and Cowie 1999, 3).

For the sake of their purpose, scientific texts are rendered into a target language most faithfully while condensing their content, i.e. when presenting a scientific message in the form of a thesaurus which displays the highest level of succinctness, conciseness and terseness. If a given discipline is, nonetheless, developed to a satisfying extent and both source and target languages boast of properly established terminology, one may easily resort to code switching. Whenever, from a scientific angle, a given realm of specialist knowledge has been properly researched and scrutinized, the translation thereof may be subject to indexation and, consequently, to automation. The more advanced a discipline, the higher specialization of LSP.

Through a semiotic magnifying glass

Astounding as it may seem, a human brain is designed in such a manner as to minimize the volume of data processed at every stage of intellectual activity being undertaken. Each human being is equipped with a module for the processing of preverbal signs, i.e. *mentalese*, otherwise known as the language of thought, laying grounds for a natural language (Fodor 1975). The linguistic signs are firmly set and well-specified, yet they occasion to expand in terms of their cognitive capacity. Thoughts, by their very nature, have their pre-conceived structure and follow a pre-determined syntactic order, which allows them to merge into more complex propositions and assertions. Suffice it to say that mental representations are composed of concepts which, while altering their configurations, give rise to new thoughts that are involuntarily subject to sequential transformations. A cognitive flexibility endows one with a great deal of latitude to create more abstract, yet less abstruse, mental constructs (Chlewiński 1999, 99). Thus, it emerges that *mentalese* is a non-sensory, amodal and universal code characterized by conceptual density and saturable compactness.

The articulations as stated above implicitly place a significant emphasis upon inter-semiotic grounds of lexicographic works compiling the net of specialist terms. Given the intertextual nature of a thesaurus, as a lexicographic device mirroring the hierarchy of specialist knowledge, it should employ a wide repertoire of semiotic codes stimulating further cognitive derivation and preponderantly aiming at reorganizing a semantic potential of a given discipline as well as opening the ground for neo-semantization understood in a broad sense. In the quest for the reliable exteriorization of knowledge, the introduction of neosemantic methods for representing mental structures seem a requisite for framing, capturing and/or formalizing, at least on a feasible and attainable scale, an apparently boundless subject of scientific research, ostensibly transgressing the limits of human sensory perception (Lukszyn 2010, 12-13). Knowledge is far beyond verbality, which may be corroborated by numerous scientific discoveries primarily inspired by a mental image seen in one's *mind's eye*. Perception hinges heavily upon coding the world into iconic signs that can represent it within one's mind. Methodology applied for the purposes of substantiating specialist knowledge may be limited to the three rudimentary modes realized by (1) verbal languages, (2) algebra-based codes and (3) geometry-assisted codes. In other words, while constructing a thesaurus of specialist terms, one should bifurcate the available resources of scientific expressiveness into natural (verbal) and artificial (conventionalized and formalized) codes.

What characterizes the craft of compiling professional thesauri may be defined as bipolarity, i.e. splitting the expressive capacity of a lexicographic work into, at least, two semiotic systems interlocking with each other in order to transfer the specialist message to the most accurate degree. LSP polarity ranges from natural language on one side, through a variety of symbols and visual signs, eventually reaching the extreme of artificiality displaying the highest level of codification (Figure 4). The intertwining of verbal language with a highly conventionalized technolect (such as the LSP of chemistry or mathematics) intends to decrease the level of ST redundancy and facilitates reflecting the structure of specialist knowledge to an impeccable extent.
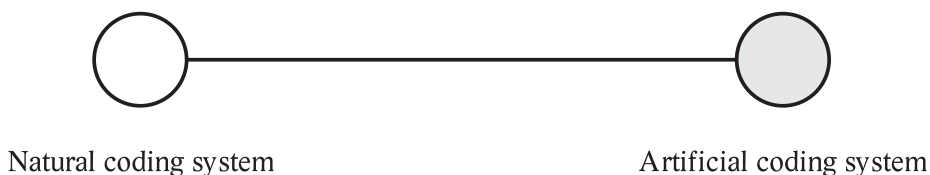

Natural coding system   Artificial coding system

Figure 4. Bipolarity of a thesaurus-like codification

In reference to the foregoing, each lexicographic work is supported by (1) algebra-related codes, purporting to reconstruct a linear sequence of systematized concepts constituting the major pillars in the textual architectonics and (2) geometry-based codes, drawing on ideograms serving as an exponent of a theoretical structure and explaining scientific notions via the juxtaposition of geometric figures. Any superimposing of all of the mental lexicons of individuals will seek to extract the alphabet of human thoughts, i.e. the language shared by everyone, otherwise known as *lingua mentalis*, composed predominantly of universals which fail to be subject to further conceptual divisions; compare the insightful deliberations dedicated to the properties of undefinable semantic primitives (Wierzbicka 1997, 25) and considerations pertaining to the culture-free lexemes along with the universal grammar structures, whose adequate verbalization is feasible in any language (Urbanek 1996, 121-122).

A semiotic approach towards lexicography arises not only from a multitude of extraverbal codes that may be used for the construction of lexicographic works, but also from the function served by each dictionary, i.e. from positioning thesauri on the intellectual map of human cognition as macrosigns substituting for specialist knowledge. Thus, each dictionary acts as a *tertium comparationis*, also known as a *lingua universalis*, i.e. a mental code mediating between SL and TL. Such metalanguage is posited as a semantic common denominator via which the source meaning, construed as an invariant,

is instinctively transferred to the target language. The approval of such an interlingual invariable implies an unwavering belief in limitless translatability and in the unequivocal gravity of equivalence. Following the lead of Chomskyan linguistics, where the notion of *tertium comparationis* is deeply rooted in bilingual generative models of translation, the interlingual transfer is conceived as the process of encoding and decoding an unalterably mental message. Viewed from that perspective, *tertium comparationis* serves as an Archimedean point from which the surface structures of both languages may be generated (Shuttleworth and Cowie 1997, 167). As a rebuttal to that point, it may be convincingly argued that the existence of *tertium comparationis* remains unverifiable and is basically parole-based, which means that it is not simply a matter of converting decontextualized, idealized phrases and sentences from one language to another, but rather a recodification of an elusive, context-determined, implicature-laden source message into target language.

The consolidated conclusions to be drawn from the above analyses are as follows:

- Construed as a substitution for a specific professional reality, a thesaurus serves an array of functions, all of which may be funneled down into three basics (cf. Leski 1978; Zmarzer 1991; Lukszyn and Zmarzer 2006; Lukszyn 2008b): (1) denotation, (2) designation and (3) reference (Figure 5).
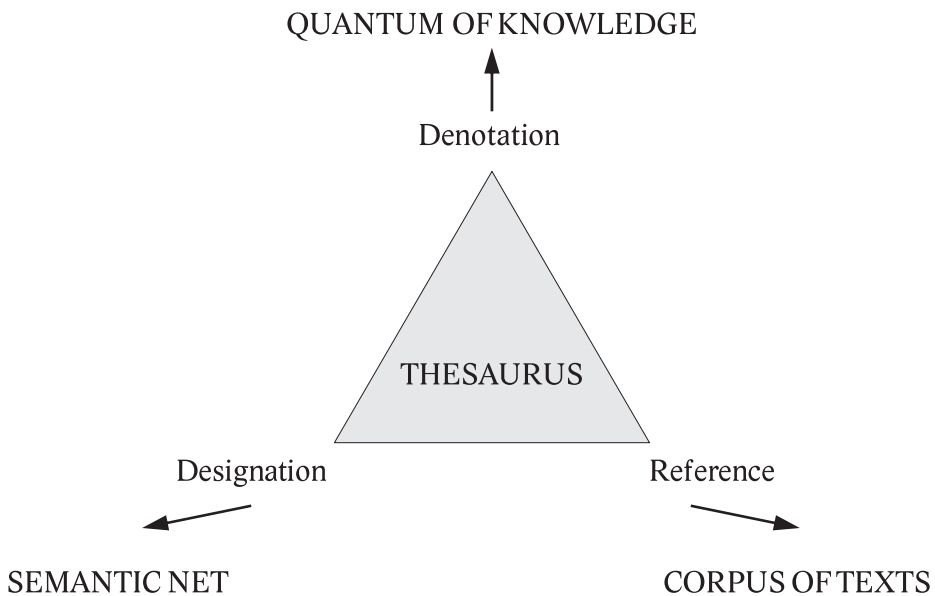

QUANTUM OF KNOWLEDGE

Denotation

THESAURUS

Designation   Reference

SEMANTIC NET   CORPUS OF TEXTS

Figure 5. The functions of a thesaurus

    * Compact as it is, the thesaurus serves its denotative function as a result of replacing a given quantum of specialist knowledge externalized by way of a specific metalanguage. Whenever the higher-ranking metalanguage is used, a selected fraction of knowledge becomes terminologically oversaturated, which renders a thesaurus intelligible exclusively for a hermetic circle of highly qualified professionals.

    * Perceived as a designatory device featured by the multilaterality of its interconceptual relations, it refers to a set of semantic constants which in their very configuration resemble an extragalactic nebula.

    * A referential role of a thesaurus is revealed upon its projection on a representative corpus of texts employed as a foundation for its construction. With the empiricist view in mind, corpus linguists may be deemed as working very much against the grain of the prevailing competence-based and rationalist approach.

- Introspectively perceived, a thesaurus is an internalized knowledge system accompanied by an elaborate cognitive algorithm used for distinguishing and categorizing mental spaces and underlying the production and comprehension of specialist texts.

- A materialization of a thesaurus is (a) presaged by the text *in statu nascendi* being in the course of formation at a prefigured stage and (b) supported by a more abstract extraverbal codification of specialist knowledge which absorbs the highest level of condensation.

- Observed from a semiotic angle, a thesaurus may be defined via the ensuing formula: $mS < L_T // C_S < LSP$, where the macrosign of specialist knowledge (mS) is composed of a terminological lexicon (L_T) introduced into the syntagmatic order in compliance with the rules of cognitive syntax (Cs), and pursues communicative, productive as well as cumulative functions within the remit of languages for specific purposes (LSP).

With the foregoing articulations outlined and solidified, this paper may inaugurate a wealth of further research questions which provide an intriguing background for additional analyses, for instance:

- How does the specification of semantic relations (e.g. generic, partitive, contradictory, etc.), which prevail within a particular domain, facilitate the transfer of specialist knowledge within a professional communication channel?

- How can semantic relations under study contribute to the advancement of an effective algorithm for knowledge absorption?

- To what extent does a selected corpus of texts demonstrate the complexity of an examined quantum of knowledge?

The comprehensive examinations of the phenomena, such as (1) the ontological status of specialist knowledge, (2) the nature of cognitive processes embroiled in the creation of specialist texts, and (3) the conversion of human-like verbal messages into a diversity of semiotic codes may prove particularly revealing and informative. These three aspects would definitely assist in unraveling the intellectual, Gordian knot troubling the minds of specialists and experts within the professional communication channel.

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