

A CORPUS-BASED RESEARCH INTO COGNITIVE-SEMANTIC FEATURES IN ESP COURSE BOOK *SECURITY PERSONNEL*

KORPUSOVO ORIENTOVANÁ SONDA DO KOGNITÍVNO-SÉMANTICKÝCH PRVKOV
V UČEBNICI ODBORNEJ ANGLIČTINY

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Abstract

Assuming preparation of teaching materials for English for Specific Purposes (ESP) courses requires analysis of existing being proven as examples of good practice for both teachers and learners, there arises the need to scrutinize such a lingua-didactic material used at UNIZA (University of Žilina) from a linguistic viewpoint. Therefore, the article examines the course book's *Security Personnel* texts. Specifically, the research addresses the cognitive semantics viewpoint, notably, Fillmore's *frame theory*. Accordingly, the analysis shall outline some features of the course book based on its semantic interpretation of selected examples. A kind of empirically driven research supplements brief corpus analysis.

Keywords: English for Specific Purposes, Corpus, Cognitive Semantics, Cognitive Frames, Security Frame, Idiosyncrasy of technical language.

Abstrakt

Príprava výučbových materiálov pre výučbu odborného cudzieho jazyka vyžaduje analýzu už existujúcich materiálov, ktoré sa osvedčili ako príklady dobrej praxe. Z tohoto dôvodu je nevyhnutné sa z jazykového seľadiska zamerať na lingvo-didaktický material používaný na Žilinskej univerzite. Článok sa preto konkrétnejšie zaoberá učebnicou *Security Personnel* (Pracovníci bezpečnostnej služby). Predmetný výskum vyzdvihuje pohľad kognitívnej sémantiky, menovite Filmoreovej *frame* teórie. Cieľom je analýza textu založená na sémantickej interpretácii vybraných príkladov. Krátka korpusová analýza dopľňa celistvejšie prezentovanú sondu do problematiky.

Kľúčové slová: odborný cudzí jazyk, korpus, kognitívna sémantika, teória konceptuálnych rámcov, konceptuálny rámec BEZPEČNOSTĽ, špecifickosť technického jazyka.

Introduction

Language training features

Language training in English within the field of Security management lasts two semesters in the Faculty of Security Engineering (FSE, or more common FBI being abbreviated from Slovak name) at the University of Žilina. Students acquire the terminological basics from the field given. The basis for acquiring this knowledge is the *Security Personnel* (2017) textbook from the *Career Path* edition. This edition offers a wide range of textbooks ranging from Fundamentals of Electronics to Human Resources, Maritime Affairs, Public Relations, Construction, Railway Transport, and the like. The textbook contains, three sub-textbooks, meant for three term's language preparation, which is, however, limited to 2 semesters according to the new accreditation's requirements. Each book contains 15 chapters, of which teachers opted for the most appropriate thus being, *Traits of security officer*, *Types of security officer*, *Personal appearance*, *Uniform*, *Equipment*, *Patrol*, *Surveillance*, *Describing people*, *Crime*, *Security and Law enforcement*, *Criminal justice 1*, and *Criminal justice 2* in the winter term. Chapters, which are included in the summer semester include the topics *Physical security 1*, *Physical security 2*,

Information security, Armored vehicle security, Personal protection, Transportation security, Weapons 1, Weapons 2, Weapons 3.

Goals and methods in the case study

First, the study aims to assist especially trainers (or teachers) at the FSE to point up some engaging phenomena present in the lexis of the coursebook *Security Personnel*. The insights gained might well identify the polysemy cases between technical and the common English vocabulary, somewhere between the level B1 – B2. As shall be seen from the illustrations below, some words change their meaning significantly depending on the context. Second, although the linguistic approach and assumptions behind might pose some difficulties because of its abstractness, the investigation might help enthusiastic learners of ESP with sufficient foreign language level studying security management as well. Third, to shed light on methodology, writers goes into principles governing cognitive semantics. Our attention was especially drawn by the *frame theory*, which is meant to provide the basis for the establishment of some important facts within the lexis. Later on, the experimental part aims to handle the difference between corpus search and *frame-based* elaboration of its elements.

Theoretical background to frames and frame semantics

According to Evans' Glossary of Cognitive Linguistics (2007) a frame is identified as “*a schematisation of experience (a knowledge structure), which is represented at the conceptual level and held in long-term memory and which relates elements and entities associated with a particular culturally embedded scene, situation or event from human experience. Frames include different sorts of knowledge including attributes, and relations between attributes [...]*” (Evans, 2007, pp. 185 – 86).

The definition's-based assumptions formed theoretical prerequisites for establishing the cognitive lexical semantics or *frame theory* founded by Charles J. Fillmore. The objective of the theory is to describe a „*structured inventory of knowledge associated with words, and to consider what consequences the properties of this knowledge system might have for a model of semantics*“ (Fillmore, 2007, s. 185-86). More precisely, Fillmore clarifies these rather abstract definitions claiming that “*many objects, persons and experiences in the world are framed in terms of their potential role in supporting, harming, or enhancing peoples's lives or interests*” (Fillmore, 1976b, p. 128). Furthermore, using an example of adjective *good* Fillmore asserts that our mind just naturally elaborates “*head nouns [...] with ready-made function-identifying scenarios*” and he by closes stating that “*the process of language understanding is a creative process and that it depends on the language-users' ability to use language to indicate ways of framing experience*” (Fillmore, 1976b, s. 128). To put it simply, “*frame semantics theory asserts that humans understand word meaning by accessing a coherent mental structure of encyclopaedic knowledge*” (Yu-Xu, 2022, p. 2). Fillmore, yet within the *golden age* of generative grammar mentioned principles driving the creation of a lexicon which he summarized in the paper *Types of Lexical Information*. Despite the fact he states 8 principles, only 6 of them are considered significant ones being listed below:

- “(i) the nature of the deep-structure syntactic environments into which the item may be inserted;
- (ii) the properties of the item to which the rules of grammar are sensitive;
- (iii) for an item that can be used as a ‘predicate’, the number of ‘arguments’ that it conceptually requires;
- (iv) the role(s) which each argument plays in the situation which the item, as a predicate, can be used to indicate;
- (v) the presuppositions or ‘happiness conditions’ for the use of the item, the conditions which must be satisfied in order for the item to be used ‘aply’;

(vi) *the nature of the conceptual or morphological relatedness of the item to other items in the lexicon*” (Fillmore, 1969b, p. 109).

From the writer’s point of view, principles 3 – 6 proved to be helpful in making up a frame in particular. Nevertheless, even the text semantics can benefit from the Fillmorean theory: “[it] can be additionally combined for text semantics [by addressing slot and filter templates]” (Savova et al., 2005, s 1.). However, this frame theory application goes beyond the scope of the paper.

To discuss SECURITY-related frames being dealt with in the Faculty of Security Engineering involves associating the notions of frame with the topics in the ESP Course Book *Security Personnel*. One good example poses Book 1 Chapter 11 named *Crime*. In line with this, two types of crime are distinguished: *nonviolent* and *violent*. Accordingly, hyperonym *theft* comprises two co-hyponyms: burglary and robbery and *to steal something* is used as a verbal synonym for the nouns. With reference to the verbs *steal* and *rob*, Fillmore observes the verbs must have three referents¹, that is three noun phrases (or arguments). More precisely, he defines the referents’ roles as the CULPRIT, the LOSER and the LOOT: “*It seems to me, however, that this sort of detail is unnecessary, and that what we need are abstractions from these specific role descriptions, abstractions which will allow us to recognize that certain elementary role notions recur in many situations, [...] Thus we can identify the CULPRIT of rob with the more abstract role of AGENT. [...] in general [...] the roles that [predicates’] arguments play are taken from an inventory of role types fixed by grammatical theory*” (Fillmore, 1969b, p. 76).

Next, let us now discuss briefly constituent elements governing frame set up. First, the word *abstractions* plays a pivotal role in the frame theory since they are an inevitable part of relativizing meanings to scenes (Fillmore, 1977a, p. 73). Second, the decisive element of dealing with semantics is the activation or creation of the cognitive scene. Third, the scenes rely on the speaker’s encyclopaedic knowledge, that is, the way the world around us works. It should be noted that frequent usage of term *scene* refers to early stage of the approach presented. Accordingly, the term *scenario* designates the complex event frames and the term refers in linguistic terms to the paragraph of a text having cohesion and internal structure (Schulze, 2000, pp. 39 – 40).

In this context, it is the verb that primarily accounts for which referents are brought into perspective. The situation illustrates in a variety of ways an example of putting together a frame for REVENGE. For the sake of putting up a frame, a speaker’s cognition (interlocutor) must list basic vocabulary in broad terms coupled with the frame. The examples illustrate the situation below: “*Verbs: avenge, revenge, retaliate, get back, get even, pay back Nouns: revenge, vengeance, reprisal, retaliation Adjectives: vengeful, vindictive*” (Baker, 2014, p. 13). After having listed the basic vocabulary, the interlocutor shall form utterances. As far as corpora (the computerized databases of text) are at hand, this poses no problem. Specifically, one of the relevant utterances found in corpus search is Victoria *retaliated* against her boss for being dismissed by leaving with the keys (Baker, 2014, s. 13). Next important Fillmore’s point comprises constituent elements of a frame like various participants, props, and other conceptual roles, each of which is called a frame element (Fillmore, 1977b, p. 72). Henceforward, the exemplification of the potential frame constituents results, in turn, from the REVENGE frame as follows:

“Injured party: someone who was harmed

Injury: the harm done

Offender: someone who did the harming

Avenger: someone who did something in turn (maybe the same person)

Punishment: something done in turn” (Baker, 2014, p. 16)

¹ Referents are meant to be entities (people/objects in the real world) on the conceptual level.

Finally, the annotation of the initial utterance *Victoria retaliated against her boss for being dismissed by leaving with the keys* indicatse the frame elements having assigned this way:

[Victoria AVENGER] RETALIATED [against her boss OFFENDER] [for being dismissed INJURY] [by leaving with the office keys PUNISHMENT] (Baker, 2014, p. 18).

It should be noted that Fillmore frame elements like subject and direct object within the ditransitive clauses designates as nuclear elements. More precisely, with careful examination of Coursebook *Security Personnel*, the nuclear elements *we-officers*, *officers – behaviour*, *mobile patrol – stationary patrol*, *you – information*, and *you* are to be found in utterances (1 – 5) respectively:

(1) We *expect* officers *to be loyal* to our company.

(2) Officers *must report* suspicious behaviour to the stationary patrol.

(3) The mobile patrol *should contact* the stationary patrol for backup.

(4) You may *discuss* confidential information with your coworkers.

(5) The article *recommends* jobs with a lower risk of crime.

and specifically in Book 1 Chapter 1 named *Traits of a Security Officer*, next Chapter 6 named *Patrol*, and then Book 1 Chapter 11 *Crime* Book 2 Chapter 5 named *Information Security* respectively.

An example of frame creation within the ESP context

With reference to the frame theory outlined above, our proposal is to suggest creating frames for each ESP topic to be taught by elaborating on the whole image events, relations, roles, entities, and their features (Fillmore, 1977b, p. 72). Hence, in linguistic terms, these are verbs, nouns and adjectives. Thus, the frame made up for PHYSICAL SECURITY is to be coupled in the coursebook *Security Personnel* with this lexis:

Nouns: break-in, burglar alarm, (false) alarm, intruder, keyholding, keypad, motion detector, PCU, PIN, sensor, (silent) alarm, siren, (access) control, (access) point, barrier, biometric identification, credentials, entrance, fence, fingerprint scanner, gate, padlock, passcode, property, (retinal) scanner

Verbs: activate, go off, respond to, restrict, trespass

Adjectives: false, silent, access, authorized, retinal

To set out the basic semantic parameters, the paper must consider one of the Cognitive linguistics-driven premises that speaks in favour of only two primary conceptual categories emerging in our cognition: relations and entities. Specifically, the entities are man or object-like entities whilst the relations comprise abstract nuances among these entities. Regarding the linguistic expressions, the former is expressed by means of nouns, the latter by verbs or prepositions for the most part. Besides, putting a frame together requires making up of a scene i.e. the same way like the scene in a movie. In line with these assumptions, the movie-metaphor is very useful to get understanding of frame theory. Therefore, the following analysis addresses primarily nouns and verbs since they comprise “*nuclear elements*” of a frame (Fillmore, 1977b, p. 75).

Second, for the sake of finding the appropriate linguistic formulations expressed in utterances, the usage of the corpus BNC (British national corpus)² was necessary. The BNC involves more than 100 million words which were collected between 1980s and 1993. The corpus

² There are available subcategories like *Spoken*, *Fiction*, *Magazine*, *Newspaper*, *Non-Academic*, *Academic*, and *Miscellaneous* for searching in corpus. The subcategory chosen is always mentioned behind the examples in brackets.

is free available after logging in on the website with a limited amount of searched words per specific period.

Cognitive semantics places a lot of emphasis on the research of real language. For this reason it defines itself as a usage-based model. Therefore, employing the corpus search can help the ESP materials' creators to find collocations and, additionally, topic-specific idioms. Two examples of using the term *break-in* look as follows:

(6) *A break-in at a house in Emley Moor Road resulted in a birthday cake being stolen.* (W_newsp_other_social)

(7) *Blonde Lesley, 29, had been called to a house break-in in the Wavertree area of Liverpool.* (W_newsp_other_report)

After searching in BNC the most frequent collocations of *break-in* were *house, thieves, stolen, police, burglars, attempted, happened, centre, car, investigate*. When choosing an adjective, e.g. *authorized*, the most frequent collocates are *version, act, council, capital, president, statute, UN, institutions, vehicles, persons, parties, security council* or *court*. However, it is obvious, that the 7 most frequent terms (starting with *version* and finishing with *UN*) aren't, on the whole, closely associated with the frame PHYSICAL SECURITY being dealt with in here. Nevertheless, BNC notes that the collocates are from the contexts of social science, political law or commerce. The evidence from the corpus suggests that first collocate appropriate for our purposes could be noun *institutions*. Similarly to the noun *break-in*, the examples below indicate their mutual collocability:

(8) *Particular institutions were to be authorized to carry out the 'main validation procedures' leading to the Council's approval.* (W_non_ac_nat_science)

(9) *Europe Act in 1993 provides for the EC wide abolition of exchange controls and gives authorized financial institutions the right to do business anywhere in Europe* (W_commerce).

Surprisingly, the rest of the collocates that is *vehicles, persons, parties, security council* or *court*, tending not to be as frequent as the first seven, are straightforwardly coupled with frame PHYSICAL SECURITY. Hence, it is advisable to search also for the words not having the highest frequency in BNC, but since we do not discuss everyday language, especially those coming up in the context required. Surprisingly, searching for the collocates of the verb *respond to* indicates even greater complexity. Accordingly, it should be mentioned, that the verb has more than 100 hundred collocates according to the BNC. The verb which is in the ESP course book *Security Personnel* collocated with *all alarms*, doesn't occur in first 30 collocates: *how, needs, able, failed, changes, treatment, changing, demand, ability, requests, demands, questions, cells, fail, slow, challenge, failure, capacity, unable, stimulus, concerns, listen, signals, failing, pressures, situations, enable, calls, individuals, stimuli*.

Even though, more general terms like *stimulus* or *signals* are listed in 20. and 23. place out of 100 the most frequent listed collocates. These collocates might be possibly equivalent to more specific *all alarms*. The examples of sentences with the two terms collocate as follows:

(10) *A conventional computer is turned into a 'thinking machine' by programming it to behave as if it consisted of a collection of brain cells -- neurons -- which will respond to a stimulus* (W_newsp_brdshst_nat_science).

(11) *A brain structure responsible for such a response is an innate releasing mechanism. Just as an animal without previous experience may respond to a complex stimulus, so it may produce a complex set of movements in response to a stimulus.*

(W_non_ac_nat_science)

(12) *Britain's manufacturing base is declining not just because the Conservative party seems to care so little about it but because of so many companies' wilful refusal respond to changing market signals.* (W_newsp_brdshst_nat_misc)

(13) Olfactory and taste organs closely resemble conventional hormonal systems in that they *respond to* chemical *signals* by membrane-bound receptors coupled to various second messengers. (W_non_ac_nat_science)

So far, the paper set out noun collocability with selected verbs in greater detail. Owing to the fact that verbs, in general, act as a meronym expression³, that is, a verb involves a whole image event. Analogically to Baker's example, let's set up the frame for the verb *respond to* listing the frame elements. The frame involves

Sender: someone or something who sends a signal or stimulus

Receiver: someone or something that receives a signal or stimulus

Data received: the bunch of information being transmitted

Medium: the air (or other technical means) which transmits sound (or electrical signals)

The Frame elaborated is author's own suggestion. Ultimately, our aim was to demonstrate the usage of the corpus with the identification of frame elements pointing out the usefulness of the approach.

The logic behind motivating context

As shown above, the frame semantics is to a great extent of empirical nature (Fillmore, 1982, p. 11). So far, rather than individual terms related to the FRAME security, the whole utterances have been considered. More specifically, the corpus of the relevant chapters selected in Coursebook *Security Personnel* contains 1448 word types and 6390 word tokens on the whole. Besides, only *even* pages of chapters named in the introductory part *language training features* were used for examination, since they contain new field-related terminology and texts. On the contrary, the *odd* pages solely contained the exercises for fixation of the vocabulary, e.g. listening or practicing dialogues. To conduct an exploration of the terms found in the Coursebook *Security Personnel*, some important Fillmore's insights need to be pointed out. First, our attention attracts the notions of *motivating context*, *specific cognitive frames* or *framing words*. Beforehand, dealing with motivating context requires taking a following notion into account: "*words and other linguistic forms and categories are seen as indexing semantic or cognitive categories which are themselves recognized as participating in larger conceptual structures of the same sort (earlier scenarios, now frame networks or network of frames, JB) all of this is made intelligible by knowing something about the kinds of settings or contexts in which a community found a need to make such categories available to its participants, the background of experiences and practices within which such contexts could arise, the categories, the contexts, and the backgrounds [...]*" (Fillmore, 1982, p. 119).

Thus, specialized words emerged having access to specialized frames differing from everyday frames. Inevitably, this process goes hand in hand with categorization being followed by self-evident framing. This might be the case when the motivating context is idiosyncratic. In such a case, nevertheless, the knowledge of background context isn't sufficient precondition for knowing a word's meaning. The examples of such words (terms) emerging in our research text are *walkie-talkie* (Book 1 Chapter 5 named *Equipment*), *justifiable homicide* (Book 2 Chapter 14 named *Weapons 2*) or *inside job* (Book 2 Chapter 6 named *Armored vehicle security*) and lastly, *black swan*. The single course book text's exemplifications a) comes along with its definitions b):

³ Describing the verb as a meronym is currently associated with methodology of cognitive linguistics. Though, Slovak linguists put forward so called *teória intencie slovesného deja* which origin is dated back to Ludovít Štúr (*idea namerenosti slovesa*). In the recent past is *teória intencie slovesného deja* associated with names like E. Pauliny, J. Ružička and J. Kačala (Turočková, 2012, p. 57). In short, the theory describes the ability of the verb to express linguistically Subject and Object (traditionally termed) (Bruk, 2015, p. 106).

Walkie-talkie

(14a) A *walkie-talkie* helps people hear each other from some distance away.

(14b) A *walkie-talkie* is a portable, handled radio that is used to communicate with another person who also has a walkie-talkie.

Justifiable homicide

(15a) According to state statutes, you committed a *justifiable homicide*.

(15b) *Justifiable homicide* is the act of taking someone's life for reasons acceptable to the law, such as to protect oneself or someone else from death.

Inside job

(16a) Bullet-resistant glass is ineffective against an *inside job*.

(16b) An *inside job* is a crime committed against a particular company by people working inside that company.

The last example i.e. *black swan* is a prime example of idiosyncrasy even though its context relates to the SAFETY, specifically to the topic of *resilience of the critical infrastructure: Black swan*

A black swan is a metaphor for an unpredictable, high impact, and rare (UHR) event. This type of event is also referred to as the "*unknowable*," i.e., a rare cataclysmic event with unforeseen or unobserved consequences upon random occurrence. The proliferation of the smartphones and the impact of Google search technology are examples of positive black swans. In contrast, the devastating consequences of the September 11 attacks (9/11) and the 2004 Indian Ocean tsunami are negative black swans. Obliterating impacts of a severe earthquake is another instance of black swans. To summarize, the key elements of black swans are rarity, extreme impact, and retrospective predictability (people make concoct explanations after the event). (Gholami – Shekari, 2018, p. 2)

Besides, despite knowing the general context of SECURITY (and SAFETY) frame, an ordinary learner of English doesn't grasp fine-grained notions exemplified by a) associated with them. To put it simply, "[...] *the word's meaning cannot be truly understood by someone who is unaware of those human concerns and problems which provide the reason for the category's existence*" (Fillmore, 1982, p. 120). Accordingly, the category of *black swan* events subsumes scenario of unknowable events like those stated above in general. Second, convincingly coupled with the category or specific cognitive frames like *black swan*, engaging such frames could categorize the psychological reality of the outer world more easily.

Next, the writer intends to discuss the salient insights into the existence of specific cognitive frames below. More precisely, the a) are prime examples explaining the frame-based approach to idiosyncratic cognitive frames whose understanding "*involves retrieving or perceiving the frames evoked by the [...] lexical content and assembling this kind of schematic knowledge into some sort of envisionment*" (Fillmore, 1982, p. 120) of a scene being attributed to so called *lexically signalled framing*. Thus, all the 17a – 21a examples illustrate *framing* words (*italicised*) referring to the SECURITY frame in general whilst, conversely, b) instances below account for affinity to everyday speech frames. The 17b – 21b examples come either from Cambridge online dictionary or Cambridge English Corpus.

(17a) You will have only a short time to conduct *visual sweeps* of venues. (Book 2 Chapter 7 named Personal protection)

(17b) I've given the kitchen floor a *sweep* (= I have swept it).

(18a) Keyholding is a service in which a security company has access to a client's *premises*. (Book 2 Chapter 2 named Physical security 1)

(18b) Starting from very different philosophical *premises*, they ended up arguing for very similar political goals.

(19a) A *magazine* is a detachable container that holds several rounds for a firearm. (Book 2 Chapter 13 named Weapons 1)

- (19b) She has written articles for several women's *magazines*.
(20a) Some firearms are not allowed at shooting *ranges*. (Book 2 Chapter 13 named Weapons 1)
(20b) The price *range* is from \$100 to \$500.
(21a) Only *discharge* your weapon when it is safe to do so. (Book 2 Chapter 13 named Weapons 1)
(21b) Patients were *discharged* from the hospital because the beds were needed by other people.

Conclusion and further prospects

At most respects, the insight into frame semantics has basically identified two kinds of frames: general and idiosyncratic related to the Security (and Safety). Owing to the fact the background context might be very idiosyncratic, the same words frequently belong to various frames, or furthermore, they might represent category on its own (*black swan*). In traditional terms, these phenomena are linguistically subsumed as polysemy. As a result of the frames having been introduced, a brief overview of the both frame theory and its potential application was set out. Subjecting the frame theory to the empirical analysis, as well as simultaneously drawing on the exemplifications, lead the writer to suggestion for potential usage whenever there arises need for getting an overview of potentially unknown subject of interest, which, undoubtedly, technical frames pose for foreign language teacher. Additionally, in case the ESP teachers are supposed to prepare state-of-the-art materials, the cognitive network of frames might be a useful assistant in grasping e.g. technical topics with ease. Nevertheless, the rationale for reviewing the *FrameNet* database relies on usage of exhaustive material to the mind mapping, brainstorming or brainwriting activities. Besides, technical advancement achieved by the *FrameNet* project provides a useful basis for machine language processing. Ultimately, the investigation of the ESP text could be easily extended using the Metaphor and Metonymy theory. Therefore, the article might serve as an introductory part to such a study and, in turn, it might contribute to the complex insights into principles governing technical language and its terminology.

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