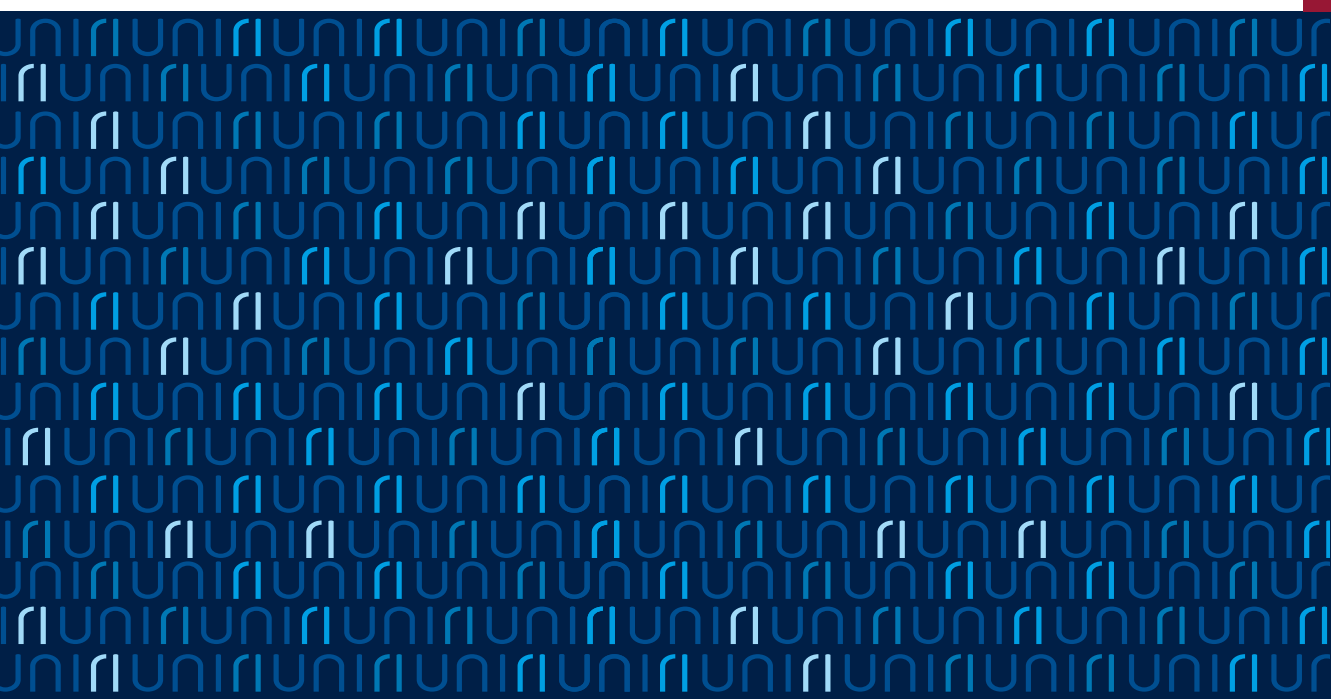


Edited by
Katja Dobrić Basanež
Mihaela Matešić
Jana Jurčević

Figurative Language in Use: Metaphorical Collocations and Beyond



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University of Rijeka
Faculty of Humanities and
Social Sciences

Edited by Katja Dobrić Basanež, Mihaela Matešić, Jana Jurčević

FIGURATIVE LANGUAGE IN USE:

METAPHORICAL COLLOCATIONS AND BEYOND

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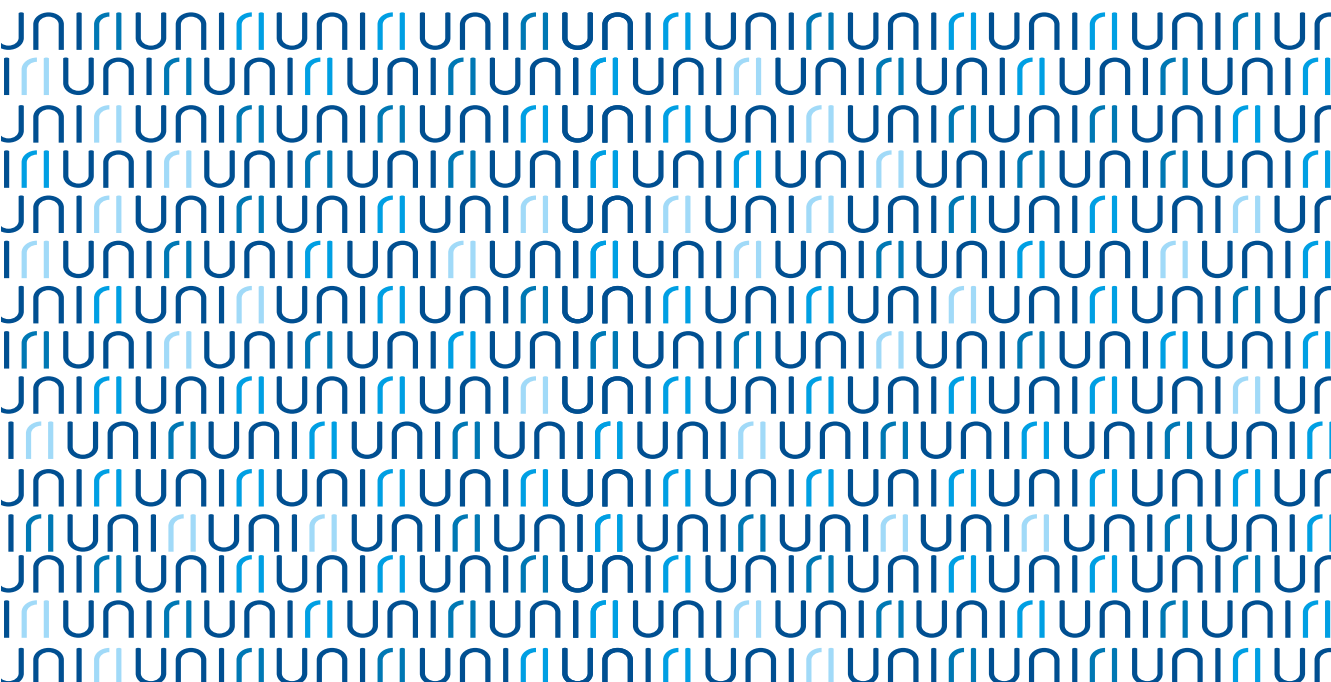
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Metaphorical Collocations from a Specialised Text-Typological Perspective

Alessandra Zurolo

The chapter outlines the methodology and preliminary results of a pilot study designed to provide a structural and functional account of conceptual metaphors and their significance for the description and classification of specialised text types. The study focuses on the language of medicine, but the results can be applied to other specialized languages as well. The data presented in this chapter form part of a larger study that aims to uncover text type-specific uses of conceptual metaphors in specialised and scientific communication. The chapter starts with a brief introduction to the theoretical foundations of the study, which are rooted in both specialised text-type linguistics (German *Textsortenlinguistik*) and metaphor research. It then illustrates some of the results, before outlining possible directions for further research.

Keywords: metaphorical collocations, medicine, text-linguistics, Language for Specific Purposes, Deliberate-Metaphor-Theory

1. Theoretical background

1.1. The text(type) as a scientific object of study

The description and analysis of texts represents one of the most complex and controversial fields of study in the history of modern linguistics. In his introduction to text linguistics, Adamzik (2016) provides a comprehensive overview of the intricate history of the field's development, tracing its evolution in linguistics from the structuralist perspective of its early stages to the cognitivist approaches that currently define much of text linguistics. In addition, she highlights the manifold still debated issues that continue to shape the field. The variety of analytical models and definitions of text that have emerged over time makes it essential to begin any analysis of textual studies with a clear delimitation of the approach being used, as this is directly related to the specific perspectives on the phenomenon under investigation. This study is grounded in the following definition of text types, as articulated by Brinker et al.:

Textsorten sind konventionell geltende Muster für komplexe sprachliche Handlungen und lassen sich als jeweils typische Verbindungen von kontextuellen (situativen), kommunikativ-funktionalen und strukturellen (grammatischen und thematischen) Merkmalen beschreiben. Sie haben sich in der Sprachgemeinschaft historisch entwickelt und gehören zum Alltagswissen der Sprachteilhaber; sie besitzen zwar

eine normierende Wirkung, erleichtern aber zugleich den kommunikativen Umgang, indem sie den Kommunizierenden mehr oder weniger feste Orientierungen für die Produktion und Rezeption von Texten geben. (Brinker et al. 2014.: 139)⁵⁶

The definition illustrates the intricate and multidimensional nature of the text type as an object of linguistic study. This complexity is a consequence of the observation that the interrelated extra-linguistic factors of context and, above all, function play an essential role in the linguistic structure. Furthermore, these factors have a significant impact on the connection between linguistic elements, which appears synchronically rather fixed and static. However, this connection has in fact developed historically. A comparable level of complexity characterises the notion of a specialised text. This is typically identified in accordance with Lothar Hoffmann's traditional definition, which remains valid today. It is described as an instrument and outcome of communicative activity in specialised contexts. It is a complex linguistic and structural entity, reflecting the inherent complexity of both mental and extra-linguistic reality:

Instrument und Resultat der im Zusammenhang mit einer spezialisierten gesellschaftlich-produktiven Tätigkeit ausgeübten sprachlich-kommunikativen Tätigkeit; er besteht aus einer endlichen, geordneten Menge logisch, semantisch und syntaktisch kohärenten Sätze (Texteme) oder satzwertiger Einheiten, die als komplexe sprachliche Zeichen komplexe Propositionen im Bewusstsein des Menschen und komplexen Sachverhalten in der objektiven Realität entsprechen. (Hoffmann 1985: 233f)⁵⁷

Pragmatically oriented approaches present a variety of models for the description and classification of specialised text types. In the field of German LSP research, they have been traditionally classified according to the socio-functional categories of 'internal' and 'external' communication (see Gläser 1990; Göpferich 1995). These categories are based on the different hierarchically structured levels of specialised communication. Consequently, texts employed for the communication between experts are classified as 'internal', while texts intended for the communication between experts and laypersons are designated as 'external'. Regarding metaphor analysis, the implication of such categorisation is that the use of metaphors may also serve as an indicator of group membership (for investigations aiming at highlighting the link between metaphors and specialised discourse; see Herrmann and Sardinha 2015). However, an analysis of textbooks

56 "Text types are conventionally valid patterns for complex linguistic actions and can be described as typical combinations of contextual (situational), communicative-functional and structural (grammatical and thematic) features. They have developed historically in the language community and are part of the everyday knowledge of language participants; although they have a standardising effect, they also facilitate communicative interaction by providing communicators with more or less fixed orientations for the production and reception of texts."

57 "Instrument and result of the linguistic-communicative activity carried out in the context of a specialised social-productive activity [conceived]; it consists of a finite, ordered set of logically, semantically and syntactically coherent sentences (textme) or sentential units which, as complex linguistic signs, correspond to complex propositions in human consciousness and complex facts in objective reality".

and popular science texts reveals the problematic nature of such categorisation. Both text types are functionally quite complex, and this complexity is reflected in their structural features. Academic textbooks serve as an introduction to new scientific fields, presenting and, where necessary, clarifying the established state of research in the respective subject area (see Bongo 2008; Zurolo 2022). They employ subject-specific terminology and facilitate learners' acquisition of the required knowledge and scientific, i.e. specialised language proficiency by highlighting the distinctive features of such linguistic field (i.e. terminology regarding its specific meaning, internal relations and contexts of use). In accordance with the typology outlined above, these texts can be situated at an intermediate level of specialised communication, occupying a position that bridges the gap between internal and external communication. There are numerous similarities between the characteristics of academic textbooks and those of popularisation texts. Consequently, Göpferich (1995) categorised both types of text under the same class at the initial levels of abstraction, differentiating them solely on the basis of the manner in which they present knowledge. However, popularisation does not provide a systematic overview of the established state of research. Instead, it typically selects one or more scientific phenomena and transforms them into knowledge accessible to the public and, in some cases, into news. As a result, research knowledge is reformulated and recontextualised (see Bongo and Caliendo 2014; Gotti 2014). It also exhibits a high degree of interdiscursivity, as the knowledge is transformed into a press release that can appeal to and interest a very general audience with the most differentiated educational backgrounds. In addition to their descriptive and explanatory functions, popular science texts display a range of other characteristics, the specifics of which may vary according to context and historical circumstances. The press plays a significant role in the formation of public opinion. It is also evident that this must be reflected in the use of metaphors. Therefore, it is crucial to integrate metaphor analysis with the functional description of text types in the context of specialised communication. This entails not only the identification of conceptual patterns and their linguistic manifestations, but also the determination of their communicative contribution.

1.2. (Metaphorical) collocations and textual analysis

As words that are frequently co-occurring and ubiquitous in both oral and written usage (Targońska 2014: 128), collocations, among other structural linguistic elements, could be associated with specific characteristics of text types that are functionally determined. Despite their pervasive presence, the precise definition of this phenomenon has not always been clear. In the view of Burger (2010: 38, 52), collocation is regarded as a non-idiomatic or weakly idiomatic phraseological unit. The fact that it exhibits a lower degree of idiomaticity in comparison to other phraseological phenomena has resulted in a certain degree of neglect of such linguistic phenomena in phraseological research. Following an initial period of marginalisation, collocations have now become a central focus of phraseological interest. Furthermore, it has been acknowledged that they are integral to foreign language proficiency. A systematic analysis of metaphorical collocations from a contrastive perspective could, therefore, elucidate differences in the linguistic

structure and facilitate the use of such knowledge in the domain of foreign language learning for various communicative purposes. From a methodological standpoint, the incorporation of computational linguistic tools into qualitative analysis is a valuable approach. Nevertheless, this does not imply that qualitative analysis should be entirely disregarded. Since, according to the Duden dictionary, collocations ultimately represent the “content-related combinability of linguistic units”⁵⁸, qualitative analysis facilitates the investigation of semantic connections or affinities between word combinations. It is evident that collocations emerge within the context of established grammatical and semantic connection rules. These can be in fact also defined as “characteristic, frequently occurring word combinations whose common occurrence is based on a regularity of mutual expectability, i.e. is primarily semantically justified” (Bußmann, 2008: 345). However, the definitive proof that a particular word combination is indeed a collocation is the frequency of its occurrence, which can only be accurately discerned through rigorous corpus linguistic analysis. Lemnizer and Zinsmeister define collocation in the context of corpus linguistics as “the repeated co-occurrence of two words in a structurally interesting unit,” whereby “in a collocation, one word influences the selection of another word in favour of words with the same or similar meaning” (2006: 196). The concept of content-related combinability is also connected to the concept of metaphorical collocation, which requires further clarification. The definitions of metaphorical collocations are multifaceted and not always convergent, as Patekar (2022) observes in his review of relevant literature on the subject. He defines metaphorical collocations as “a specific type of collocations, in which one component, the collocater, is used figuratively, thus resulting in the metaphorical meaning of the whole collocation” (2022: 44). While this definition applies to most of the cases identified in this work, there are also examples of collocations in which the base itself is derived from a conceptual metaphor. For instance, the term “Killerzellen” in the collocation “natürliche Killerzellen” can be interpreted as a linguistic manifestation of the military metaphor (see 2.1. and 2.1.1.). Therefore, a broader definition of metaphorical collocations is required. In this work, metaphorical collocations are understood as fixed (metaphorically connoted) word combinations that are typically based on pre-existing conceptual patterns. It is, in fact, assumed that new metaphors would not be recognisable in conventional structures, such as collocations. However, the data collected indicate that such conventional patterns, which in literature are occasionally also referred to as *dead*, are still in use and are being reinterpreted in creative ways, particularly in popularisation. The determination of metaphorical collocation is closely linked to the question of word combination or the semantic compatibility of two words. Such compatibility can be established metaphorically, that is to say, through a targeted and systematic transfer between two semantic domains. In the case of metaphorical collocations, this entails that one part of the word unit reveals the properties (or the semantic elements projected into the target domain) of the other part, characterised metaphorically. To exemplify this, we may consider the very common phrase “Zellen / Viren angreifen”. The verb *angreifen*

58 “inhaltliche Kombinierbarkeit sprachlicher Einheiten“ (definition 2a) <https://www.duden.de/rechtsschreibung/Kollokation>, last visited 26/11/2024

(to *attack*), which evokes the underlying schema of cells or viruses as either aggressors or victims (i.e. the war metaphor), reveals contextual elements of the other component, namely that cells can be capable of action and aggressive. The projection of semantic elements is metaphorically determined, and the fact that such a metaphorical basis is not perceived as such at first glance shows that it is an established or consolidated part of language use. In conclusion, a metaphorical collocation can be defined as a fixed, partially idiomatic word combination with a collocator that exhibits different variants of meaning. To identify metaphorical collocations, it is therefore necessary to determine whether the collocator exhibits different variants of meaning and to identify the specific meaning it conveys in a given context, whether lexicalised or contextual.

2. The study

To determine possible collocations, a small sample corpus consisting of two textbooks on virology and selected popular science articles on the new coronavirus from the weekly magazines *Die Zeit* and *Der Spiegel* has been used. The following textbooks on Virology have been analysed:

- Modrow et al. (2010): *Molekulare Virologie*. Spektrum. Heidelberg.
- Mims et al. (2004): *Medizinische Mikrobiologie Infektiologie. Mit Virologie und Immunologie*. Elsevier GmbH, Urban & Fischer Verlag. München.

Due to the extraordinary event and the particularly difficult situation, purely medical concepts (such as *infection and vaccination*) required during the pandemic a targeted explanation for the public. To obtain thematically coherent results, keywords related to the topic of vaccination, which has received a lot of attention in popularisation, have been selected from the corpus of popularised texts containing circa 37000 words: *Virus; Immunsystem; immunologisch; Impfung; Antikörper; Protein; Zelle; mRNA, (Krankheits-)Erreger* (i.e. *virus; immune system; immunological; vaccine; antibody; proteins; cells; mRNA, disease agent*). The repeated use of such words with specific other words whose semantic connection is metaphorical have been noted as (possible) metaphorical collocations. Those combinations were then compared to the frequency of their occurrence in deTenTen23 to see if they are indeed common in language use in this form. The linguistic metaphors have been identified following the guidelines of the Metaphor Identification Procedure (Pragglejaz Group 2007 and Steen et al. 2010, as well as Hermann et al. 2019, who adapted the procedure to German). The detected domains of origin largely correspond to the domains already identified in the literature: in addition to *space* and *personification*, above all *war, communication* and *machine*.

2.1. Results

In LSP communication, collocations might appear in different forms, thereby also showing different linguistic behaviours (cfr. e.g. L'Homme 2009; 2000; L'Homme & Bertrand 2000). L'Homme (2009: 15) moves from a general definition of collocation as an “unpredictable combination of lexical units” and reflects on the specific forms they display in LSP communication, as a starting point to suggest possible organisation criteria in specialised dictionaries. Particularly relevant to the description of the results of this study is her suggestion that in specialised contexts the keyword (i.e. the base) might be a term, which directly imposes the choice of the collocate (L'Homme 2009: 16). L'Homme & Bertrand (2000) had in fact highlighted how such specialised lexical combinations should be treated differently than general collocations, since “collocations are conventional within a given linguistic community; [while] SLCs are conventional within a group of specialists” (L'Homme & Bertrand 2000: 498). Contrary to general collocations, in specialised lexical combinations “many lexemes defined as co-occurents can combine with groups of semantically related terms” (L'Homme & Bertrand 2000: 498). In this regard, their behaviour seems to reflect a group of combinations found in this study, that needs to be distinguished from the strictly terminological word combinations. In this chapter, two kind of recurrent word combinations have been found. The group named “terminological units” refers to the ones that have been lexicalised as a whole and are to be regarded as part of technical language in the narrower sense: the co-occurrence of the adjective *natürlich* with the compound *Killerzellen* in the unity “*natürliche Killerzellen*”⁵⁹ (natural killer cells), for example, denote in the medical field specific cell types that can not be named otherwise: their designation is part of the terminology. The term *Killerzellen* is not used in other contexts and imposes the choice of the adjective *natürlich*. The same applies to “*programmierter Zelltod*”⁶⁰ (programmed cell death) and partially to “*virale Immunevasion*” (viral immune evasion), even if the process of immune evasion can also apply to other micro-organisms and tumour cells⁶¹. In some cases, such as in “*natürliche Killerzellen*”, the reference to English must also be considered for such collocations. Many collocations contain, in fact, English elements, so that the unit also involves cases of code-switching and is lexicalised in the language system as such, or they are structurally based on semantically equivalent English collocations. A systematic comparison of English and German teaching texts could be of great benefit in this respect for the academic communication and the training in foreign language contexts. In purely theoretical terms, this could also clarify the extent to which the German language still uses its structural potential for innovation in an increasingly English-dominated academic world. Other types of collocations have been classified as “Specialised Lexical Combination” following L'Homme & Bertrand (2000): they show a high frequency of co-occurrence in the medical field, where they have acquired a specific meaning, but the combination itself does not represent a terminological unit. For example, even if the base

59 <https://flexikon.doccheck.com/de/NK-Zelle>

60 https://flexikon.doccheck.com/de/Programmierter_Zelltod

61 <https://flexikon.doccheck.com/de/Immunevasion>

“Abwehr” most frequently appear with the collocate “immunologisch” in textbooks, this kind of collocation cannot be defined as terminological: firstly, because the word “Abwehr” (contrary to “Killerzellen”) itself is not a term, but rather a general word used in different medical contexts to denote also slightly diverse medical processes (from an anatomical, physiological and microbiological perspective). Moreover, “Abwehr” does not always occur in combination with „immunologisch“: “körperliche / körpereigene, interferonvermittelte, angeborene, humorale, wirkungsvolle / effective, extrazelluläre, spezifische / unspezifische, oberflächliche Abwehr” are among the combinations also attested in the textbooks. However, they show a clear lower frequency (in most cases the combination only appears once) than “immunologische Abwehr”. Since the frequency of co-occurrence with “immunologisch” is clearly higher, this kind of word combination has been classified as collocation, and since the co-occurrence is not required by the terminological system of the field, the collocation has been termed in this chapter “Specialised Lexical Combinations”, following the terminology introduced by Homme & Bertrand (2000), thereby implying that the co-occurrence is typical for the medical communication, even if it does not belong to its specific terminology. Despite the fact that these two categories have been explicitly delineated to categorise the findings of this analysis, they could potentially be integrated into the existing pertinent literature on the subject. It can be hypothesised that collocations in LSP communication can be classified in a similar way to the (pragmatic) classification of terms, which varies according to different semantic and textual parameters, in particular the degree of semantic (i.e. terminological) specificity and the context of use (Roelcke 2010: 56).

2.1.1. The WAR metaphor

The war metaphor is particularly well-known in medical communication research and was criticised for its psychological implications even before the pandemic (see the famous non-linguistic but groundbreaking work by Sontag 1990). During the pandemic, however, it acquired a new relevance from a collective point of view (Semino 2021). It is probably one of the oldest patterns of medical communication. Its roots lie in ancient classical medicine of Greek origin (Bauer 2006). Regarding the topic selected for this study, traces of this conventional metaphor can be found in linguistic metaphors that depict the immune system as a protective force, viruses (or pathogens) as enemies to be fought and, where appropriate, attackers and vaccines as weapons. There are collocation instantiating these patterns:

Specialised Lexical Combination	Terminological units
Immunologische Abwehr (SE = 62; P = 0; L = 5) ⁶² Eindringende Erreger (SE = 83; P = 0; L = 8) Virus angreifen (SE = 276; P = 2; L = 0)	Natürliche Killerzellen (S = 584; P = 0; L = 35)

The metaphorical scheme also serves as the basis for terminological collocations,

62 The abbreviations SE, L and P stand for Sketch Engine; Lehre (teaching) and Popularisation

i.e. word combinations that have a terminological value, whose meaning has been established in this form, such as “natürliche Killerzellen”, i.e. natural killer cells. From the quantitative data, it appears that the sample corpus of popularisation was not of great importance in determining the collocations, as they were not statistically significant. Indeed, such a corpus, consisting of approximately 37,000 words, is too small to provide representative data in quantitative terms. Nevertheless, these articles do appear to be relevant from a qualitative point of view, particularly regarding functional and text-type contrastive description. In popularisation, however, the war metaphor does not occur frequently in collocation. It is rather used in various unconventional ways:

1. So lernen sie [d.h. Immunzellen], mit welchen **Waffen** sie dagegen ankommen. Der Körper legt gewissermaßen **ein Arsenal** an für den Fall einer künftigen Ansteckung (Zeit Online 04/2021).⁶³

The underlying cognitive schema is not shown here in the form of collocations, i.e. established and conventional word combinations, but in a new, creative way, as the example shows, in which the functioning of the immune system is equated with an arsenal. The aggressiveness of the virus as an enemy was strongly emphasised in popularisation, especially in the first phase of the pandemic. A further development of this metaphor can be found on the cover of Der Spiegel 15/20. The issue is entitled “Das Pleitevirus. Wie Corona unsere Wirtschaft infiziert, Jobs und Wohlstand frisst”⁶⁴. The front cover displays a series of banknotes, which metonymically refer to the economy being progressively devoured by the virus, thereby presenting the economy as the victim of the virus’s aggressiveness. The same domains are re-used verbally in the same issue to express similar ideas:

2. Und wer entscheidet eigentlich, wie lange wir **Zombies am Leben halten**: Unternehmen, die auch vor Corona schon kriselten [...] und nun dank Staatshilfe eine **künstliche Lebensverlängerung** erhalten?⁶⁵ (Der Spiegel 15/20: 15)

In such a framework, where health and political and financial issues are metaphorically combined, the cost-benefit analysis that tragically governs military operations can be applied to the health system, thus to the economy and ultimately to life itself.

63 ‘In this way, they [i.e. immune cells] learn which weapons they can use to fight back. The body builds up an arsenal, so to speak, in case of a future infection’. (<https://www.zeit.de/wissen/gesundheit/2021-04/funktionsweise-corona-impfstoff-mrna-impfung-immunitaet-immunsystem-vektor-proteinbasiert>), last visited 29/11/24.

64 <https://www.spiegel.de/spiegel/print/index-2020-15.html>. „The bankrupt virus. How corona is infecting our economy, devouring jobs and prosperity“

65 ‘And who actually decides how long we keep zombies alive? Companies that were already in crisis before coronavirus [...] and are now being given an artificial extension of life thanks to state aid?’

2.1.2. The MACHINE metaphor

Another schema that is historically deeply rooted is the machine metaphor: its roots go back to the Enlightenment. The best-known form of this metaphor is used to describe the brain, which is depicted as a computer (s. Goschler 2008). The parts that can be considered defective can be not only organs or tissues, but also the smallest living units of the organism, the cells, as in this corpus, which consists of textbooks on virology, thus focussing on the smallest organic units. These small units are regarded as technical elements that serve to programme devices:

Specialised Lexical Combination	Terminological units
Defekte Viren (SE = 2; L= 4; P= 0) Zelle programmieren (SE = 19; P = 2; L = 4)	Programmierter Zelltod (SE= 335 P= 0; L= 19)

However, the machine metaphor is also particularly well suited to describing the relationship between the parts and the whole of the body: If a part is defective, it can be healed or repaired in isolation. This metaphor therefore focuses not on holistic, but on selective representation of the body. Consequently, this has advantages from a therapeutic-surgical perspective, but also some limitations. Viewing organic phenomena as isolated units sometimes makes it difficult to recognise connections, as this example from popularisation shows, in which an established conventional metaphor is reinterpreted. The underlying idea that the body is a machine can, in fact, be recognised in this example of the treatment of Long Covid and the associated symptoms, the connection between which has not yet been explained:

3. Mein Kollege David Putrino und ich haben diese Prozesse deshalb mit Zahnrädern verglichen. Bei manchen Patienten drehen sich vielleicht zwei oder drei **Zahnräder** – Autoimmunität, eine anhaltende Virusinfektion und chronische Schäden der akuten Infektion – und sorgen für Folgeprobleme. Bei anderen dreht sich nur ein Zahnrad, mit der Konsequenz, dass es andere Folgeprobleme gibt. Wir sind bisher aber noch nicht vollends in der Lage, zu sagen, bei welchem Patienten sich welche Zahnräder drehen (Die Zeit 23/2023)⁶⁶.

This shows the potential, but also the limits of such metaphors: the impossibility of recognising the processes behind the movement of the cogwheels also results in the difficulty of treating the disease. Such processes could be probably visualised from a comprehensive, i.e. holistic, perspective.

66 'My colleague David Putrino and I have therefore compared these processes to cogwheels. Some patients may have two or three gears turning - autoimmunity, a persistent viral infection and chronic damage from the acute infection - causing secondary problems. In others, only one cogwheel is turning, with the consequence that there are other secondary problems. However, we are not yet fully able to say which cogwheels are turning in which patients'.

2.1.3. *The (technical) COMMUNICATION metaphor*

A metaphor constellation specifically linked to the representation of abstract concepts as living organism concerns communication metaphors: microbiological elements (such as cells, proteins, but also viruses and bacteria) are not only personified, but also endowed with the ability to communicate with each other. This metaphor is already hidden in some medical terms: the abbreviation mRNA stands, for example, for messenger ribonucleic acid (also known as messenger RNA or messenger RNA), because it carries genetic information and must “communicate” such information to produce proteins correctly. These proteins are then transcribed or translated. The information to be transferred serves the metaphorical structure of the proteins, which are therefore depicted as buildings, among other things. The explanation of how mRNA works is also provided by the re-emergence of this metaphor in popularisation, in the context of the production of vaccines based on mRNA. The two schemes (MACHINE and COMMUNICATION) are often combined, especially in popularisation. Here there are two examples from *Der Spiegel*, where the (not yet manufactured) vaccine is presented as a technical product:

4. Die Wissenschaftler des Unternehmens glauben, mit der mRNA den Schlüssel gefunden zu haben, um »**die Software des Lebens**« umschreiben zu können.⁶⁷ (*Der Spiegel* 44/2020: 15)
5. »Der Biontech-Impfstoff ist vergleichbar mit einem **iPhone von Apple**«, sagt Analyst Kraus. »Er ist ein Produkt, das viele Menschen unbedingt haben wollen und für das sie auch bereit sind, entsprechend mehr zu bezahlen.«⁶⁸ (*Der Spiegel* 25/2021: 100)

Instead of mRNA or DNA (as in the collocations), the software of life is rewritten here and the vaccine in the second example is presented as a technical-communicative luxury product. This unconventional use of an otherwise very conventional metaphorical pattern does not have a purely descriptive function, but it serves to create a positive representation of the vaccination, which was necessary at the time of the pandemic (to convince society of the importance and necessity of the vaccination despite fears and doubts). We can therefore claim that popularisation articles have a persuasive function.

2.1.4. *The SPACE metaphor scheme*

In the collocations identified, further metaphorical schemes can be recognised that are particularly productive in everyday communication, such as the already mentioned personifications and the so-called spatial metaphor, which is responsible

67 “The company’s scientists believe that with mRNA they have found the key to rewriting ‘the software of life’“.

68 “The Biontech vaccine is comparable to an iPhone from Apple,” says analyst Kraus. “It is a product that many people really want and for which they are prepared to pay more”“.

for equating abstract processes with movements in space. The latter is especially productive and has specific characteristics in medical communication. For example, viruses can escape the immune system or the immune response, and terms such as ‘Virale Immunevasion’, a process that enables viruses to escape the immune response, are based on this metaphor:

Specialised Lexical Combination	Terminological units
Verlauf der Infektion (L = 25; SE = 526; P = 0) Immunantwort entgehen (L = 16; SE = 9; P = 0) Immunsystem entgehen (L = 3; SE = 23; P = 0)	Virale Immunevasion (SE = 1; P = 0; L = 2)

Linked to this immunological phenomenon is also the process of viral mutation (as viruses mutate to escape the immune system), and popularisation shows how this conventional metaphor is also being reopened and used creatively to explain this process:

6. Das Virus **kann** an vielen Stellen **in seiner Evolution nicht mehr ohne Weiteres zurück**. [...] ZEIT: Das Virus **ist in eine Sackgasse geraten**? [...] Drosten: Ja, genau, oder es bräuchte eine Art Revolution, durch erneute massive Verbreitung irgendwo auf der Welt, wo das jetzt noch möglich ist (Die Zeit 48/2022: 36)⁶⁹.

3. Discussion

The sample corpus shows that certain collocations are favoured in educational (con)texts. However, when comparing them with the data from Sketch Engine (Killgarif et al. 2004), it should be noted that their use in the press is not excluded. The sample therefore cannot be interpreted as a direct correlation in the sense that certain collocations (can) only occur in one type of text, but that they are more likely to occur in certain types of text or at certain specialised communicative levels. However, as deTenTen23 is primarily based on internet sources, these findings should be checked in the context of a larger corpus of educational texts. Naturally, this paves the way for further future research. Nevertheless, the data used in this study indicate that a possible connection between the analysis of specialised text types and metaphor research could be traced in the form and function of metaphorical units: Since university textbooks are intended to convey canonical knowledge, established conventional linguistic patterns are more frequently used there, which in most cases are used in an equally conventional linguistic form and are only rarely changed for didactic purposes. Such conventional forms often occur in the form of collocations, i.e. as fixed word combinations. Following Steen (2008; 2015), these forms of use can be labelled “non-deliberate”.

69 “At many points in its evolution, the virus can no longer go back. [...] ZEIT: Has the virus reached a dead end? [...] Drosten: Yes, exactly, otherwise it would need a kind of revolution by spreading again on a massive scale somewhere in the world where it is still possible”.

In popularisation, research knowledge is communicated for different, sometimes historically varying purposes: Knowledge transfer is not a mere simplification, but a reformulation and re-contextualisation of research knowledge (Gotti 2014). In this context, even highly conventionalised (i.e. “closed” following Camus 2015: 251) metaphors can be “reopened” (ibid.) and, in some cases, reinterpreted for specific purposes. The function is partly informative, but also partly persuasive. It therefore contains “deliberate uses” (Steen 2015) of metaphors: Speakers consciously choose a particular metaphorical schema and signal its use to fulfil a specific function. This is particularly evident when analysing the vaccination debate during the pandemic, which, not surprisingly, features many creative uses of conventional metaphorical schemata that have also been identified as the basis of collocations in learning contexts. Indeed, when the vaccines were produced, it was necessary to run a sort of vaccination campaign in the press as well, to convince the society of the importance of vaccination as a way out of the pandemic. Positive representations of vaccines that could be interpreted in such a framework include the depiction of the vaccine as a butterfly on the cover of *Die Zeit* 11/2021 entitled “Freiheit für Geimpfte?”⁷⁰ – i.e. freedom for vaccinated? – and the role implicitly assigned to vaccination by the depiction of the pandemic as a labyrinth on the cover of *Die Zeit* 03/2022, entitled “Zurück in die Freiheit?”⁷¹ – i.e. back to Freedom. The concept of the body as a machine and the processes as communication or technical communication is linked to the creative representation of the vaccine as a technology and as a technical programme. The fact that vaccination is depicted as a technology is also reflected in the common compound term ‘Impftechnologie’, i.e. ‘vaccination technology’. A further development of this metaphor can be found in the examples 3 and 4 in which the vaccine is presented as a technical luxury product. To present the vaccination in a positive light, the conventional metaphor is used creatively and reinterpreted for a specific communicative goal, namely in this case persuasion. To summarise, it can be noticed that the functional differences between the text types correlate with the creativity of established metaphorical schemata: The lexicalisation of historically established schemata, which manifests itself in the use of metaphorical collocations, does not lead to the disappearance of creative potential. On the contrary, this potential is in a sense “revived” to fulfil certain functional purposes, such as the persuasive function that can occur in the field of popularisation. However, the same schemata are also used creatively for didactic purposes, both in educational texts and in popularisation. At a broader level, therefore, the conclusions can be formulated in line with the pragmatically orientated work of Gerard Steen (2008, 2015), who distinguishes between the “deliberate” and “non-deliberate” use of metaphors. The metaphorical collocations can be interpreted as signs of “non-deliberateness”, since the metaphorical associations are nonintentional, conveyed in conventional fixed forms and based on historically established patterns. However, it cannot be excluded that the same metaphorical schemes are also used deliberately for a specific communicative function: when this occurs, their linguistic form is rather unconventional. Indeed, this use seems

70 <https://epaper.zeit.de/abo/diezeit/2021/11>

71 <https://epaper.zeit.de/abo/diezeit/2022/03>

to directly correlate with the text type analysis on a genuinely functional base. In addition, general language collocations can be reinterpreted in the context of medical concepts and in turn linked to specific authorial intentions and text type functions. To conclude, certain forms of metaphor use correlate with the characteristics of the respective text types. The communication of 'established scientific knowledge', which is partly metaphorically characterised, takes place through established or consolidated linguistic forms that are also metaphorically characterised, such as collocations. The same metaphorical domain is used creatively in popularisation, and this use correlates with two functional aspects of this text type class, namely interdiscursivity (or the interrelation between different disciplinary domains or discourses), which is also a form of re-contextualisation, and the reformulation of disciplinary knowledge into a press release. The analysis of textbooks in German, a language that is not dominant in international communication, also reveals the importance of systematising metaphorical collocation belonging to the so-called "AWS" ("Alltägliche Wissenschaftssprache" see Ehlich 1999), i.e. general scientific language. The structural (lexical and grammatical) components of the general scientific language are not discourse or field-specific, but rather define the common ground of the scientific communication as such; they derive from everyday communication but acquire specific functions in scientific communication, given that they portray the intrinsic nature of the scientific process itself. Such process is inherently abstract and therefore necessitates metaphorical representation (see Graefen 2009). The most prevalent metaphors in general scientific communication include the notion that ideas are solid entities (e.g. *die Studie basiert auf eine Theorie*, i.e. the study is based on a theory) or that knowledge is a form of perception (e.g. *die wissenschaftlichen Gegenstände erkennen*, i.e. to recognize the scientific objects), as well as the already-mentioned spatial metaphors (e.g. *die gesammelten Daten führen zu Schlussfolgerungen*, i.e. the data collected lead to conclusions). A systematic comparative description of these phraseological units between national non-dominant languages and English as the lingua franca of the international scientific communication has yet to be undertaken, and this would be of great importance for both scientific communication and foreign language acquisition. The acquisition of scientific textual competences, i.e. the skills necessary to understand and produce scientific texts, is in fact one of the most challenging aspects of language acquisition. Considering the issues outlined above, future research should also endeavour to expand the sample corpus for qualitative and quantitative analysis, extend the diachronic perspective to encompass popularisation and other fields of research, and consider the focus on the language-contrastive perspective and the relationship between German as a scientific language and English.

3.1. Final remarks

In terms of (pragmatic approaches to) conceptual metaphor theory, the results contribute to the analysis and classification of text typologies in specialised communication by tracing possible links between the use of metaphorical collocations and other types of word combinations, such as terminological units, which may themselves be based on established metaphorical patterns, e.g. in the

domains of WAR, MACHINE, COMMUNICATION and SPACE. Unfortunately, the sample corpus on popularisation is too small to produce quantitatively significant results at this level. Specifically, only the collocations “Virus angreifen” and “Zelle programmieren” were found in the popularisation sample corpus. However, the sample is highly relevant with regard to the use of “deliberate metaphors” (Steen 2008, 2015). In this sense, metaphorical collocations that rank higher in textbooks and in deTenTen23, which is based on different internet sources – possibly reflecting different levels of specialisation – can be interpreted as signs of “non-deliberateness” (Steen 2015; 2023) of metaphor use and functionally linked to genre classification; they would in fact reflect the routinised use of language specifically required in the higher levels of LSP communication. A creative reformulation of these metaphorical fixed forms can be avoided at the higher levels of abstraction, as partially needed in academic textbooks, because of the need to make communication as precise as possible. Such reflections and creative uses seem to correlate, on the contrary, with the functional features of popularisation. The functionally determined reinterpretation of the metaphorical schemes that underlie such conventionalised forms, in fact, proves that the influence of their creative potential is still alive. On the other hand, it also suggests there is a need to integrate the analysis of metaphorical collocations in LSP communication into a multilevel and multimodal analytical framework. More specifically, the data suggest that metaphorical collocations in specialised (con) texts need to be analysed according to the combination of parameters arising from their communicative behaviour, the established terminological system and their relationship with already established metaphorical schemes.

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