

Review research paper

FORMULAIC LANGUAGE IN AERONAUTICAL ENGLISH – FRIEND OR FOE

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Abstract. *The paper discusses formulaic language, its classification, function, and its role in Aeronautical English. On the one hand, using idiomatic expressions in aviation communication may lead to ambiguity, confusion and communication breakdown. On the other hand, teaching formulaic expressions to student pilots and air-traffic controllers can have positive effect on their fluency and help them develop their interactive communicative skills. Despite the fact that research on formulaic language acquisition has been modest, the paper suggests that it should be incorporated in an aeronautical English syllabus.*

Key words: *formulaic language, aeronautical English, aviation English, ESP, fluency*

1. INTRODUCTION

Words are powerful tools which can wreak havoc, negotiate peace agreements, inspire and motivate, destroy and challenge. In aviation context words can mean the difference between life and death. In 1993 “Pull up, pull up” warning triggered by the Ground Proximity Warning System alerted the pilot of the Chinese Flight 6901 but the pilot could not understand the message and failed to correct their excessive rate of descent. While the pilot and co-pilot were discussing in their native language the meaning of “pull up” the airplane crashed killing 12 and injuring 60 people. Miscommunication has caused a lot of aircraft accidents and incidents all over the world with no discrimination of aircraft type and size or pilot’s race, age, and country of origin. That is why International Civil Aviation Agency (ICAO) has established and nowadays regulates standard rules that govern the exchanges between pilots and air-traffic controllers (ATC.) Amendment 164, added to Annex 1 of the ICAO Language Proficiency Requirements (LPR) stated that all civilian pilots and ATCs must prove their language proficiency by reaching the Operational Level 4 of the ICAO Language Proficiency Rating Scale (Annex 1:1.2.9) Without achieving this minimum level of language proficiency, civilian pilots and ATC are not be licensed and are not be able to perform their job. The radiotelephony phraseology is an organized system for transmission of information, instructions, requests, clearances and advice. It defines what needs to be said in a particular situation, as well as where and how it is said. This is a restricted and coded sublanguage where

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each word and phrase have a precise meaning that is often exclusive to the aviation domain. This radiotelephony phraseology is standardized and together with the plain English, used by pilots and air-traffic controllers in aviation context, it is called aeronautical English by the scholar Anna Borowska (2017:65)

2. DEFINING FORMULAICITY

Some linguists such as Peter Howarth, David Wood, and Alison Wray draw our attention to the extremely important fact that words do not act individually but as parts of lexical or grammatical chunks in interconnected discourse. Despite the fact that language is creative and people can choose a wide variety of words for their oral or written speech, studies of corpora reveal that in any language there are some kinds of linguistic patterns and in many cases there are restrictions in word combinations. Due to the new computerized methods of corpus research, the focus on formulaicity has gradually increased in the 21st century. Researchers have been able to establish frequencies and identify concordances of specific words, to find out pronounced tendencies of collocations in specific professional contexts. Although studies in defining formulaicity still differ, for the last few decades we have witnessed growing consensus regarding the concept. Nevertheless, Alison Wray (2002:9) found about 55 terms which researchers use to talk about formulaic language: set phrases, formulaic sequences, idioms, idiomaticity, collocations, formulas, ready-made utterances, prefabricated routines and patterns, chunks, lexical phrases, lexical bundles, multi-word units, etc. Actually, we need to point out that Wray emphasized that these are not only different terms for one and the same phenomenon – “a full appreciation of what formulaic language is requires us to recognize that we are not dealing with a single phenomenon but rather with a set of more and less closely related ones, across different data types.” Formulaic language is not one entity with uniform characteristics, it is not a “single category” as Howarth puts it, but a category which covers “all significant features of word combinations” (1998:25)

Britt Erman and Beatrice Warren (2000:31) make the distinction between prefabricated and non-prefabricated combinations and provide the following definition for the prefabs: “A prefab is a combination of at least two words favored by native speakers in preference to an alternative combination which could have been equivalent had there been no conventionalization”. However, they themselves admit that “the identification of prefabs is difficult”. Alison Wray prefers the name “formulaic sequence” because “formulaic” is associated with “unity” and “habit” while “sequence indicates that there is more than one discernible internal unit”. The definition which she offers is “a sequence, continuous or discontinuous, of words or other elements, which is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language grammar” (Wray, 2002:9).

The dominant characteristics specified by the formulaicity guru David Wood (2015:3) are:

1. multi word form;
2. have a single meaning or function;
3. be prefabricated or stored and retrieved mentally as if a single word.

It seems that being one whole is the notion common between different perspectives about formulaicity. The idea of wholeness is pretty clear in idioms and phrasal verbs while some other chunks are more difficult to identify as being members of the formulaic family.

Regardless of the name and the emphasized characteristics, formulaic language is omnipresent with its various forms in everyday speech, in literature, in technical and professional documents. Contemporary researchers choose specific corpora and identify the percentage of prefabricated chunks of language. Erman and Warren (2000) found out that 52-58% of texts in corpus are formulaic.

The communication between pilots and ATC is extremely standardized for all routine and a lot non-routine situations. The reason behind this is to enhance safety, to minimize the potential for misunderstandings and to make the exchanges more efficient. The standardization can be found out at different levels: the level of communication strategies - e.g. the use of readback; the level of vocabulary - fixed phrases; the level of grammar - e.g. standard patterns such as "Climb flight level 180 - Climbing flight level 180; Hold position - Holding). This standardized phraseology reflects the restricted semantic and syntax relationship used within the particular aeronautical domain. Formulaicity has seeped into the routine radiotelephony phraseology: multiword forms which do not tolerate anything else but a single meaning, fixed expressions which are used by all speakers of aeronautical English, standardized grammar patterns. Further research in the area of aeronautical English corpora is needed. However, scholars should first agree upon different criteria to identify formulaic sequences and then there will be consistence and reliability of different results.

3. CLASSIFICATION, FORMULAICITY AND THE AERONAUTICAL ENGLISH

As far as the classification of formulaic language is concerned, Wood (2015:37) offers the following categories: collocations, idioms, lexical phrases, lexical bundles, metaphors, proverbs, phrasal verbs, n-grams, concgrams, and compounds.

Collocation is the tendency of two or three words to go together in discourse more frequently than in other word combinations or as Wood formulates it "a syntagmatic relationship among words which co-occur" (2015:38.) The interrelation between the words can be fixed or slightly more flexible; the meaning is literal, rather transparent to everybody. Taking into consideration solely their structure, collocations fall into two categories: grammatical and lexical. A grammatical collocation consists of a key word, a noun, a verb, or an adjective and a preposition or grammatical structure such as an infinitive or clause. Collocations are popular in both plain English and radiotelephony phraseology. In aviation context we can often hear sentences/phrases such as "The airplane is at two o'clock," "They have the permission to do it," "on the alert," "at your own discretion," etc. Lexical collocations consist of nouns, verbs, adjectives or adverbs. Noun phrases for example are: level change, departure information, transition altitude, slot time, etc. Collocations which consist of an adjective and a noun are: active runway, blind transmission, reporting point, final approach, downwind leg, etc. Some examples with a noun and a verb are: bleed to death, plant a bomb, start up the engine, etc. Melcuk cited by Wood (2015:40) classifies collocations in another way based on the relations between the components. One type is "collocations with "light" delexicalized verbs such as do a favor." Some other delexicalized verbs are do, have, take, go, give, get, make; their meaning is defined by the noun they go with: take a turn, make a comment, make a decision, etc. These collocations are somewhere on the continuum between idioms and free combination of words.

The concgrams, in which the components of a phrase are separated by other words in the sentence, are more difficult to be discovered and software assists the process. Lexical bundles are generally a “combinations of three or more words that are identified in a corpus of natural language by means of corpus analysis software programmes” (Wood, 2015:45). Lexical bundles occur in texts within a specific corpus; that is the reason for their existence exclusively in a single discipline. In another example explained by Wood (2015), lexical bundles frequently occur in published academic papers such as journal articles. Biber (2006) realised through his research that the use of lexical bundles in academia is different; natural and social sciences use them more than the humanities. They serve special discourse functions but they do not carry specific meaning. Studying aviation corpora and finding out lexical bundles could assist aviation English trainers into drawing students’ attention to them.

Phrasal verbs, verbs which go with a preposition, a particle, or both, are widespread in terms of everyday usage but in many cases non-native speakers are reluctant to use them. Aviation English trainers should not disregard them because they occur often in routine and non-routine radiotelephony situations: push back, start up, touch down, take off, run up, wear off, jack up, etc. The specific characteristic is that in aviation context the rule is one phrasal verb – one meaning in order to eliminate ambiguity and misunderstandings.

What is the difference between ‘disc brake – brake disc’, ‘flight level – level flight’? Compounds combine minimum two words, one of them being the head word and the other one classifies it. They can be written together, hyphenated or separately. Compounds occur frequently in aviation technical English and the process of forming these combinations is productive: spark plug, cast iron, combustion chamber, relief valve, fuselage-mounted multibarrel 20 mm gun, head-up display, etc.

In the aviation environment there are formulaic sequences which convey the meaning of whole sentences: Ready for immediate departure; Traffic in sight; How do you read?; Cleared via flight planned route. Moreover, a single word can convey the meaning of a whole sentence: Wilco equals “I understand your message and I will comply with it”; Unable equals “I cannot comply with your request, instruction or clearance”; Out equals “This exchange of transmissions is ended and no response is expected.”; Acknowledge means “Let me know you have received and understood this message.”

The aeronautical English avoids all linguistic complexities such as polysemy or impreciseness, as well as idioms, proverbs and metaphors because they could lead to hazardous consequences in the aviation context due to a lack of correctly transferred information. Metaphors are figures of speech, in most cases fixed, which link the concrete and the abstract or compare two items indirectly. Their meaning is not quite transparent but in many cases it can be guessed by the context. Idiom is a fixed expression whose meaning is nonliteral and opaque, it cannot be interpreted from the meanings of its components. There are many idioms which are connected with the aviation, meteorology, and technologies such as ‘on cloud nine’, ‘ahead of the curve’, ‘a straw in the wind’, ‘the redevy flight’, etc. Despite the fact that these expressions have their etymology in aviation, aviation personnel are not encouraged to use them. Exchanges between pilots and air-traffic controllers should not cause ambiguity or confusion. Aviation English must be clear and unambiguous. A well-known rule of thumb for both native and non-native speakers is not to use any idiomatic expressions during flight. That’s why it is pretty strange that the ICAO rating scale states that in level 5 “vocabulary is sometimes idiomatic”. It seems the ICAO descriptors just followed the trend in general English scales and for a moment ignored the basic rule in aviation English for clarity,

simplicity and direct, appropriate and concise language. Hopefully, in the next edition of the rating scale the vocabulary section will be revised and changed according to the aviation guidelines.

On the other hand, there are some expressions which people consider idiomatic but actually they are professional jargon or standard phrases in aviation. ‘Party line communication’ refers to communication when pilots listen to all radio exchanges in the area i.e. their own as well as of the other aircraft; ‘zulu time’ is GMT; ‘sterile cockpit’ rule states that during critical phases of flight such as takeoff and landing, all non-essential activities are forbidden; ‘pushing the envelope’ means that the aircraft is about to fly beyond its designated altitude and speed limit; ‘glass cockpit’ features sophisticated digital flight instrument panel, etc. During communication on the ground one could also hear the technical idiom ‘belt and braces’, or the notorious among cabin crew members ‘bottle to throttle’, or to read articles about the ‘bleeding edge technology’, i.e. deviations from the completely transparent non-idiomatic language.

Fernandez-Parra (2005) claims that “formulaicity is a rather fuzzy phenomenon” and “... the boundaries of formulaicity are very blurry and that it will not be possible to establish very clear dividing lines between formulaic expressions and non-formulaic expressions or between the various classes of formulaic language.” Setting the boundaries of the formulaic language in aviation speech, oral or written, is not an easy task. The classification of the formulaic language assists researchers but it is foggy sometimes which expression to which category fits best and as Wood summarizes “the classifications are in some ways arbitrary” (2015:50). Which expressions are terms and which ones are formulaic sequences; which ones are collocations and which ones lexical bundles; which ones are straightforward and which ones could be ambiguous – questions which need further investigation and research.

4. FORMULAIC LANGUAGE AND FLUENCY

Recently linguists have been studying the correlation between formulaic language and fluency, especially for foreign language learners, and have found out that the increased use of formulaic language facilitates the production of fluent speech. As Wood puts it “From the current stage of knowledge about fluency, it is apparent that formulaic sequences are key elements in fluency development, along with automatization of processing.” (2010:222) Formulaicity makes speech faster, more natural and more fluent, in most cases more accurate, too. ICAO English language proficiency requirements emphasize fluency as an obligatory element of pilots’ and air traffic controllers’ communicative competence. Formulaic language is spread through aviation English. A big percentage of the radio-telephony phraseology for routine situations is formulaic language. Initially formulaic language helps aviation English students to start communicating, later it boosts their language learning and improves the quality of the language output. The automatic use of formulaic language in aviation English has a number of advantages: it provides standardization, it helps avoid confusion and misunderstanding in pilot-ATC exchanges, it frees up memory and processing resources thus leaving the pilot or ATC to do their primary tasks. Wray supports this, though in general context, by saying that “native speakers use formulaic sequence as an easy option in their processing or communication” (Wray, 2002: IX).

The basic function of the formulaic language in aviation context is functional. Numerous radiotelephony phases are aimed at triggering an action and this is the core of the communication – these are orders, requests, offers to act, giving advice, permissions, approvals and undertakings. Such phrases are for instance:

- Request start-up. (Request)
- Immediately climb to flight level 210. (Order)
- Unable to maintain rate of climb. (Refuse to act)

Some other phrases deal with sharing information about the present, future and past events or are concerned with the necessity and feasibility of the orders:

- Changing to N Control on 127.3.
- Unable to approve touch and go due to traffic. Make full stop landing. Runway 27. Cleared to land. Surface wind calm.

Another set of phrases are concerned with the pilot-controller relation and they contain phrases such as confirmations or corrections.

- Confirm reducing speed two five zero knots.
- Correction, changing to frequency 127,575.
- Negative, hold short runway 29L.

Pilots and air-traffic controllers have very distinct roles and some communicative functions are relevant only for pilots, others – only for air-traffic controllers. For instance, only controllers can advise or give orders; however, other functions apply to both of them – for example giving information or asking about necessity. This distinction can be taken into consideration for the teaching context in a very narrow-angle course design: not all the functions need to be taught for both production and comprehension.

Another function is social interaction in professional life. For example, pilots leave ‘a gripe sheet’ to aircraft mechanics with the problems encountered during flight. During non-routine situations like emergency, accidents or incidents pilots and air-traffic controllers exchange information for a limited time. Language should be clear and concise, no doubt formulaic to a certain extent. In addition to this formulaic language plays a major role in developing pragmatic competence. Situation-bound utterances are pragmatic units which occur in standardized communicative situations. Aeronautical communication has numerous predetermined by the situation phrases and formulaic sequences.

A questionnaire, administered to 25 (19 male and 6 female) Bulgarian officer-cadets in the specialties military pilot and air-traffic controller, reveals that they have difficulties with some of the formulaic sequences regardless of their level of language proficiency: A2, B1 or B1+. One of the reasons is the idiosyncratic nature of collocations – e.g. powerful and strong are synonymous in general English contexts but the collocation is ‘powerful engine’; speed, rate and velocity might be the same in general reference but to aviators velocity is a vector, defined by two parameters speed and direction. There is a native language interference due to direct translation: ‘hit wave’ instead of ‘shock wave’; ‘end point’ instead of ‘final approach fix’. Another reason is the difference in collocation use across languages - e.g. in Bulgarian we say ‘силен вятър’ and ‘силен дъжд’ while in English ‘strong wind’ and ‘heavy rain’. Sometimes Bulgarian pilots and controllers encounter difficulties understanding their counterpart’s radio-telephony message because they deviate from the prescribed standard phraseology and they do not use the expected standard phraseology. It is interesting to note that pilots do not blame lack of background knowledge of standard procedures; they blame lack of knowledge of correct radiotelephony phraseology in English. No doubt formulaic language plays a key role into the aeronautical language; however, this role has

not been researched well yet. Another important question, which has no clear answer yet, is how aviation English trainers can efficiently teach formulaic language; how the research work can be applied into classroom practice.

5. CONCLUSION

The communication of pilots and air-traffic controllers features sophisticated technology, high-workload and task-oriented context. The radio-telephony phraseology is characterized with clear, concise language and smooth, unambiguous sentences. The acquisition of formulaic sequences develops the fluency of aeronautical English students, thus, their communicative competence. As mentioned above, according to the ICAO language proficiency scale, fluency is highly required and it determines the language level of the aviation personnel. Our goal is to help aviation English students to produce fluent language which reflects the particular aviation topic on one hand, and encompasses the natural English sentence structure on the other hand. That's why formulaic language studies should be incorporated in an aeronautical English syllabus. The ways to do it is a matter of further research.

Aviation words and phrases are words of power. Idioms, proverbs and opaque expressions can lead to misunderstanding and jeopardize the safety of flights. Collocations, compounds and lexical bundles are important because they constitute a large part of the aeronautical language and provide fluency and natural accuracy. Formulaic language and students' communicative competence are interrelated. The formula to success in aviation communication is to analyze, study, teach and practice formulaic language. Let's go for it!

REFERENCES

- Biber, Douglas. 2006. *University Language: A Corpus Study of Spoken and Written Registers*. Amsterdam and Philadelphia: John Benjamins.
- Borowska, Anna. 2017. *Avialinguistics*. Peter Lang.
- Erman, Britt and Warren, Beatrice. 2000. *The idiom principle and the open choice principle*. DOI: <https://doi.org/10.1515/text.1.2000.20.1.29>
- Fernández-Parra, María. *Translating formulaic expressions in instruction manuals: a corpus study*.
- Howarth, Peter. 1998. Phraseology and Second Language Proficiency. *Applied Linguistics*, Volume 19, Issue 1, April 1998, Pages 24–44, <https://doi.org/10.1093/applin/19.1.24>
- ICAO. Annex 1. <https://www.icao.int/safety/lpr/Pages/Language-Proficiency-Requirements.aspx>
- International Civil Aviation Administration/ICAO. 2010. *Manual on the Implementation of ICAO Language Proficiency Requirements Second Edition*. Doc 9835.
- Retrieved from: https://www.researchgate.net/publication/242203407_translating_formulaic_expressions_in_instruction_manuals_a_corpus_study
- Wood, David. 2015. *Fundamentals of formulaic language*. Bloomsbury.
- Wood, David. 2010. *Formulaic language and Second Language Speech Fluency*. Continuum International Publishing Group.
- Wray, Alison. 2002. *Formulaic language and the lexicon*. CUP.