

FRAME ACTIVATION WITHOUT CONTEXT: A COGNITIVE APPROACH TO AVIATION ENGLISH TERMS

Valya TSVETANOVA

”Georgi Benkovski” Air Force Academy, Dolna Mitropolia, Bulgaria (valtsvetanova@gmail.com)

DOI: 10.19062/2247-3173.2026.27.12

Abstract: *The paper focuses on what types of frames first-year cadets at ‘Georgi Benkovski’ Air Force Academy in Bulgaria evoke when they are given lexical units without a context. The paper presents a study on whether cadets evoke specialised aviation-related frames or tend to activate general English ones. The discussion includes four lexical units that are polysemous (evoke multiple frames) and are also terms used in aviation English. The results confirm that frame activation depends on cadets’ general knowledge and experience*

Keywords: *cognitive linguistics, frame semantics, frame-based terminology, aviation English*

1. INTRODUCTION

The idea of Frame semantics was introduced by Charles Fillmore, who notes that it originates from empirical semantics and is a perspective on how to understand word meanings. Frame semantics is an approach that helps us describe how new words and phrases are created, how words acquire new meanings, and how the frame elements in a text contribute to its overall meaning. According to Fillmore [1], a frame is “any system of concepts related in such a way that to understand any one of them you have to understand the whole structure in which it fits; when one of the things in such a structure is introduced into a text, or into a conversation, all of others are automatically made available.” Charles Fillmore (ibid.) refers to a frame as a representation of “a small abstract scene or situation” and to understand the meaning of a given word, one has to understand the characteristics of the scene it belongs to.

That way Frame semantics supports one of the tenets of Cognitive linguistics that language cannot be separated from experience and human cognition. Therefore, a frame is the structured way a scene or situation is organised in a person’s mind and when a person uses a word, it evokes the whole frame, which leads to the assumption that the frame shapes the word meanings and the word activates the mental structure, i.e. the frame, that helps us understand its meaning in context. In other words, when we hear or see a word, it activates the frame it belongs to. It also means that if a person does not have sufficient knowledge, they will not be able to evoke the frame and understand the scene. Frame Semantics has been researched throughout the years and names of some prominent researchers can be listed: Fillmore [2,3,4], Baker [5,6], Boas [7,8], Petruck [9,10], Nedelcheva and Todorova [11].

Frame semantics is one of the pillars of Cognitive linguistics and can also be referred to as the foundational framework of other linguistic approaches. Boas [8] notes that “the intellectual roots” of CxG (Construction grammar) and Frame semantics were planted in 1968 when Charles Fillmore published his seminal work *The Case for Case*.

The FrameNet project (<https://framenet.icsi.berkeley.edu/>) is the web-based practical application of Frame semantics and its aim is to describe the meanings of words through the conceptual frames they evoke. Thus, each semantic frame is represented together with its frame elements and valence descriptions.

Another linguistic approach influenced by Frame semantics is the Frame-Based Terminology approach (FBT). The FBT approach was developed by Pamela Faber, and it uses the principles of Frame Semantics and Cognitive linguistics but applied to specialised knowledge, i.e. terminology. Faber and Garcia [12] note that the FBT is based on the idea of frames, which are described as “an organized package of knowledge that humans retrieve from long-term memory to make sense of the world” [13]. Terms are not just definitions, and they do not exist in isolation. Meaning is organized in frames, and a term activates a specialized frame, which contains all the necessary knowledge. Even within the frames themselves, terms are linked to conceptual relations, thus the frame provides linguistic and cognitive context for understanding the terminology. As Faber and Arauz [14] note, “Specialized knowledge bases are based on explicit and implicit conceptual representations. Specialized knowledge understanding is enhanced when concepts and terms are organized so that the relations between them become explicit.”. They also add that FBT focuses on conceptual organization, the multidimensional nature of terminological units and the extraction of semantic and syntactic information from multilingual corpora. Frames in FBT are defined as “a schematisation of experience (a knowledge structure)” [14].

Based on the discussion above, it is evident that frames are fundamental to how we think and understand. Each linguistic unit evokes a frame with its frame elements, revealing conceptual relations within the frame itself. Therefore, it would be of great interest to research whether first-year cadets, studying at Georgi Benkovski Air Force Academy, activate specialised aviation-related frames or general English frames when they are given a list of words, used in isolation, i.e. out of context. Every lexical item evokes a frame – even if it is not used in context. When a word can be used as a term in a tightly specialised context, then which frame will be activated? Do first-year cadets have sufficient knowledge and experience to activate specialised aviation-related frames? Will they be influenced by the surrounding environment and as a result of that they will activate some of the specialised frames? What words or terms will they use to activate a frame? The following research will try to find the answers to these questions.

2. RESEACRH

The findings, discussed here, are part of research, whose results will be presented and interpreted in a PhD dissertation. Therefore, the following discussion is considered preliminary and reveals a small but important part of valuable research on Cognitive linguistics as a whole. The study was conducted in October, 2025 at Georgi Benkovski Air Force Academy in Dolna Mitropolia, Bulgaria. 24 cadets (1 female and 23 male students) participated in the survey. They are first-year cadets, Pilot specialization. The participants have not had any specialised courses or flying practice yet. The survey contained 5 tasks related to frame activation, identification of frame elements and collocations, and recognition of embodied image schemas. The results of the survey will be officially published as part of the PhD dissertation. This paper aims to present a general overview of the first task or, in other words, frame activation when a term is not used in context, focusing mainly on the word choice and whether these words or terms activate aviation-related frames or general frames.

Although frame activation has been researched by Ostroški Anić and Brač [15], Faber et al. [12,13,14], the following research presents valuable data that bridges the theoretical and practical results. The following findings can contribute to terminology teaching, curriculum design and materials development in military aviation education. This study also reveals how first-year cadets cognitively process the given list of words, testing whether they will activate specialized aviation-related frames or, due to insufficient practice and knowledge general, English frames will be evoked.

To find what types of frames first-year cadets evoke, we compiled a corpus using corpus linguistics software Sketch Engine (<https://www.sketchengine.eu/>). The corpus consists of books and manuals related to aviation:

- Flight Theory and Aerodynamics. A Practical Guide for Operational Safety [15];
- Fundamentals of Aerodynamics [16];
- ICAO, Doc 4444, Air Traffic Management [17];
- Encyclopedia of Aerodynamics [18];
- Pilot's Handbook of Aeronautical Knowledge (chapters 5-16) [19].

That way, the cadets, who took part in the survey, were tested through authentic texts, which guarantee the validity of the results.

The first-year cadets were given a list of ten words – they were not told that these words could be used in an aviation context. The instruction was general and did not hint that the cadets would be tested on aviation English. It is important to note that none of the participants are familiar with notions such as frames, frame activation and frame elements. Most of the words, included in the list, are used in general English but they are also aviation terms which have specialised meaning. The participants had to read the given words and for each one to write three other words that came to their mind. The list includes the following words: *lift*, *aerodrome*, *pitch*, *clearance*, *altimeter*, *nose*, *speed*, *take-off*, *stall* and *taxi*. When used in an aviation context, these terms evoke specialised frames such as *Flight Instruments*, *Air Navigation and Traffic Management*, *Aerodynamics*, or *Ground Movement*. In our opinion, these terms are good candidates for testing frame activation since some of them are polysemous, i.e. they activate different frames. Terms such as *altimeter*, or *aerodrome* do not evoke multiple frames, but they are used to test whether cadets will be able to activate the correct frames using their encyclopedic knowledge and life experiences. Even though they are not polysemous, i.e. they do not evoke multiple frames, we consider these terms familiar to both professionals and laypeople. Since these are considered familiar, then it would be interesting to test whether the first-year cadets have enough knowledge and experience to evoke the frames.

Yet, if these words/terms are given isolated, with no context, which frames will be evoked? Cadets were given a general instruction and they were asked to avoid overthinking. By doing that, our findings can reveal whether their cognition will be influenced by the surrounding environment and they will be able to activate some of the aviation-related frames? Or, perhaps, despite living and studying on a military base, they still will not be able to evoke specialised frames because they do not have sufficient knowledge and/or professional experience.

We propose that the first-year cadets will mostly activate general English frames but we also expect that some aviation-related frames will be evoked due to their interest in aviation. However, we expect that the terms that they will think of are commonly used and well-known to people who are not professionals but are keen on flying and interested in aircraft development. We do not expect that the cadets will use terms that require in-depth knowledge of certain fields within the aviation domain.

This study presents some of the terms included in the task due to the nature of the text and aims to show some interesting insights into cadets' cognition.

Thus, the terms *lift*, *pitch*, *nose*, and *taxi* are discussed below. We chose to present these terms because they activate multiple frames, i.e. they are polysemous – they evoke both general English frames and specialised aviation-related ones.

Although the number of participants is relatively small (only 24 cadets), we accept that the results are foundational and they can give valuable insight into how these cadets cognitively process the given information and whether they activate specialised frames. We believe that the findings can serve as a basis for further research in the field of frame activation.

3. FINDINGS

When analysing the survey results, several things have to be taken into consideration. First, the admission of cadets to Georgi Benkovski Air Force Academy is not large. Therefore, there are 24 cadets in the first year, studying in the Pilot specialisation. That is why, the survey results are reliable and can be accepted as scientific evidence supporting the stated hypothesis that first-year cadets will mainly activate general English frames although we expect that some specialised frames will be successfully evoked. Second, the instruction was general and not leading to assumptions, thus allowing participants to process the given word list independently and without bias. In addition, the surrounding environment influenced the cadets' cognition and some of them tried to activate specialised terms but it was not successful since they lacked the needed knowledge and experience. By 'surrounding environment' we refer to the fact that first-year cadets were not allowed to leave the base for 40 days, nowadays, they live and study in the military base, they see and hear flying planes and helicopters. Some of the cadets, who study at the Bulgarian Air Force Academy, have family members who work or worked in aviation (including military aviation) and that has influenced their career path. It means that their way of thinking has been influenced to some extent; therefore, we expect that these cadets will activate specialised frames even though they lack some prior official specialised education.

The first lexical unit in the list is 'lift' and in a specialised context it has the following meaning: *"One of the four main forces acting on an aircraft"*[20]. If a participant is familiar with the term, they have to activate the appropriate frame, Aerodynamic forces, and identify other terms within the frame. It is also expected that the participants can evoke a superordinate frame such as Aerodynamics.

After analysing the lexical units listed by some first-year cadets, it can be said that they activated aviation-related frames. The Aerodynamic Forces frame was not activated by the terms "thrust" and "drag" but cadets used "weight" instead. The force "weight" opposes "lift" and this choice can be explained by this opposition, meaning these cadets are familiar with the terms within the frame and their relation. Another proposition could be that "weight" was used because it is a more familiar term than thrust and drag, which require more specific knowledge. "Weight" is commonly used not only when discussing aircraft but also various physical phenomena. One cadet evoked the frame using the term "force", which means they were aware of the aviation meaning of "lift" even without a given context. Another participant used "power", probably using it instead of "force". However, the difference in meaning is well-known, therefore, we do not consider "power" as a word that evokes the frame in question. Specialised aviation frames were also activated by words such as *plane*, *helicopter*, *take-off*, *flying*, *up*. It is evident that the cadets' answers are basic words rather than some specialised, specific terms, known only to professionals. However, these can be referred to as terms since they are used in the aviation domain and it can be said that they indirectly activate the Aerodynamic Forces frame as these are actually related to forces. It means these terms cannot be considered core but are in the periphery and there is an overlap between frames.

There are cadets who activated the Building frame. Thus, words such as *elevator*, *mall*, *building*, *stairs*, *apartment*, and *escalator* are among the cadets' answers. These answers were expected as the noun "lift" has the meaning of "a device like a box that moves up and down, carrying people or goods from one floor of a building to another or taking people up and down underground in a mine" [21]. The participants undoubtedly processed cognitively the seen word as an entity (grammatically – a noun) and evoked frames related to their everyday experiences.

Some cadets evoked the Sports frame, more precisely the Fitness frame, using words such as *weights*, *workout*, *gym*, *heavy*, *strength*, *boost*, and *power*. These activate a general English frame, which demonstrates that the participants do not have sufficient knowledge to evoke a specialised frame. The word choices confirm that these first-year cadets processed the given word as a motion caused by a force, i.e. a verb, meaning "to move something from a lower to a higher position" [21].

A cadet activated the Construction frame, using the word *crane* and another one used the verb *raise*, which is a synonym for *lift*. Both participants thought of processes that require motion caused by external forces. A cadet wrote *wind*, and we can only propose that *lift* was recognized as a motion caused by wind power.

Two cadets' answers are particularly interesting. One of them wrote *home*, which was not expected at all. After some consideration, this word choice might be explained by the phrase *give someone a lift*, meaning "to take someone somewhere for free, usually in your car". A possible explanation is that the participant thought of transportation, evoking the Transportation frame. The Oxford online dictionary provided a similar example, which supports our proposition: namely, "*She was kind enough to give me a lift home*" [22].

Other words, used by a cadet, that activate a general English frame and can be related to a phrase are *love* and *dreams*. Generally, lexemes such as *love* and *dream* can be related to positive emotions. Of course, it is rather subjective but, still, can be used as an attempt to justify and explain the cadet's answer. If these two are closely tied to happiness, then, we can propose that they are related to the phrase *lift someone's spirits*, which means that a person is happier. Our explanation is subjective and it is supported by our personal experience and knowledge, thus this cannot be accepted as a definitive interpretation. However, it is certain that the cadet in question did not activate a specialized frame, which is the purpose of the given task.

From the above, it is evident that *lift* activated multiple frames, which confirms that it is polysemous. Also, our proposition that some cadets will be able to activate specialized aviation-related frames is valid. The findings show that cadets activate different general English frames due to their experience and encyclopedic knowledge.

The second term, that we are going to present in this study, is *pitch*. In an aviation context "pitch" means "A nose up/down movement of the aircraft about its lateral axis"[23]. It activates the Aircraft Attitude frame and is closely related to terms such as "roll" and "yaw". The term can be defined as polysemous as it evokes another frame– that of Propeller Mechanics, because "pitch" also means "the distance a propeller would advance in one rotation if there was no slip"[23]. In general English, "pitch" is also polysemous because it can activate several different frames.

Some first-year cadets were able to activate aviation-related frames, using basic terms such as *up*, *down*, *angle*, *nose* and *stall*. None of the participants listed the terms "yaw" and "roll", which means partial frame activation and there is insufficient knowledge. Also, the terms that are used can be classified as basic, which confirms that the participants do not know much about these three dimensions.

Most cadets activated the Sports frame, listing lexical units such as *football*, *baseball*, *throw*, *grass*, *stadium*, *ball*, and *run*. The following lexemes indicate that the participants thought of “an area painted with lines for playing particular sports, especially football” [21] and “a throw in a baseball game” [21]. It is evident that even though the Sports frame was activated, the cadets predominantly used some lexical units that can be identified in the periphery of the frame rather than core frame elements. This leads to the proposition that these cadets used their encyclopedic knowledge based on experience.

A cadet evoked the House frame, using the lexemes *backyard*, *porch*, and *house*. Our proposition is that the frame was activated because the participant was aware of the phrase *the pitch of the roof*, which might have activated other frame elements.

That “pitch” is highly polysemous in general English context is obvious from the fact that two first-year cadets listed the lexical unit *black*. According to Oxford Learner’s Dictionaries [22], “pitch” has the following meaning: “Black substance: a black sticky substance made from oil or coal, used on roofs or the wooden boards of a ship to stop water from coming through”. This sense of “pitch” activates the Material frame and the lexeme *black* can be referred to as a prototypical feature, i.e. *black* in this case is a salient frame element, which signals the Has_Property conceptual relation.

It is evident that “pitch” is highly polysemous, which leads to multiple frame activation. When seeing the lexical unit “pitch”, the first-year cadets, who participated in the survey, mostly activated general English frames and a few of them were able to evoke specialised aviation-related frames.

The third lexical unit “nose” is used in aviation with the following meaning “the extreme forward end of the aircraft” [23] and a few cadets evoked the aviation-related frame Aircraft Construction by giving the following answers: *gear*, *plane*, *radar*, *aircraft*, *cockpit*, *up*, *down*, and *front of the plane*. These answers confirm that there are first-year cadets who recognize the term “nose” as an aircraft component, not as a body part. Again, the terms are basic rather than specifically technical. However, the mention of “radar” five times means that some first-year cadets have some basic knowledge of aircraft construction.

Most first-year cadets activated general English frames. Lexemes such as *face*, *breathe*, *bleed*, *big*, *ear*, *eye*, *human*, *smell*, and *sniff* evoke the Human Body frame. Interestingly, a cadet wrote *red*, thus evoking the Colour frame, probably a cultural reference to either one of Santa’s reindeer Rudolph the Red-Nosed Reindeer or to a clown’s nose.

Two cadets evoked the Vessel Structure frame, listing lexical units such as *boat* and *ship*, which signals that they understand “nose” as a construction element belonging to vessels. It would be interesting to find out whether these two cadets grew up close to the Black Sea or what might have influenced them to evoke this specific frame.

The lexical unit *peninsula* was listed once in the survey. According to Cambridge online dictionary [21], *peninsula* is “a long piece of land that **sticks out** from a larger area of land into the sea or into a lake” and perhaps this choice can be explained by a metaphorical mapping as *nose* also “**sticks out** above the mouth”. In this case, we propose that the idea of protrusion activated the Geography frame.

It was no surprise that most cadets evoked the Human Body frame since the lexical units within the frame are learnt in early childhood and they are deeply rooted in people’s cognitive abilities. The fact that some cadets activated a specialised frame supports our propositions that there are cadets who have had sufficient knowledge and experience to activate, even partially, aviation-related frames.

The last lexical item, which will be presented here, is “taxi”. In aviation English, the term *taxi* is used as a verb and it means “to move an aircraft along the ground under its own power before take-off or after landing”[23]. The majority of the first-year cadets activated the Vehicle frame. Lexemes such as *driver, car, yellow, black and white, catch, money, people, transport, payment, dirty, call, Uber* activate general English frames and each of these reveals how these cadets cognitively processed the lexeme. Thus, the Colour frame is evoked by *yellow* and *black and white* – colours, usually associated with taxis. *Driver, car, catch, payment, money* and *call* directly activate the Taxi frame, describing a well-known scenario. The adjective, *dirty*, is an interesting example of how experience shapes cognition. We can suggest that this particular cadet does not relate a taxi with cleanliness. *Uber* also signals cultural awareness as it is a company that functions in some countries and provides taxi-like services.

Yet, there are some cadets who evoked the Ground Movement frame. These cadets were fully aware of the fact that the aviation term “taxi” is a verb and has specialised meaning; therefore, they listed the following answers: *taxiway, ground control, wheels on the ground, take-off, landing, position, clearance* and *low ground speed*. Five cadets listed the term *runway*, but it is not related to the Ground Movement frame – it evokes Airport Infrastructure, instead.

The lexical unit “taxi” is an outstanding example of how people fail to evoke appropriate frames when there is lack of knowledge and experience.

CONCLUSIONS

The study revealed that first-year cadets, who are studying at Georgi Benkovski Air Force Academy, tend to activate general English frames when they see lexical units, given with no context. General English frames predominate because these cadets had not been taught any specialised subjects by the time they did the survey. They do not have enough specialised knowledge and/or practical experience that can motivate them to cognitively process the given lexemes and to refer to them as terms used in the aviation domain. They evoke frames closely tied to their everyday experience and using their encyclopedic knowledge. The study confirms the proposition that specialised frames, in this case aviation-related ones, are evoked only if the person has enough knowledge to activate scenarios related to a professional context.

A few first-year cadets were able to evoke specialised, aviation-related frames, which means they have sufficient knowledge to recognise that the given lexical units can be used as terms and these activate the appropriate frames. The terms that were listed can be referred to as basic, some of them can be classified as peripheral, which shows that these first-year cadets need to enhance their domain-based knowledge.

The research demonstrated that frame activation depends on knowledge and experience, not only on lexical knowledge. Thus, most first-year cadets were not able to recognise polysemous lexical units that are also used as terms in the terminological field of aviation. It means that general English frames dominate over aviation-related frames at the very beginning of cadets’ professional education. The findings also confirm that terminological meaning depends on the frame and to access the appropriate frame, domain-specific knowledge is required.

This study contributes to the development of aviation English language teaching, as well as to the development of Frame Semantics and Frame-Based Terminology.

REFERENCES

- [1] C. J. Fillmore, *Frame Semantics*, The Linguistic Society of Korea (ed.), Linguistics in the Morning Calm, Seoul. Hanshin Publishing Company, 1982;
- [2] C. J. Fillmore, *Frame semantics and the nature of language*, In S. R. Harnad, H. D. Steklis, & J. Lancaster (Eds.), *Origins and evolution of language and speech*, vol. 280, pp. 20–32. New York, NY: New York Academy of Sciences, 1976;
- [3] C. J. Fillmore, *Frames and the semantics of understanding*, *Quaderni di semantika*, vol. VI, no. 2, 1985;
- [4] C. J. Fillmore, *Frame semantics*, In D. Geeraerts (Ed.), *Cognitive Linguistics: Basic Readings*, pp. 373–400. Mouton de Gruyter, 2006;
- [5] C.F. Baker, C. J. Fillmore & J.B. Lowe, *The Berkeley FrameNet Project*. Proceedings of the 36th Annual Meeting of the Association for Computational Linguistics and 17th International Conference on Computational Linguistics (COLING-ACL '98), pp. 86–90. <https://doi.org/10.3115/980845.980860>, 1998;
- [6] C. F. Baker, *FrameNet: A knowledge base for natural language processing*, In M. R. L. Petruck & G. de Melo (Eds.), *Proceedings of Frame Semantics in NLP: A Workshop in Honor of Chuck Fillmore (1929–2014)*, pp. 1–5. Baltimore, MD: Association for Computational Linguistics. <https://doi.org/10.3115/v1/W14-3001>, 2014;
- [7] H.C. Boas, *Frame semantics and translation*. In *Translation Studies and Cognitive Linguistics*. Routledge, 2013;
- [8] H.C. Boas, *Construction grammar and frame semantics*, In *The Routledge Handbook of Construction Grammar*. Routledge, 2021;
- [9] M. R. L. Petruck, *Advances in frame semantics*, *Constructions and Frames*, vol. 3, no. 1, pp. 1–9, 2011;
- [10] M. R. L. Petruck, *Frame semantics*, In J.-O. Östman & J. Verschueren (Eds.), *Handbook of pragmatics manual*, vol. 2. John Benjamins Publishing Company, <https://doi.org/10.1075/hop.m2.fra1>, 2022;
- [11] S. Nedelcheva & M. Todorova, *Frame semantics and verbs of motion: The case of “enter” and “go into” – A corpus-based study*, In *Studies in Linguistics, Culture, and Foreign Language Teaching*, vol. 3, pp. 46–56, <https://www.ceeol.com/search/article-detail?id=720171>, 2018;
- [12] P. Faber & M. Cabezas-García, *Frames as a framework for terminology*. Frame-Based Terminology (FBT) approach, 2015;
- [13] P. Faber, (ed.). *A Cognitive Linguistics View of Terminology and Specialized Language*, Berlin, Boston: De Gruyter Mouton, 2012;
- [14] P. Faber & P. León-Araúz, *Specialized knowledge representation: From terms to frames*. *Terminology*, vol. 25, no. 2, pp. 198–220, <https://doi.org/10.1075/term.00011.fab>, 2019;
- [15] Dole, C. E., & Lewis, J. E. *Flight Theory and Aerodynamics: A Practical Guide for Operational Safety* (2nd ed.). Wiley-Interscience, 2000.
- [16] J.D. Jr. Anderson, *Fundamentals of Aerodynamics* (6th ed.), McGraw Hill Education, 2016;
- [17] International Civil Aviation Organization. *Procedures for Air Navigation Services—Air Traffic Management (ICAO Doc 4444, 16th ed.)*. ICAO, 2016;
- [18] F.E. Hitchens, *The Encyclopedia of Aerodynamics* [Digital version]. Andrews UK Limited, <https://www.andrewsuk.com>, 2015;
- [19] Federal Aviation Administration. *Pilot’s Handbook of Aeronautical Knowledge (FAA-H-8083-25C)*. U.S. Department of Transportation, FAA, 2022;
- [20] Jeppesen Maintenance. *The Aviation Dictionary: For Pilots and Aviation Maintenance Technicians*. Jeppesen Maintenance, 2012;
- [21] <https://dictionary.cambridge.org/>;
- [22] <https://www.oxfordlearnersdictionaries.com/>;
- [23] D. Crocker, *Dictionary of Aviation* (2nd ed.). A & C Black, 2007.