

Magdalena Zawisławska

Metaphor and Senses

The Synamet Corpus: A Polish Resource
for Synesthetic Metaphors



Magdalena Zawisławska

Metaphor and Senses

The book deals with the synesthetic metaphors in Synamet – a semantically and grammatically annotated corpus. The texts included in the corpus are excerpted from blogs devoted to, among others, perfume, wine, beer, music, art, massage and wellness. The thesis presents a Conceptual Metaphor Theory (CMT) and frame-based analysis of synesthetic metaphors in Polish. Using data from the corpus, the book provides ample empirical support for embodiment in metaphor and internal logic of mappings between frames. The study proposes new models of verbal synesthesia in the corpus and calls into question a universality of hierarchy of senses. This book should be of interest to researchers working within cognitive linguistics, in particular metaphor theory, frame semantics, corpus linguistics, and sensory science.

The Author

Magdalena Zawisławska holds a PhD in Linguistics and works at the Faculty of Polish Studies, University of Warsaw. Her main research interests are metaphor, lexical semantics, cognitive linguistics, and natural language processing (NLP). Her publications focus on metaphor in the language of science, lexical and contrastive semantics, and coreference.

Metaphor and Senses

STUDIES IN PHILOSOPHY
OF LANGUAGE AND LINGUISTICS

Edited by Piotr Stalmaszczyk

VOLUME 14

Advisory Board:

Emma Borg (University of Reading)

Manuel García-Carpintero (University of Barcelona)

Hans-Johann Glock (University of Zurich)

Paul Livingston (University of New Mexico)

Joanna Odrowąż-Sypniewska (University of Warsaw)

Maciej Witek (University of Szczecin)

Marián Zouhar (Slovak Academy of Sciences, Bratislava)



PETER LANG

Magdalena Zawisławska

Metaphor and Senses

The Synamet Corpus: A Polish Resource for
Synesthetic Metaphors



PETER LANG

Bibliographic Information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available online at <http://dnb.d-nb.de>.

Library of Congress Cataloging-in-Publication Data

A CIP catalog record for this book has been applied for at the Library of Congress.



The publication is funded by National Science Centre in Poland under the project no. UMO-2014/15/B/HS2/00182 titled: SYNAMET – the Microcorpus of Synaesthetic Metaphors. Towards a Formal Description and Efficient Methods of Analysis of Metaphors in Discourse.

Cover image: (en) "The five senses" / (da) "De fem sanser". Source: <https://www.europeana.eu/portal/record/2020903/KKSgb4385.html>. Ubekendt KKSgb4385. Statens Museum for Kunst. CC0 - <http://creativecommons.org/publicdomain/zero/1.0/>

Druck und Bindung: CPI books GmbH, Leck

ISSN 2363-7242

ISBN 978-3-631-79317-6 (Print)

E-ISBN 978-3-631-79330-5 (E-PDF)

E-ISBN 978-3-631-79331-2 (EPUB)

E-ISBN 978-3-631-79332-9 (MOBI)

DOI 10.3726/b15778

PETER LANG



Open Access: This work is licensed under a Creative Commons Attribution Non Commercial No Derivatives 4.0 unported license. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-nd/4.0/>

© Magdalena Zawisławska, 2019

Peter Lang – Berlin · Bern · Bruxelles · New York ·
Oxford · Warszawa · Wien

This publication has been peer reviewed.

www.peterlang.com

Contents

Introduction	9
1 Theoretical background	11
1.1 Conceptual theory of metaphor	11
1.2 Overview of frame semantics	15
1.2.1 Frames and domains	18
1.2.2 Frame semantics and CMT implementations	19
1.2.2.1 FrameNet	20
1.2.2.2 MetaNet	23
1.3 Theories of verbal synesthesia	25
1.3.1 Synesthesia and synesthetic metaphors	25
1.3.2 Models of verbal synesthesia	28
1.3.3 Typology of verbal synesthesia	31
2 Annotation methodology	33
2.1 Metaphor identification procedure in Synamet	33
2.2 Tools for annotation	39
2.3 Annotation procedure	43
2.3.1 Topic selection	43
2.3.2 Annotation of activators	44
2.3.3 Metaphorical unit annotation	44
2.3.4 Atypical metaphorical units annotation	49
2.3.4.1 Mixed metaphors	50
2.3.4.2 Indirect (entangled) metaphors	51
2.3.4.3 Narrative metaphors	53
2.3.5 Annotator inter-agreement	54

3 Composition of the Synamet corpus	57
4 Frames in Synamet	63
4.1 Frame ontology in Synamet	63
4.2 Statistics of perceptual frames in Synamet	67
4.3 Statistics of perceptual frames in categories	68
4.4 Statistics of non-perceptual frames in Synamet	74
4.5 Statistics of non-perceptual frames in categories	75
4.6 Statistics of frame elements in Synamet	77
4.6.1 Perceptual frame elements in Synamet	77
4.6.2 Non-perceptual frame elements in Synamet	79
4.6.3 Pairs of source-and-target frame elements in Synamet	81
4.6.4 Statistics of source frame elements in the categories with the highest rate of MUs	83
4.6.4.1 Perceptual source frame elements in the categories with the highest rate of MUs	85
4.6.4.2 Non-perceptual source frame elements in the categories with the highest rate of MUs	89
4.7 Verbal synesthesia from the perspective of frame semantics	91
4.7.1 Model of verbal synesthesia in Synamet	91
4.7.1.1 Models of verbal synesthesia in sub-corpora of Synamet	100
4.7.2 Embodiment in synesthetic metaphors	102
4.7.3 Frame structure in synesthetic metaphors	108
5 Activators in Synamet	111
5.1 Statistics of activators in Synamet	111
5.1.1 Frequency of lexemes evoking perceptual frames	112
5.1.2 Frequency of lexemes evoking non-perceptual frames	116
5.1.3 Frequency of lexical items evoking perceptual and non- perceptual frames	116
5.2 Grammar of metaphorical units	121

5.3 Semantic factors in metaphorical units' creation	129
5.3.1 Comparison of the adjectives <i>chłodny</i> 'cool' and <i>zimny</i> 'cold'	130
5.3.2 Comparison of the adjectives <i>mroczny</i> 'dark, obscure' and <i>ciemny</i> 'dark'	134
6 Metaphors in Synamet	141
6.1 Classification of metaphors in Synamet	141
6.2 Typical metaphors	142
6.2.1 Simple typical metaphors	143
6.2.2 Elaborated typical metaphors	143
6.3 Narrative metaphors	144
6.3.1 Definition of a narrative metaphor	146
6.3.2 Different types of narrative metaphors	150
6.4 Mixed metaphors	152
6.4.1 Simple mixed metaphors	153
6.4.2 Entangled mixed metaphors	154
6.5 Metaphorical triggers	156
6.5.1 Lexicalized metaphorical terms	158
6.5.2 Name of a subject	160
6.5.3 Situational and cultural factors	163
6.6 The function of metaphor	164
Conclusion	169
List of figures	173
List of tables	175
Bibliography	179
Index	199

Introduction

This monograph presents the main findings of the *Synamet – Microcorpus of Synesthetic Metaphors. Towards a Formal Description and Efficient Methods of Analysis of Metaphors in Discourse* research project.¹ The objectives of this research were to create a semantically and grammatically annotated corpus of Polish synesthetic metaphors and to examine features of various types of metaphors in naturalistic, non-prepared discourse. In order to properly study metaphor, which is a complex phenomenon, it was essential to start with a restricted research area. Synesthetic metaphors proved to be valuable material for research as they are frequent, diversified, and typical in all natural languages.

In this book, synesthetic metaphors are seen as a linguistic phenomenon not motivated by neurological synesthesia. Although synesthetic metaphors can be motivated by metonymy (Barcelona 2000), and metonymies and metaphors interpenetrate in texts, this book does not engage with the problem of metonymy. I assume that typical metaphor and typical metonymy are extreme points on a spectrum of various non-literal phenomena (Barnden 2016).

The overall structure of the study takes the form of six chapters. The first chapter analyzes the theoretical background of the Synamet project—Conceptual Metaphor Theory by Lakoff and Johnson (2008 [1980]), frame semantics by Fillmore (1985), and models of verbal synesthesia (e.g., Ullmann 1945, 1957; Viberg 1984; Williams 1976). Chapter two discusses the annotation method employed in the Synamet corpus and provides a description of the metaphor identification procedure, presents the annotation tools, and elaborates the procedure of annotation. The third chapter is concerned with the composition of the corpus. Chapter four provides an overview of the frame ontology in Synamet and the main statistics regarding source and target frames and their elements. Chapter five describes the statistics of activators (i.e., words that evoke frames) in the corpus and looks at the grammatical form of metaphors and the semantic factors in their creation. Chapter six focuses on different types of metaphors in Synamet and discusses functions of metaphors in the analyzed texts.

In this book, the following typographical conventions are employed: conceptual metaphors are indicated by SMALL CAPS, names of frames are in **UPPER CAPS AND BOLD**, and frame elements are in *UPPER CAPS AND ITALICS*.

1 Project no. UMO-2014/15/B/HS2/00182, financed by the Polish National Science Centre.

1 Theoretical background

The analytical approach adopted for Synamet draws on both frame semantics (Fillmore 1982) and Conceptual Metaphor Theory (CMT; formulated by Lakoff and Johnson (2008 [1980])). This chapter is concerned with the theoretical background of the Synamet project. The first section examines CMT. The second section deals with Fillmorean frame semantics. Since the main interest of the Synamet project was synesthetic metaphors, I provide a brief overview of different approaches to verbal synesthesia in the last section of this chapter.

1.1 Conceptual theory of metaphor

As a phenomenon involving both the conceptual system and language, metaphor has been a subject of interest for researchers in various disciplines, e.g., psychology, neurology, literary studies, linguistics, natural language processing, etc. Consequently, there is now a substantial body of scientific literature devoted to this topic. Since there are many conceptions of metaphor, and its range is constantly under debate, the term itself is vague. Theories of metaphor include the classical substitution and simile theory, reinterpretation theory (Searle 1993), interaction theory (Black 1993; Richards 1936), the theory of metaphor as predication (Arutjunowa 1981; Bogusławski 1971; Dobrzyńska 1984, 1994; Sedivy 1997; Wierzbicka 1971), the perspectival theory built on structural semantics' concept of lexical fields (Kittay 1987; Kittay and Lehrer 1981), the theory of metaphor as categorization (Glucksberg and Keysar 1993), conceptual metaphor theory (Lakoff and Johnson 2008 [1980]), and conceptual integration theory (Fauconnier and Turner 2002). Metaphor has been defined in various ways—as a substitution for names, a shortened simile, a predicate, an ad hoc categorization, mapping across conceptual domains, the blending of mental spaces, or a speech act. However, metaphor was made the center of attention only in the seminal work *Metaphors we live by* (Lakoff and Johnson 2008 [1980]). The authors posit that metaphor is the base of human conceptual system. They argue that:

Metaphor is for most people a device of the poetic imagination and the rhetorical flourish—a matter of extraordinary rather than ordinary language. Moreover, metaphor is typically viewed as characteristic of language alone, a matter of words rather than thought or action. For this reason, most people think they can get along perfectly well without metaphor. We have found, on the contrary, that metaphor is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual

system, in terms of which we both think and act, is fundamentally metaphorical in nature. (Lakoff and Johnson 2008 [1980]: 29)

CMT views metaphor as central to human understanding, allowing us to “comprehend abstract concepts and perform abstract reasoning” (Lakoff 1993: 244).

According to Lakoff and Johnson (2008 [1980]), metaphors can be described as understanding one domain of experience in terms of another. Therefore, metaphorization is a process involving entire domains of experience and not just isolated concepts. Lakoff (1993) defines metaphor as “mapping (in the mathematical sense) from a source domain [...] to a target domain [...]” (206–207). The mapping is a tightly structured set of correspondences. Lakoff (1993: 207) exemplifies this process using the metaphor *LOVE IS A JOURNEY*. The mapping in the metaphor is follows: lovers correspond to travelers, the love relationship corresponds to a vehicle, and the lovers’ common goals correspond to their destinations on the journey. Although mapping involves whole domains, it is in fact partial and asymmetrical. Only parts of a source domain are mapped onto a target—some aspects are highlighted and some are masked. The mapping is unidirectional—only from source to target and never the other way around.

The main CMT statements (Lakoff 1993, 2006, 2014) about the nature of metaphor are as following:

1. Metaphor is a primal conceptual phenomenon, not linguistic. It can be manifested not only in language forms, but also in gestures or visually. Metaphorical thought and reason arise independently of language.
2. Metaphor enables humans understand more abstract ideas (target domains) in terms of more concrete, physical, and better-structured source domains.
3. Metaphors are grounded in our most basic physical experiences, everyday experience and knowledge—that means that a metaphor is embodied. For example, metaphors such as *HAPPY IS UP*, *SAD IS DOWN*, *MORE IS UP*, *LESS IS DOWN*, and *AFFECTION IS WARMTH* arise from correlations between co-occurring embodied experiences.
4. Metaphorical mapping is characterized by the Invariance Principle: “Metaphorical mappings preserve the cognitive topology (that is, the image-schema structure) of the source domain, in a way consistent with the inherent structure of the target domain” (Lakoff 1993: 215).

One of the best-known examples of conceptual metaphors is *ARGUMENT IS WAR*. The metaphor manifests itself in expressions such as the following:

Your claims are indefensible.

He attacked every weak point in my argument. His criticisms were right on target.

I demolished his argument.

I've never won an argument with him.

You disagree? Okay, shoot!

If you use that strategy, he'll wipe you out. He shot down all of my arguments. (Lakoff and Johnson 2008 [1980]: 30)

Although CMT is widely used in metaphor analysis in various languages, it has been criticized for having many ambiguities (Gibbs 2017: 7). Stickles, David, Dodge and Hong 2016 (2016) note that CMT “has not been so far as rigorously formulated, unlike Frame Semantics and some versions of construction grammar” (167). CMT has been also criticized because of its reliance on researchers' intuitions in the analysis of metaphor (Gibbs 2017: 8). The thesis that metaphor is primarily a conceptual phenomenon was also undermined due to a lack of strong scientific evidence proving that conceptual metaphors are “psychologically real”. According to Jäkel (2003), defining a metaphor as a basic cognitive tool of reasoning and understanding results in blurring the distinction between literal and figurative senses.

Lakoff and Johnson (2008 [1980]) view metaphor as a mapping across domains (from the source domain onto the target domain). However, it has not been precisely stated what the term *conceptual domain* stands for, and how the domain's structure is supposed to be constructed. Sullivan (2013) notes:

Conceptual domains are a crucial concept in metaphor theory, yet there is no general agreement on how to define the type of domain used in metaphor. [...] Some attempts have been made to identify a conceptual, rather than a linguistic, basis for domains. Langacker [...] uses the term cognitive domain to refer to cognitive structures of any type, as long as they can be evoked using language; he asserts that “(a)ny cognitive structure – a novel conceptualization, an established concept, a perceptual experience, or an entire knowledge system – can function as the domain for a predication” [...]. (20–21)

The concept of metaphorical mapping is also problematic. Strack (2016) notes that the definition of mapping in CMT has never been precisely clarified. Lakoff (1993) proposes to understand mapping in a mathematical way. However, Strack (2016) points out that there are “certain aspects of metaphorical mapping that are fundamentally different from the definition observed in set theory” (3). In mathematics, the result of mapping should be “logically generated, static outcomes of a formula being applied to the original set.” In contrast, mapping in metaphors posits the preexistence of two conceptual domains in order to establish the initial correspondence. Strack (2016) writes:

For this reason, metaphorical understanding cannot strictly be seen as the logically determined consequence of a function (mapping) being applied to a set (conceptual

domain) thereby resulting in another set (conceptual domain); rather metaphorical understanding seems to occur as commensurable aspects of two pre-existing conceptual domains are linked thereby revealing latent structural similarities. (3)

According to Cameron and Deignan (2006), an analysis of discourse shows that metaphorical mappings are not as complete as cognitive theory suggests. Cameron and Deignan (2006) claim that “individual linguistic expressions have linguistic restrictions, as well as affective and pragmatic meanings that are not explained by the cognitive view of large scale systematic and stable mappings” (688).

The systematicity of conceptual metaphor is also doubtful. Pawelec (2005, 2006a) thinks that the explanation offered by Lakoff and Johnson is unclear and questionable. According to Pawelec, an individual metaphor can be the basis for subsequent metaphors that appear in a text as if they were analogical structures. Likewise, Cameron (2011) notes that in corpus studies on metaphors in discourse “undermines some of the claims of cognitive metaphor theory by showing that the systematicity is both less predictable and more specific than claimed” (26).

One of the criticisms of CMT pertains to the absence of reliable guidelines for “determining how different linguistic expressions are necessarily motivated by particular conceptual metaphors” (Gibbs 2017: 9). In CMT, a metaphor is a conceptual phenomenon, and it only manifests in language. Yet, we can discover conceptual metaphors only by analyzing their linguistic forms. Deignan (2008) notes that incongruence and points out that, “while on the one hand researchers in the cognitive tradition tend to downplay the importance of language, arguing that it is secondary to thought, they nonetheless depend on language to advance theory and knowledge” (151). Likewise, Hellsten (2002) posits that the distinction between conceptual metaphors and their linguistic manifestations is problematic since “it is often impossible to draw lines between the different levels of the same metaphor and thus to organize the specific metaphorical expressions into a conceptual metaphor” (20).

Applying CMT to naturalistic discourse analysis is also not an easy task (Gibbs 2017: 9), because real, not prepared texts are much more complex than isolated idiomatic expressions. Moreover, CMT tends to concentrate on conventionalized linguistic expressions. Wiben Jensen (2017) criticizes the tendency of CMT to analyze metaphors in isolation. Wiben Jensen (2017) thinks that “such a decontextualizing maneuver can only be carried out by reifying metaphor as a kind of object demarcated from its surroundings and constituted by internal structures—be they cognitive, neural, or purely linguistic” (262).

Since the goal of CMT is to provide a universal account of metaphor (Cameron 2011; Nerlich 2011; Zinken *et al.* 2008), it does not sufficiently account for the social and cultural factors in metaphor production (see Gibbs 2017: 9). Likewise, the analysis of semantic and pragmatic features of verbal metaphors is omitted in CMT.

The Invariance Principle proposed by Lakoff (1993) is also undermined. The main premise of this principle is that metaphorical mappings preserve a cognitive structure of the source, in a way consistent with the structure of the target domain. Nonetheless, CMT does not explain how it is possible to preserve the cognitive typology of source domain inasmuch as mapping is partial and asymmetrical. Another problem concerns target domains with no internal structure (like TIME)—in such cases, the mapping cannot be inherent to a target domain. It rather transfers a source structure onto a target (see Brugman 1990).

Lakoff (1993) explains that conventional mappings “are static correspondences, and are not, in themselves, algorithmic in nature” (245). Some scholars (Deignan 2005; Hellsten 2002) criticize CMT for failing to explain the creative potential of metaphors and for providing too static a view of metaphors.

In the Synamet project, two main assumptions of CMT were adopted: the hypothesis of the conceptual nature of metaphors (every verbal metaphor is a reflection of a conceptual mapping) and the schema of metaphorical transfer (from a source to a target domain). Furthermore, CMT was combined with frame semantics. Instead of the term *domain*, *frame* was used because, while the internal structure of domains is not fully clear, frames are described as ordered structures that contain categories (*slots*) and their values (*fillers*).

The next section provides a brief overview of the frame semantics adopted for annotation of metaphor annotation in the Synamet corpus. I analyze the relationship between the terms *frame* and *cognitive domain* and concentrate on the two most important implementations of frame semantics—FrameNet and MetaNet.

1.2 Overview of frame semantics

The concept of *frame* is used in various types of study, including anthropology, psychology, and cognitive science (see Tannen 1993). According to Nerlich and Clarke (2000: 141), the origins of the idea can be found in Kant’s philosophy, specifically in his conception of a *schema*—a rule by which a concept is linked to perception. Later, in psychology, Bartlett (1932) introduced schema theory. He proposed that people have mental schemata that represent generic knowledge about the world. Nerlich and Clarke (2000) believe that:

Kant's concept of schema influenced German Gestalt psychology, especially the distinction between figure and ground, and the chunking of knowledge representation. After having influenced field semantics at the beginning of the twentieth century, Gestalt psychology influenced frame theories in the cognitive sciences during the middle and end of this century. (141)

In social science studies, frames was mainly developed by Goffman (1974) who had described them as culturally determined definitions of reality that allow people to make sense of objects and events. The frame concept has also been used in Artificial Intelligence research. The core idea was introduced by Charniak (1972)—his system was based on the theoretical structure of rules called *demons*, whereby the main goal was to resolve the problem of children's story comprehension. Charniak's *demons* correspond roughly to *frames* in the theory developed later by Minsky (1974). Minsky (1974) defines frames as follows:

A frame is a data-structure for representing a stereotyped situation, like being in a certain kind of living room, or going to a child's birthday party. [...] We can think of a frame as a network of nodes and relations. The "top levels" of a frame are fixed, and represent things that are always true about the supposed situation. The lower levels have many terminals—"slots" that must be filled by specific instances or data. (1-2)

Shank and Abelson (1975, 1977) proposed a more dynamic view of human understanding and offered a theory of scripts. Scripts were defined as "structures that describe an appropriate sequence of events in a particular context. A script is made of slots and requirements about what can fill those slots" (Shank and Abelson 1975: 151). According to Shank and Abelson, scripts were stereotyped stories about well-known situations, for example going to a restaurant.

In cognitive linguistics, concepts synonymous with frames include image-schemas, idealized cognitive models, or mental spaces (Nerlich and Clarke 2000: 142). Nevertheless, the most recognized theory of frames in linguistics is Fillmore's (1985) semantics of understanding (*U-semantics*). The first time he used the term *frame* was in his prominent book *The Case for Case* (1968), when speaking about *case frames* that explain verb valency on a deep semantic level. Case frames characterize the relations between a predicate and its arguments' roles, such as AGENT, INSTRUMENT, OBJECTIVE, LOCATIVE, etc. Case grammar was strongly related to generative semantics, but later, Fillmore's (1982a, 1985) frame semantics was far distant from that theory. Fillmore (1982a) defines frames as a complex conceptual system:

By the word 'frame' I have in mind any system of concepts related in such a way that to understand any 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 the others are automatically made available. (111)

The best known of Fillmore's examples of a frame is time relations—in order to understand the word *weekend*, we have to activate a broader conceptual system that includes our cultural knowledge about time: that a year consists of twelve months, one month comprises four weeks, in each week, five days are workdays and two are free days. The word *weekend* can be understood only with respect to this background knowledge.

Fillmore's definition of *frame* changed during the evolution of his theory. In his early works (1977), he terminologically distinguished between *frames* and *scenes*. Fillmore (1977) understood a *frame* as a more linguistic phenomenon (collections of words and choices of grammatical rules or categories) in contrast to a *scene*, which has a cognitive dimension, e.g., visual scenes, standard scenarios, body image, “any kind of coherent segment, large or small, of human beliefs, actions, experiences, or imaginings” (63). According to Ziem (2014), Fillmore later (1982) redefined a *frame* as a cognitive structure—he argued that a *frame* was “a system of categories structured in accordance with some motivating context” (119). Fillmore defined the motivating context as a body of understanding, patterns of practices, or a history of social institutions. In his later work (Fillmore 1985), the term *scene* disappeared, and the frame became the only repository of semantic, encyclopedic, pragmatic, and contextual knowledge.

For an analysis of verbal metaphors in texts, the most important claim of U-semantics is that frames are evoked by linguistic expressions. As Fillmore (1982) writes: “[T]he lexical and grammatical material observable in the text ‘evokes’ the relevant frames in the mind of the interpreter by virtue of the fact that these lexical forms or these grammatical structures or categories exist as indices of these frames” (124).

Fillmore's theory describes differences between words' senses differently from the traditional semantic analysis. For example, the English nouns *ground* and *land* are synonyms, but according to Fillmore (1982), they evoke different semantic frames. The lexeme *land* denotes an area that is not underwater—in opposition to the lexeme *sea*. By contrast, the lexeme *ground* means the solid surface of earth—as opposed to the lexeme *air*. Therefore, we understand the two following sentences about a bird differently: it *spends its life on land* (i.e., not in water) or *spends its life on ground* (i.e., does not fly) (Fillmore 1982: 121).

Frames as a tool for discourse analysis were systematically tested in the FrameNet project. Another project that used frame semantics was MetaNet. The frames used there were not based directly on FrameNet's ontology, but have been

developed in the process of metaphor analysis (Stickles, David, Dodge and Hong 2016: 172). I elaborate frame semantics' implantation in more detail in the following sections of this chapter.

1.2.1 Frames and domains

Although frames and input cognitive domains originated from the bases of two different theories, several researchers have tried to combine those two tools in order to formalize metaphor analysis (Lakoff 2014; Stickles, David, Dodge and Hong 2016). The relationship between a *frame* and a *domain* has been described differently in the literature. It has been proposed that terms *domain* and *frame* are synonyms (Croft and Cruse 2004: 7–39). Moore (2006: 201, 2011: 761) argues that metaphors are mappings across frames rather than domains. Sullivan (2006, 2013) distinguishes frames and domains—Sullivan (2013) posits that “domains consist of schematic information available for metaphoric mapping. This information includes the structure of frames” (23). She notes that one domain is usually structured by multiple frames (Sullivan 2006: 388). Likewise, Dancyngier and Sweetser (2014: 23) define frames as “more elaborate concepts” than very broad and general domains, while domains are larger, multi-frame entities. Lakoff (2014) describes domains as “characterized by hierarchically structured frames. A frame is a complex schema, a mental structure that organizes knowledge. Each frame makes use of primitive concepts and may make use of conceptual metaphors” (2). Ziem's (2014) proposition is quite similar—he describes the relationship between a domain and a frame as follows:

The source and target domains form inference bases that are structured by frames in such a way that entrenched default values in the source domain occupy the corresponding slots in the target domain. Thus, a new conceptual structure emerges – that is, a metaphoric meaning. (324)

The “frame turn” in metaphor analysis arose from the lack of a precise definition of a domain. According to Dancyngier and Sweetser (2014):

What is useful about frames for our analysis is that we know something about their structure, whereas a *domain* is simply a term for a connected structure, of any kind. And structure is what gets mapped in metaphoric mapping, so the more we know about the structure of the source and the target, the more precisely we can define and motivate the mapping. [...] Frame thus provide a clearer way to identify the aspects of domain involved in metaphoric mapping. (19).

The same feature of frames is emphasized by Stickles, David, Dodge and Hong (2016: 171)—frames are structured entities that contain schematized

representations of world knowledge. Furthermore, they are taxonomically related to one another.

Since metaphor reflects a certain viewpoint, frames seem to be a very useful tool of analysis because they are “themselves viewpointed” (Dancyngier and Sweetser 2014: 20). Sullivan (2006: 398) notes that incorporating frames in CMT can help us to understand the logic behind the choice of particular lexemes in metaphorical expressions. Sullivan (2006) argues that “the frames evoked by lexical items’ non-metaphoric senses can determine which items are chosen to express a given conceptual metaphor” (387). Moore (2011: 761), in his work on temporal metaphors, observes that mappings are not across general domains (like TIME to SPACE) but rather between more specific concepts like *a place ahead of ego to a time in the future*. Therefore, mappings should be across conceptual frames that provide structures for specific concepts.

Another very important advantage of frames has thus far been insufficiently emphasized in the literature. Metaphors are not just conceptual structures that depend on culture and stereotypical naïve knowledge about the world—they are also (or above all) linguistic expressions. CMT and the concept of input domains do not offer a clear explanation for how a conceptual metaphor appears in its verbal form and how that particular form affects metaphor comprehension. Domains are postulated at a very general conceptual level and have no linguistic basis (Sullivan 2013). According to Sullivan (2018: 12), “CMT considers only conceptual structures, not linguistic ones”. By contrast, frame structure not only reflects the conceptual level, but is also strictly linked to language at both the grammatical and lexical levels (Stickles, David and Sweetser 2016: 319).

Although frames seem to be a useful tool for metaphor analysis, frame semantics is rarely incorporated into analysis from the perspective of CMT. According to Stickles, David, Dodge and Hong (2016):

At present, representation of relations between frames, such as inheritance of frame elements, is typically not incorporated into CMT analyses. Instead, there is an accepted general understanding in CMT that the source and target domains of metaphors are composed of frames or image schemas. (172)

The first project, which builds on both CMT and frame semantics, is MetaNet. I provide a brief overview of this project and FrameNet in the next section.

1.2.2 Frame semantics and CMT implementations

The most widely known projects in which frame semantics has been implemented are FrameNet and MetaNet, both developed at the International Computer

Science Institute in Berkeley. In this section, I introduce the main premises of those projects, along with their main advantages and shortcomings.

1.2.2.1 *FrameNet*

One of the largest frame databases is the Berkeley FrameNet. FrameNet aims to create an online lexical resource for English based on Fillmore’s frame semantics. FrameNet was launched in the mid-nineties and at the present moment contains 13,000 lexical units (LUs), 1,000 semantic frames, and 200,000 annotated sentences. A *semantic frame* is defined in FrameNet as “a script-like conceptual structure that describes a particular type of situation, object, or event along with its participants and props” (Ruppenhofer *et al.* 2016: 7). Each frame consists of frame elements (FEs) and can be evoked by LUs belonging to this frame, e.g., the **Sensation** frame includes the following core elements: BODY_PART, GROUND, PERCEIVER_PASSIVE, PERCEPT, and SOURCE. The frame’s non-core elements are: DEGREE, DESCRIPTOR, and TIME. The **Sensation** script looks like the following:

The FE SOURCE is used for the phenomenon that gives rise to the sensation in question. The FE PERCEPT is used for the characteristic quality of the sensation. In cases of veridical perception these are not typically distinguished from one another; we use the FE PERCEPT as the default in these cases. With some nouns in this frame it is possible to express the being who experiences the sensation, or the part of the body of such a being. We mark such expressions with the FEs PERCEIVER_PASSIVE and BODY_PART, respectively.

(<https://framenet.icsi.berkeley.edu/fndrupal/frameIndex>)

LUs that evoke the **Sensation** frame include *aroma, flavor, fragrance, image, noise, odor, sight, sound, taste*, etc. The sentences from FrameNet are annotated with FEs, as in the following examples: *This herb [SOURCE] gives off a **SMELL** of garlic [PERCEPT]; I [PERCEIVER_PASSIVE] have a tingling **FEELING** in my hands [BODY_PART].*

Core elements are defined as elements that form a set “in that the presence of any member of the set is sufficient to satisfy a semantic valence of the predicator” (Ruppenhofer *et al.* 2016: 25).

In FrameNet, the procedure of FE identification incorporates several stages: in the initial step, a group of synonymic lexemes is distinguished, and annotators then check to see if all of those LUs have the same number and type of elements and if they profile the same scene fragment. In the case of any difference, a new frame is created. For example, inchoative and causative verbs belong to different semantic frames. Likewise, lexemes with different information

about goal-achieving evoke separate frames, e.g., *work* and *develop*, or *shoot* and *decapitate*. Lexemes with different profiles of the same scene also belong to different semantic frames, e.g., verbs *buy*—**Commerce_buy** frame—and *sell*—**Commerce_sell** frame (Zawisławska 2010: 60).

Even though FrameNet is currently the most developed frame resource, it has some deficiencies, like an overly complex and confusing structure, overly general or overly detailed frames, and a valency-oriented approach (Zawisławska 2010).

Frames in FrameNet form have quite an elaborate and complicated structure. There are six frame-to-frame relations in the project: **Inheritance**, **Subframe**, **Causative_of**, **Inchoative_of**, **Perspective_on**, and **Using** (Ruppenhofer *et al.* 2016: 79). For example, the **Sensation** frame (the child) inherits from the **Perception** frame (the parent). The semantic relations in those frames must correspond to each other—the child frame may be more specific than the parent frame. In the **Subframe** relation, one frame includes several constituent frames, e.g., the **Criminal_process** frame has subframes **Arrest**, **Arraignment**, **Trial**, and **Sentencing**. **Causative_of** and **Inchoative_of** are defined as relations between stative frames and causative or inchoative frames. In the **Perspective_on** relation, frames comprise specific points-of-view of the same scene, e.g., the frames **Hiring** and **Get_a_job** profile different aspects of the parent frame **Employment_start**. The **Using** relation means that one frame presupposes another frame, e.g., the **Speed** frame needs the **Motion** frame as a background. This FrameNet structure results in the creation of non-lexical frames in order to participate in frame-to-frame relations.

The frame relations in FrameNet are quite unintuitive (Zawisławska 2010). Some of them lose important semantic connections between LUs that evoke different frames. Fillmore's (1977) well-known example is the *commercial event frame*, which includes the elements Buyer, Seller, Money, and Goods. According to Fillmore, the verb *buy* focuses on the actions of the Buyer with respect to the Goods, and the verb *sell* focuses on the actions of the Seller with respect to the Goods. However in FrameNet, one cannot see the direct semantic association between verbs *buy* and *sell* since they evoke two different frames: **Commerce_buy** and **Commerce_sell**. There is no direct relation between those two frames as both have a perspective on the **Commerce_goods_transfer** frame.

On the one hand, the frame definition adopted in FrameNet results in the creation of specific and detailed semantic frames containing small groups of LUs. For example, the **Actually_occurring_entity** frame is evoked by only one lexeme—*actual*. On the other hand, FrameNet also contains general frames with big sets of LUs. For example, dissimilar lexemes, such as *love.v*, *afraid.a*, *apprehensive.a*, *calm.a*, *despair.v*, *despise.v*, *dislike.v*, *envy.v*, *fulfilled.a*, *unfazed.a*,

belong to the same **Experiencer_subj** frame. Yet another questionable example involves the frames **Killing** and **Death**. The lexemes' attribution to those two frames is unclear—some lexical items, e.g., *fatal.a*, only evoke the **Killing** frame, even though they fit the **Death** frame equally well (Zawisławska 2010: 56–58).

Although FrameNet is based on frame semantics, it is in fact closer to Fillmore's primeval conceptions about case frames than to its successor U-semantics. Ziem (2014: 2) notes that the valency-oriented approach in FrameNet is only a part of the knowledge that is relevant for understanding an expression within the theory of semantics. According to Ziem, frames within the original U-semantics address not only the valence patterns of verbs, but also knowledge relevant to the meaning of all lexemes (not only predicates). Ziem (2014) writes:

Berkeley FrameNet project aims at building up a lexicographic database documenting valence patterns of Lexical Units (word-meaning pairs). The research scope of FrameNet is thus also much broader than the one of Case Grammar. At the same time the valency-oriented approach in FrameNet forms only a part of the knowledge relevant for understanding an expression as targeted with “frames of understanding”. (2)

According to Ruppenhofer *et al.* (2016: 7), frame-evoking words are typically verbs and FEs are their dependents. Evidently, FrameNet annotates nouns and adjectives that can also evoke frames (e.g., *reduction* in the **Cause_change_of_scalar** frame or *sleep* in the **Sleep** frame), but in most cases, nouns denoting artifacts or natural objects are just slot fillers in frames evoked by verbs, adjectives, or other nouns:

The lexical entry for a predicating word, derived from such annotations, identifies the frame which underlies a given meaning and species the ways in which FEs are realized in structures headed by the word. Many common nouns, such as artifacts like hat or tower, typically serve as dependents rather than clearly evoking their own frames. The main purpose of annotating such items is to identify the most common predicates that govern phrases headed by them, and thus to illustrate the ways in which these common nouns function as FEs within frames evoked by the governing predicates. We do recognize that artifact and natural kind nouns also have a minimal frame structure of their own. For example, artifacts often occur together with expressions indicating their subtype, the material of which they are made, their manner of production, and their purpose/use; these are de need as FEs in the frames for various types of artifacts. [...] However, the frames evoked by artifact and natural kind nouns rarely dominate the clauses in which they occur, and so are seldom selected as targets of annotation. (Ruppenhofer *et al.* 2016: 8)

This resolution is useful for an analysis concentrating on verbs, but it is not useful for discourse analysis inasmuch as nouns denote referents and verbs only indicate relations between them.

Another problem is that in FrameNet, lexical items with literal and metaphorical meanings are interpreted as separate lexemes evoking different frames (Sullivan 2018: 25). For example, there are 6 verbs *see* that evoke different frames: **Perception_experience**, **Grasp**, **Categorization**, **Touring**, **Reference_text**, **Causation**, **Eventive_affecting**, and **Condition_symptom_relation**. There are verbs that evoke *see* frames, which are also undoubtedly metaphorical: **Grasp** (together with such items as *apprehend* and *comprehend*), and **Categorization** (including *classify* and *categorize*). The main disadvantage is that there is no connection between the primary, basic frame (in this case **Perception_experience**) and secondary, metaphorical frames.

Despite these drawbacks, FrameNet’s method of annotation and its structure has been successfully adopted in many languages other than English: ASFALDA French FrameNet, Chinese FramaNNet, three German FrameNets, Spanish FrameNet, Japanese FrameNet, Swedish FrameNet, Korean FrameNet, and Polish FrameNet—RAMKI (Derwojedowa, Linde-Usiekiewicz and Zawisławska 2010).

1.2.2.2 MetaNet

MetaNet is a project where frame ontology was implemented and combined with CMT and Embodied Construction Grammar (ECG). The MetaNet repository contains over 650 pages of metaphors, and over 550 pages of semantic frames that act as source and target domains for metaphors. The repository is currently only for English, but there are plans to develop similar databases for other languages as well. The main advantage of MetaNet is that the repository represents not only conceptual metaphors, but also relationships between metaphors and frames, metaphor-to-metaphor relations, and metaphor-to-construction relations. Dodge (2018) emphasizes the fact that MetaNet has made some important additions and amendments to CMT. Among those are amendments are the “formalization of metaphor hierarchies, metaphor entailments, casual entailments, frame-to-metaphor relations, and the structurally integral part that constructional patterns in metaphor instantiation play” (Dodge 2018: 129).

The MetaNet repository contains semantic frames; each frame contains multiple roles, which are analogous to FrameNet’s FEs, and a set of LUs evoking those frames. LUs are identified by linguistic metaphorical analysis and any frame-evoking words are noted. For example, the **SMELL** frame in MetaNet can be evoked by LUs such as *smell*, *odor*, *fragrance*, *aroma*, *scent*, *bouquet*, *perfume*, *cologne*, *whiff*, or *incense*.

Frames in MetaNet are not based directly on FrameNet, but have been developed in the process of metaphor annotation and analysis (Stickles, David, Dodge and Hong 2016: 174). Frames in MetaNet are defined as follows:

Frames are conceptual gestalts: structured, schematic representations of different kinds of experiences, objects and events. Frame representations include roles and inferential structure. Individual frame entries have relations to other frames, thereby forming larger frame networks.²

The broad definition of frames in MetaNet includes both universal, basic knowledge about the world and cultural specific frames. According to Stickles, David, Dodge and Hong (2016), MetaNet

[...] views frames as coherent semantic and cognitive structures, formed from bodily interaction with the world. In the case of culturally-specific frames, this interaction includes one's sociocultural experiences. Frames are then proposed to be analyzed as either culturally-bound frames or image schemas to enable the validation of these universals and a cross-cultural comparison of frames. When a particular conceptual metaphor is validated crosslinguistically, it provides evidence both for the universal nature of the metaphor and for the image schemas that make up its source and target domains. (174)

Metaphors are defined in the MetaNet repository as mappings from a source frame to a target frame. The mapping is not only analyzed on the general frame-level, but also with respect to the role-to-role relations inside the input frames (Dodge 2018: 131). For example, the metaphor SEEING IS TOUCHING³ is described as a series of mapping between the source frame **Touching** and the target frame **Seeing**: eyes ← touch_bodypart; visual_ability ← sense_of_touch; seen_object ← touched_thing; visual_input ← tactile_input; or seer ← toucher.

In MetaNet, frames and metaphors form networks and are bonded by different types of relations. The set of frames that define broader conceptual domains are called *frame families* (Dodge 2018: 132). There are two main categories of frame relations in MetaNet—structure-defining relations, and non-hierarchical relations. The structure-defining relations include, for example, the *is a subcase of* relation, which indicates that a frame is a subcase of the more general frame, the *profiles part of* relation, which means that a frame profiles an element of a more complex scene, or the *is a subscale of* relation, which indicates that a frame profiles one end region of the more general frame's scale. For example, the frame

2 [https://metaphor.icsi.berkeley.edu/pub/en/index.php/Glossary:Frame_\(definition\)](https://metaphor.icsi.berkeley.edu/pub/en/index.php/Glossary:Frame_(definition)).

3 https://metaphor.icsi.berkeley.edu/pub/en/index.php/Metaphor:SEEING_IS_TOUCHING.

Touching is a subclass of the frame **Perception**. Non-hierarchical frame relations exist between frames related to the same, more general frame (for a more detail overview of frame relations in MetaNet—see Stickles, David, Dodge and Hong 2016).

Although metaphors in the MetaNet repository are combined with frame semantics, lexical items, and ECG, the analysis of actual linguistic metaphors is insufficient. A set of lexical items is only associated with frames. There is no information regarding how they were used in linguistic metaphors, since the metaphor page provides only one very simple example: e.g., the metaphor SEEING IS TOUCHING is illustrated with a short sentence *His eyes scoured the horizon*. Therefore, in MetaNet, the conceptual level still outweighs the linguistic level.

1.3 Theories of verbal synesthesia

This chapter begins with a brief overview of the different definitions of the terms *synesthesia* and *synesthetic metaphor*, followed by the most prominent models of synesthesia as proposed by Ullman (1957), Williams (1976), and Viberg (1984, 1993). Finally, I describe the typology of synesthetic metaphors as proposed by Judycka (1963) and Werning *et al.* (2006).

1.3.1 Synesthesia and synesthetic metaphors

The terms *synesthesia* and *synesthetic metaphor*, used in linguistics, psychology, and neuroscience, represent some critical differences in meaning. In neuroscience, the term *synesthesia* (from the Greek *syn* ‘together’ and *aisthesia* ‘perception’) is defined as an involuntary perceptual cross-modal association (Cytowic 2002; Marks 2011, 2017; Ramachandran & Hubbard 2001a, 2001b, 2003; Rogowska 2007). These associations involve a co-occurrence of impressions coming from different sense pathways, e.g. hearing tones when looking at colors, or vice versa (Rogowska 2007: 18). According to some psychologists (Cytowic 2002; Marks 1982b, 1996; Rogowska 2007), specific cross-modalities are unique to synesthetes and this neurological condition is rare, idiosyncratic, and permanent (for a more detailed overview of various synesthesia see Auvray and Farina 2017).

In linguistics, the term *synesthetic metaphor* refers to a special type of figurative expression. Butler (1978: 115) described this metaphor as using one name for several types of sensory perception. Strik Lievers (2015) proposed the following definition:

The term 'synaesthesia' in linguistics commonly refers to a metaphorical process of transfer from one sensory modality (source) to another (target): a perceptual experience related to one sense is described through lexical means typically associated with a different sense. (69–70)

Synesthetic metaphors have been a valuable and interesting subject for linguistic, literary, and anthropological studies. These metaphors seem to be quite universal in all natural languages and are therefore pervasive across different cultures (Classens 1993; Yu 2015). Moreover, synesthetic metaphors are quite commonly used in everyday language, with widespread appearances in advertising and marketing-related texts (Holz 2007; Ronga 2016).

Some scholars (Rogowska 2007; Striek Lievers 2015, 2017; Winter 2016b) considered perceptual synesthesia and synesthetic metaphor to be two utterly different and unrelated phenomena. They argued that perceptual synesthesia is quite a rare condition, experienced by only a minority of individuals. In their opinion, verbal synesthesia should be considered metaphorical since it extends the meaning of an utterance from one sensory modality to another through the use of an analogy (Williams 1976).

According to Rogowska (2007) and Ronga (2016), perceptual synesthesia and synesthetic metaphors differ in many aspects. Synesthesia is a psychological phenomenon uniting simple perceptual sensations on a very basic level of information processing, whereas synesthetic metaphors connect much more complex mental images. While synesthesia is an involuntary and automatic experience (synesthetic perceptions are triggered by sensory stimulation and cannot usually be controlled by synesthetes), synesthetic metaphors are intentional and consciously created. Moreover, neurological synesthetic percepts do not change over time and are independent of various outside factors, whereas synesthetic metaphors may evolve and change significantly. Linguistic synesthesia is evidently dependent on cultures, emotions, contexts, and knowledge of the world. Synesthetes are unable to explain why they have such specific cross-modal associations while authors of synesthetic metaphors may be aware of a metaphor's origin.

Winter (2016: 141) emphasized the need to create a sharp distinction between those two phenomena stating, "synesthesia is a perceptual phenomenon; synesthetic metaphor a linguistic one". In his view, even the term *synesthetic metaphor* itself is misleading. He suggested using *cross-modality* as "a theoretically more neutral term to apply to these linguistic constructions" (Winter 2016: 141).

On the other hand, Striek Lievers (2017: 97), defining metaphor according to Prandi (2012, 2017) as conceptual conflict, believed that verbal synesthesia is metaphorical, since it features "a conflict between concepts that cannot be connected

via a consistent relation. It may be distinguished from other metaphors because the conflicting concepts are both sensory, referring to two conceptually separate senses". She.

In contrast, some researchers were adamant that linguistic synesthetic metaphors are reflections of neurological synesthesia (Cacciari 2008; Judycka 1963; Marks 1990, 1996; Popova 2005; Ramachandran & Hubbard 2001a, 2001b). The notion that synesthesia (perception) and cross-modal metaphors (language) both depend on shared perceptual or conceptual features, sometimes on the same set of these features, has been put forward by Karwoski, Odbert and Osgood (1942). As Cacciari (2008) hypothesized,

[...] most perceptually based metaphorical expressions (e.g. *a cold silence, a stony flavor*) are motivated and rooted in the structure of perceptual experiences and sensory system. Metaphors do not reflect an abstract-amodal combination of word senses, but rather constitute the linguistic expression of the neural endowment necessary for the treating sensory information. (426).

More persuasive support for this concept was offered by Marks and Mulvenna (2013):

Synesthesia, metaphor, and creativity are associated, albeit in complex ways, and cross-modal correspondences often lie at the heart of the interrelations. [...] Cross-modal correspondences pervade both perception and language. [...] First, cross-modal correspondences act like primitive metaphors, serving as ingredients to both cross-modal synesthesia in perception and metaphor in language (metaphor being our 'model system' for creativity). Second, both the production and interpretation of metaphor are open-ended, thereby revealing their links to creativity, especially creative cognition. Contrary to the hypothesis that metaphors consist of specific, overlapping or common attributes in different domains and therefore represent fixed resemblances in meanings, metaphors serve to proliferate resemblances. (29–30).

While perceptual synesthesia is quite uncommon, systematic cross-modal associations are typical even for nonsynesthetes. Marks (1982a, 1982b, 1996, 2017) observed a regular correlation between loudness of sounds and brightness, pitch of sounds and brightness, and size and pitch in both non-synesthetic children and adults. Therefore, he put forward two different types of psychological synesthesia: strong and weak. *Strong synesthesia* was defined as a neurological process which causes intermodal percepts, while *weak synesthesia* included *synesthetic tendencies* and may be experienced by the vast majority of people (Marks 1996: 42–43). Marks (2017) elaborated as follows:

Although nonsynesthetic individuals do not share the vivid experiences of synesthetes, nonsynesthetes have linguistic access to the same cross-modal similarities, several of

which may arise directly from sensory coding mechanism. These similarities express themselves initially in perception, from which they become available, through development, to more abstract representations in language (21)

In the Synamet project, a sharp distinction between psychological synesthesia and the synesthetic metaphor was maintained. This supported the traditional viewpoint considering expressions evoking two different perceptual frames to be synesthetic metaphors.

1.3.2 Models of verbal synesthesia

Some linguists (Shen 1997; Tsur 1992; Ullman 1957; Williams 1976; Yu 2003) believed that the mapping of synesthetic metaphors from their source to their target domains takes place in one direction — from the so-called *lower* (e.g. touch, taste, smell) to the *higher* (e.g. hearing and sight) senses (cf. Strik Lievers 2015: 70). Moreover, those scholars argued that this hierarchical model of senses is universal for all languages.

In his seminal work, Ullmann (1957) defined *synesthesia* as “a special kind of name-transfer through association between the senses” (277). He distinguished six modalities: TOUCH, HEAT⁴, TASTE, SCENT, SOUND, and SIGHT⁵. After analyzing a large corpus of 19th century English, French, and Hungarian poetry, Ullmann observed that transfers in synesthetic metaphors are almost invariably made from the lower sensory modalities (touch and taste) to the higher ones (sound and vision). He pointed out that “transfers tend to mount from the lower to the higher reaches of the sensorium, from the less differentiated sensations to the more differentiated ones, and not vice versa” (Ullmann 1957: 280). He argued that the ultimate source is touch and the predominant target is sound:

From the very outset, the acoustic field emerged as the main recipient, distinctly superior to the visual domain which would have been just as eligible from the hierarchical point of view; it might even have been in advantageous position in that all transfers to sight are necessarily upwards ones, whereas sound can also be strengthened by downward metaphors from sight. (283)

-
- 4 Ullmann (1957: 278) thinks that heat should be separated from touch as it possesses “a certain measure of psychical autonomy”.
 - 5 Some scholars (Tsur 1992; Strik Lievers 2015; Winter 2016) describe this hierarchical organization of the human sensorium as being Ullmann’s model of synesthesia, but this assumption is wrong. Ullmann never described this as the actual hierarchy of verbal synesthesia in the analyzed texts. Quite the opposite, he noticed that the ultimate target is hearing, not vision.

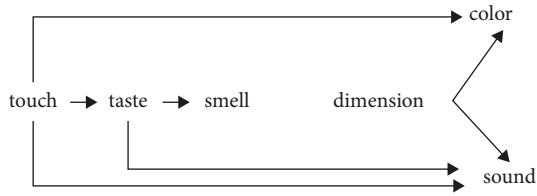


Fig. 1: Williams' (1976: 463) model of verbal synesthesia.

Ullmann argued that since touch and heat, as well as smell and taste, are very closely associated they should be amalgamated. Therefore, the model of synesthesia proposed by Ullmann is as follows: TOUCH/HEAT→TASTE/SCENT→SIGHT→SOUND. Williams' (1976) study of English adjectives referring to sensory experiences, Shen and Cohen's (1998) experiment based on a corpus of English and Hebrew poetry, and Duang and Gao (2014) analysis of synesthetic metaphors in Chinese and English all seemed to confirm Ullmann, finding a regular pattern behind the creation of synesthetic metaphors in natural languages. It is also important to note that according to Ullmann, synesthesia does not include the transfers of physical sensations to mental states (i.e., *sweet temper*, *warm person*, *sharp mind* are not examples of synesthesia).

Williams (1976) examined regularities in the diachronic semantic changes of English adjectives referring to sensory experiences. He excluded sensory words that have not resulted in metaphors (e.g., damp, wet, short, long) and morphologically complex and derived words (e.g., muddy, noisy, lemony, burning). His model of verbal synesthesia was more complex than Ullmann's (see Fig. 1).

Williams' model supported the main concepts of Ullmann's linear hierarchy, citing tactile perception as the most typical source of metaphors while auditory perception is the ultimate target. Williams pointed out that taste words could be transferred to the domain of smell (e.g. sour smell) and sound (e.g., sweet music) but not back to tactile experiences or forward to dimensions or colors. He argued that names of perception could be shifted "from the physiologically least differentiating, most evolutionary primitive sensory modalities to the most differentiating, most advanced, but not vice versa" (Williams 1976: 464–465). Moreover, Williams claimed that semantic changes observed in English and Japanese are so regular and so inclusive that they can be classified as part of a universal law of semantic change for all natural languages.

Classen (1993), in her anthropological study observing different cultures and languages, proposed the following direction for cross-modality transfers in

synesthetic metaphors: HEARING → VISION → SMELL → TASTE → TOUCH. In this model, the transfer of senses is shown top-down—from the predominant recipient (hearing) to the ultimate source (touch.) Therefore, her observations also supported Ullmann's findings.

Likewise, Shen and Cohen (1998) argued that the lower senses (touch and taste) were more accessible than higher ones (sound and vision) because they involved a less-mediated experience of perception. That is why a phrase like *sweet silence* is preferred over *silent sweetness*.

The model of verbal synesthesia by Day (1996) was quite similar to those proposed earlier. He tried to determine how synesthetic metaphors transfers are used in English through a corpus analysis. He analyzed data from *The World Library's Greatest Books Collection*, *The Oxford Text Archive*, and *Project Gutenberg*. Day (1996: 8) proposed the following model of verbal synesthesia: HEARING → VISION → SMELL → TEMPERATURE → TASTE → TOUCH. This hierarchy should be read like Classens' model, with touch as the ultimate source and hearing as the ultimate target.

Duang and Gao (2014) examined synesthetic metaphors with olfactory and gustatory source domains in Chinese and English. They concentrated on such problems as hierarchical distribution among sensory modes and the transfer frequencies of sensory tendencies. Their analysis essentially proved Ullmann's claim about the universality of lower-to-higher modality transfers. One exception were transfers between the two highest modalities: vision and sound, which were equally likely to serve as targets or sources.

However, a quite different model of verbal synesthesia was proposed by Viberg (1984, 1993). He studied verbs of perception in 50 different languages. In his hierarchical sense model (Viberg 1993: 374), the primary source was sight and the most typical targets were taste and smell: SEE → HEAR → FEEL → TASTE, SMELL. He claimed that if a language had only one verb of perception, its basic meaning would be 'see'; if it had two, the basic senses would be 'see' and 'hear', etc. One can clearly see that Viberg's model of verbal synesthesia conflicted with Ullmann's hierarchy of senses. Strik Lievers (2015) claimed that even though Ullmann's and Viberg's models are quite contradictory, "they relate to the same extra-linguistic factors. Underlying both hierarchies is the dominance, in human perception, of sight (and secondarily hearing) over the other sensory modalities" (86).

Synesthetic metaphors in Polish were mainly studied from a diachronic point of view by Judycka (1963). Other authors also undertook fragmentary studies of this topic, such as Mitrenga's study (2014) of taste or Badyda's monograph (2013) about smell. Synesthetic metaphors within various types of discourse have been

the subject of several papers (Biłas-Pleszak 2007; Najdecka 2013; Prochowicz 2013; Rosińska 2005; Termińska 1992; Witucka 1998). Yet, to date no research has been entirely devoted to analyzing synesthetic metaphors involving various perceptual domains in contemporary Polish.

The Synamet project based a model of verbal synesthesia on frequencies of source frames within analyzed synesthetic metaphors. A more detailed analysis of the hierarchy of senses in this corpus is provided in Chapter 4.7, *Verbal synesthesia from the perspective of frame semantics*.

1.3.3 Typology of verbal synesthesia

The synesthetic metaphor category in literature embraces various subtypes. Judycka (1963: 59–60) based her study on the taxonomy proposed by Jaensch (1929), who distinguished between *synesthesia in the narrow sense* (expressions denoting only the perceptual sphere) and *synesthesia in the broad sense* (emotional synesthesia, such as *dark despair*, conceptual symbols, and a so-called complex synesthesia). Judycka (1963) made also a clear distinction between the *word synesthesia* which was etymological and entrenched (e.g. *lęk* ‘fear’, Proto-Slavic **lęk-ŏ* ‘I bend’), and *phraseological synesthesia* (e.g. *sweet sound*). She also distinguished between *simple* and *complex synesthesia*, the latter consisting of a merger of sensations coming from different perceptual domains, e.g. *thin/lean, fat/greasy*.

According to Werning *et al.* (2006), a metaphor is synesthetic only when one of the domains pertains to perception (visual, auditory, olfactory, tactile, or gustatory). If both the source and the target domains are perceptual, it is *a strong synesthetic metaphor*. If only the source domain evokes perception, it is *a weak synesthetic metaphor*. For example, the phrase *słodki zapach* ‘sweet smell’ (TASTE → SMELL) is a strong synesthetic metaphor, while the expression *słodkie wspomnienia* ‘sweet memories’ (TASTE → PERSON) is a weak synesthetic metaphor.

In the Synamet project, the broadest possible sense of the term *synesthetic metaphor* was used, in order to collect the most varied material possible. Therefore, both strong and weak metaphors, as defined by Werning *et al.* (2006), were annotated. Moreover, the project considered synesthetic metaphors with perceptual target frames and non-perceptual source frames, e.g. *sandałowa poducha* ‘sandalwood pillow’ (HOME → SMELL), *różana baza* ‘rose base’ (ARCHITECTURE → SMELL), *wina, które zestarzały się ze stylem* ‘wines which grow old with style’ (PERSON → TASTE). However, in the annotation procedure Judycka’s concept of *word synesthesia* was excluded, since expressions of this type require much deeper etymological analysis and as such are not transparent to an average native speaker.

2 Annotation methodology

This chapter provides an overview of the process of identifying and annotating synesthetic metaphors in the Synamet corpus. The first section deals with the metaphor identification procedure, the second section describes the tool used for annotation, and the final section concentrates on metaphor annotation with respect to atypical metaphor annotation.

Detailed instructions for the annotators were prepared, and the analysis procedure was facilitated by a dedicated computer application called the Annotation Tool of Synesthetic Metaphor (ATOS).⁶ The metaphor annotation procedure in SYNAMET included several steps:

1. Definition of the referent (topic).
2. Extraction of a metaphorical unit (MU).
3. Classification of atypical MUs (i.e., mixed, entangled, or narrative)
4. Description of the metaphorical phrase type.
5. Selection of the metaphor type: strong or weak (see Werning *et al.* 2006).
6. Selection of metaphor category: simple or complex synesthesia.
7. Definition of the semantic head of the phrase.
8. Selection of the source frame.
9. Selection of the source frame element.
10. Grammatical description of the word or words evoking the source frame.
11. Selection of the target frame.
12. Selection of the target frame element.
13. Grammatical description of the word or words evoking the target frame.

Annotators could also indicate borderline metaphors (there was a *Magazyn* ‘store’ catalogue for any questionable phenomena in ATOS).

The next section provides a detailed analysis of metaphor identification procedures applied to the Synamet corpus.

2.1 Metaphor identification procedure in Synamet

In Synamet, annotators analyzed whole, authentic, and not prepared blog entries. It was essential to go back to real, naturalistic discourse where all

6 ATOS is a tool designed specifically for the project by the company Lingventa <http://www.lingventa.pl/index.html>.

kinds of metaphorical expressions occur—from highly lexicalized metaphorical terms or idioms to new, creative metaphors. According to Wiben Jensen (2017):

When studying metaphoricity in discourse, we need to do more than just pick out potentially metaphoric expressions and then analyze them in isolation in terms of conceptual mappings as traditionally done in Conceptual Metaphor Theory (CMT). Such a decontextualizing maneuver can only be carried out by reifying metaphor as a kind of object demarcated from its surroundings and constituted by internal structures – be they cognitive, neural, or purely linguistic. It is vital, however, to attempt to capture metaphoricity in its natural surroundings. (262)

Wiben Jensen advises the redefinition of the object of study to studying naturalistic data, rather than isolated words or single utterances. In his view, metaphor is a phenomenon arising from constant change and the reorganization of the system. Therefore, it is necessary for a “shift of focus from the fixed concept of metaphor to the more fluid notion of metaphoricity” (Wiben Jensen 2017: 275).

Although the analysis of naturalistic data enables the collection of various and more creative metaphors, the biggest challenge was establishing a procedure of metaphor recognition in non-prepared texts. A metaphor is a continuum ranging from the most typical phenomena, through more peripheral ones, up to borderline cases residing on the border of literal and figurative meanings. Cameron and Maslen’s (2010: 102) proposal served as the preliminary assumption. They suggest that what should be identified is potentially metaphorical words, which does not entail that the words must be regarded as such by all language users. It enabled annotators of the Synamet corpus to take into account both entrenched and novel, creative metaphors.

There are several different procedures for recognizing metaphors in discourse. We have at our disposal the *met** system (Fass 1991), a procedure called metaphorical pattern analysis (MPA) proposed by Stefanowitsch (2006: 65–70), or Krishnakumaran and Zhu’s (2007) system, which is based on the WordNet ontology, the MIP system (Pragglejaz 2007; Semino 2008), the MIPVU system (Steen *et al.* 2010), as well as metaphor identification using noun and verb clustering (Shutova, Lin and Korhonen 2010). Stefanowitsch (2006) sums up the strategies of metaphor recognition, which include manual identification of figurative language, searching for particular lexical items from the source or target domains, searching for sentences containing lexical items from both the source and target domains, searching for metaphors based on special *markers of metaphor*, and extracting metaphors from corpora annotated for semantic fields or domains.

All of these systems have disadvantages. According to Jang *et al.* (2017: 320), the main problem with the computational approach to metaphor identification is that it is largely focused on metaphor detection within individual sentences. Therefore, the detection of metaphors in naturalistic discourse remains an open problem. Moreover, most of the above-mentioned procedures concentrate on searching for metaphors in already existing corpora (e.g., MPA). The results depend on already adopted assumptions, i.e., one gets what one anticipates. Stickles, David, Dodge and Hong (2016) write:

One main issue is that CMT relies too heavily on the intuitions of the individual linguist at work and is insufficiently data-driven. Because metaphor identification typically involves a top-down analysis model relying on the analyst to intuitively recognize metaphoric language, it can be perceived as a circular reasoning process by which analysts only identify metaphors they were already looking for or only those metaphors of which they are already aware. Furthermore, because most metaphor analysis is performed by individuals or small working groups, data analysis must be relatively small-scale and limited to the amount of text a person is capable of parsing. In turn, this leads to criticisms of a lack of scientific rigor and objectivity, as well as the inability to replicate results; using external sources rather than purely relying on the analyst's intuition can increase agreement between analysts and improve consistency. (167–168)

The most widely known metaphor recognition procedure is the Metaphor Identification Procedure Vrije Universiteit (MIPVU; Steen *et al.* 2010), which constitutes a modified and elaborated version of MIP, as proposed by the Pragglejaz group (Pragglejaz 2007; Semino 2008: 11–12). MIPVU was successfully applied to text analysis of the Amsterdam Metaphor Corpus. For the purposes of the Synamet project, a modified version of MIP and MIPVU was adopted. MIP is comprised of the following stages: 1) reading the entire text in order to establish its general meaning; 2) determining the LUs used in the text; and 3) determining the meanings of the LUs. The procedure requires the meaning of every lexeme to be determined in the given context, i.e., how the word “applies to an entity, relation, or attribute in the situation evoked by the text” (Pragglejaz 2007: 3). The next step consists of determining whether each of the words has a different, more basic sense, activated in other contexts. According to the authors, more basic meanings of a lexeme include concrete, physical meanings, meanings evoking bodily action, and more precise, clear meanings. The MIPVU procedure (Steen *et al.* 2010) has been enriched by adding the following principles: word class boundaries may not be crossed for LUs represented by the same shape (i.e., the meaning of a verb cannot be compared to the meaning of a noun), and word etymology is rarely considered.

The main change in MIP and MIPVU procedures adopted for the purposes of Synamet was the identification of the referent (*topic*) of an analyzed text. According to classical logical semantics, a lexical unit has two aspects of meaning: *Bedeutung* and *Sinn* (Frege 1892), *denotation* and *connotation* (Mill 1875), *denotation* and *meaning* (Russell 1905), *extension* and *intension* (Carnap 1947), or *reference* and *sense* (Black 1949). Reference is a relation to an extralinguistic being (a referent), while sense is a relation to other signs of the language system. Croft (1991: 52) posits that reference serves to “get the hearer to identify an entity as what is being talked about”; predication, by contrast, deals with “what the speaker intends to say about what he is talking about (the referent)”.

Padučeva (1992: 12) notes that reference applies not to words but to utterances—i.e., the usage of words in text. Therefore, a lexeme’s denotation is not a reference, but rather indicates a set of potential referents. This claim supports Tsur (2007), who writes as follows:

A word’s meaning is a relationship between a phonological cluster and a concept. As long as words (and syntax) are language, meaning is language too. Now meaning should be kept apart from reference. Consider, for instance, the following two phrases: “The President who plays the saxophone”, and “The President who is said to have had an affair with Monika Lewinsky”. These two phrases have very different meanings; the realization of this requires linguistic knowledge. But the two phrases may have the same referent; the realization of this requires the realization of a relationship between language and extra-linguistics reality. (246–247)

The definition of an extralinguistic world to which an utterance refers is yet another problem concerning theories of reference. In the classical view, it is the real world. Kunz (2010: 31) writes that reference applies to a world of discourse. Therefore, we can talk about objects that do not exist in the real world (like unicorns), abstract ideas, the distant past, or the future (see Zawisławska 2015: 3–12). Likewise, Jackendoff (1983) excludes reference to the real world:

We must take issue with the naïve position that the information conveyed by language is about the real world. We have conscious access only to the projected world – the world as unconsciously organized by the mind; and we can talk about things only insofar as they have achieved mental representation through these processes of organisation. Hence the information conveyed by language must be about the projected world. (29)

Ziem (2014) proposes a compromise for this problem—he notes that “reference acts already involve conceptual integration processes; referentialization is not possible without simultaneous conceptualization of the reference object” (327). He also emphasizes the fundamental role of frames in reference. According to

Ziem (2014), frames represent encyclopedic knowledge, which can be understood as sets of propositions—an evoked frame corresponds to the referential content of a proposition, and a referent of the predication is a filler or default value of the frame's slot:

A linguistic expression refers to a cognitive unit by evoking a frame, which then opens a potential reference area [...]. Evocation of a frame corresponds to the cognitive act of referentialization. Frames as units in the projected world serve as projection areas for referentiality. [...] In any case, referentialization is an act that creates order by co-activating the default values of the evoked frame in its very performance. Using the word unicorn to refer to a particular imagined object presupposes, for example, actualized assumption about the external properties of unicorn. (251–252)

On the other hand, Wróblewski (1998) proposes two elements of a metaphorical expression: the *topic* (i.e., the element that is construed within a realistic convention) and the *modifier* (i.e., the element that is construed within a metaphorical convention). Therefore, a referent (a *topic* in Wróblewski's terms) exists in a realistic dimension, while a predicate (a *modifier*) is an element of an expression that turns it into a metaphor. In frame and CMT terminology, a frame that is evoked by a phrase denoting a referent is a target and a frame that is evoked by a predicative phrase is a source.

Therefore, in the Synamet project, annotators had to start the metaphor identification procedure by establishing referents in an analyzed text. For example, in the fragment *tylę innych burgundów z lat 90-tych cierpi na sklerozę i haluksy* 'so many Burgundies from the 1990s suffer from sclerosis and bunions' the referent (*topic*) is wines—Burgundies. In the next step, annotators had to decide if the expressions referring to the topic were synesthetic metaphors, which were called *metaphorical units* (MUs) in Synamet. A MU was understood as a single phrase, sentence, or text fragment, where two different frames are activated and at least one of them was perceptual. For establishing literal and metaphorical senses of LUs, annotators used *Uniwersalny słownik języka polskiego* 'Universal Dictionary of Polish Language' (USJP; Dubisz 2003). In the above example, in the phrase *tylę innych burgundów z lat 90-tych* 'so many Burgundies from the 1990s', the referent evokes the **TASTE** frame and the **OBJECT OF PERCEPTION** element (thus the evoked frame is perceptual). The predicate is the phrase *cierpi na sklerozę i haluksy* 'suffer from sclerosis and bunions'. In the dictionary (Dubisz 2003), the literal sense of the verb *cierpieć* 'to suffer' is 'to suffer physically or mentally, or to undergo hardship', and it requires a personal noun as a subject in its syntactic schema. Therefore, the verb evokes a frame **PERSON**, and its element **ILLNESS** is activated by the names of illnesses typical of humans (*sclerosis*,

bunions). Therefore, the analysis proved that the example is both metaphorical and synesthetic.

The referents are typically expressed by nominal phrases (Topolińska 1984). They can be proper names or common nouns, see (1) and (2)⁷:

- (1) Atom Heart to hard rock szyty prawdziwą bluesową miarą.
'Atom Heart is hard rock tailored with a true blues measuring stick.'
- (2) Wina pochodzące stamtąd mają bardzo mineralny, smukły charakter.
'Wines originating there have a very mineraly, slim character.'

Sometimes the referent identification required the annotators to have more specialist knowledge. For example, in (3) the annotator had to know what *baga* refers to in order to identify the referent:

- (3) Mówią, że бага na piasku rodzi nieprzystępne potwory, jednak ręka Luisa Pato oswoiła bestię.
'One says that бага on sands gives birth too hard to get monsters, though Luis Pato's hand had tamed the beast.'

Baga in Portuguese means literally 'berry', and it is one of the highest yielding grape varieties, cultivated mainly in the Bairrada region of Portugal. The variety is unpredictable and requires laborious and careful cultivation. Knowledge about *baga* is essential for establishing the reference of phrases *potwór* 'monsters' and *bestia* 'beast'—in this example they refer to red wines produced from that grape variety.

According to Cameron (2011: 37), a metaphor topic is not often found in discourse (especially in spontaneous speech), while vehicle terms tend to be used on their own. This situation occurs in the Synamet corpus quite often due to the morphology and syntax of Polish. Words that denote referents can easily be omitted in a sentence: in example (4), the referent is a wine and in example (5), the referent is a perfume.

- (4) Daje się wyczuć połączenie owoców z aksamitnymi nutami amerykańskiego i francuskiego dębu.
'A mixture of fruit with velvety notes of American and French oak is detectable.'
- (5) Otwiera się głośno, przykurzonym aromatem cytrusów.
'[It] opens loudly with a dusty aroma of citrus fruit.'

7 All examples are from the Synamet corpus. For the examples longer than 3 lines, the web addresses of the source blogs are indicated.

Very often a referent is indicated only by context (sometimes very broad context). One has to understand the broad context in order to establish that in (6), *konfiturze* ‘preserves’ refers to the perfume *Rose Aramis* by Calligraphy:

- (6) Ale co w tej konfiturze? Grube i ciężkie płatki róż przede wszystkim, a z nimi miodowy wiciokrzew. Do tego szczypta szafranu, szczypta oregano i balsamiczna, kojąca mirra.
(<https://pachnacehistorie.pl/2015/10/22/aramis-perfume-calligraphy-rose/>)
‘But what do these preserves contain? First of all, some thick and heavy rose petals together with honeysuckle. Besides, a pinch of saffron, a pinch of oregano, and balsamic, soothing myrrh.’

Another example (7) at the first sight looks like a simple description of an operatic aria:

- (7) Jaka szkoda, że ta przecudnej urody aria jest tak lakoniczna, dyskretna, ulotna i delikatna – bo aż by się chciało zatracić i przepaść z kretesem w tym zniewalającym brzmieniu...
(<https://perfumomania.wordpress.com/2015/10/26/acqua-di-parma-colonia-intensa-czyli-kwintesencja-ulotnej-doskonalosci/>)
‘It’s too bad that this aria of lovely beauty is so laconic, discreet, light, elusive and delicate—because one would like to become completely engrossed and disappear in this captivating sound.’

One can even find synesthetic metaphors in this fragment (e.g., *aria is light*, **MULTIMODAL PERCEPTION**→**HEARING**). The problem is that the topic (referent) of this fragment is the perfume *Colonia Intensa* by Aqua di Parma. Therefore, all epithets refer to the **SMELL** frame (**PERFUME IS AN ARIA**) and not to the **HEARING** frame.

2.2 Tools for annotation

Texts excerpted (1414 entries from blogs) were pre-analyzed using the Shallow Parsing and Eminently Judicious Disambiguation (SPEJD) application⁸—a tool for partial parsing and rule-based morphosyntactic disambiguation. For the distribution of texts among annotators and later—super-annotators—the **DISTSYS** application was used⁹, which also stored annotated data. This tool had already been used in the Polish Corpus of Coreference (Ogrodniczuk *et al.* 2015: 97–99) and proved its usability in different types of annotation

8 <http://zil.ipipan.waw.pl/Spejd/>.

9 <http://zil.ipipan.waw.pl/DistSys>.

tasks. The `DISTSYS` tool was configured for Synamet project purposes, which involved the specification of users (annotator and super-annotators) and limits on texts per download. The `DISTSYS` server stored information about which annotator analyzed which text, and which super-annotator amended which text. This configuration ensured that super-annotators would never correct the texts they had previously annotated. The process of downloading texts from the server and returning them after finishing annotation required several steps. First, an annotator had to start `manager.exe`; in the simple interface two options were possible—`ANOTACJA` ‘annotation’ and `SUPERANOTACJA` ‘super-annotation’. After choosing one of the options, an annotator selected Download from the Files menu and entered a number of files (maximum 10) in the Download window. The files then showed up in the `ANOTACJA` ‘annotation’ or `SUPERANOTACJA` ‘super-annotation’ tabs. The tab consist of several columns: File (showing each text identifier)—i.e., a Category (e.g., `PERFUME`), blog name, and entry number, (e.g., `perfumy_nexdeluxe_0146`), Status (indicating if a text had been modified), Ready (showing if an annotator had marked the text as ready), and an Open button, which opened the text in a window of the main annotation tool. An annotator could also send texts that were defective (e.g., were extracted in part only) back to the server. After annotation was completed, an annotator chose a command in the File menu `Zakończ pracę nad zaznaczonymi tekstami` ‘complete work on selected files’ and the annotated files were sent back to the server.

The manual MU analysis was facilitated by a dedicated computer application called `ATOS`. After clicking on the `Otwórz` ‘open’ button in the `manager.exe` menu, the main window of the `ATOS` tool would appear. `ATOS` is a desktop application, which contains a two-layer editor. On the left of the main window, annotators can see the whole text (an excerpt from a blog) and the source of the text. Below the text, annotation instructions were shown. The main editor menu enabled an annotator to mark elements, such as `Temat` ‘topic’ (a referent), `Aktywator` ‘activator’ (a word evoking a frame), `Magazyn` ‘store’ (borderline metaphors), and `Jednostka` ‘unit’ (a MU). The main menu also contained a classification of complex metaphors (explained in detail in the next section).

All marked elements would appear on the right of the main `ATOS` window. There were four tabs: `Jednostki` ‘units’, `Tematy` ‘topics’, `Aktywatory` ‘activators’, and `Magazyn` ‘Store’. Below was a space for annotator’s notes (`Notatki`). A view of the `ATOS` main editor is shown in Fig. 2.

After marking a phrase, a sentence, or a text fragment as a `Jednostka` ‘unit’ in the main `ATOS` editor, a new window opens—an editor for MUs (see Fig. 3).

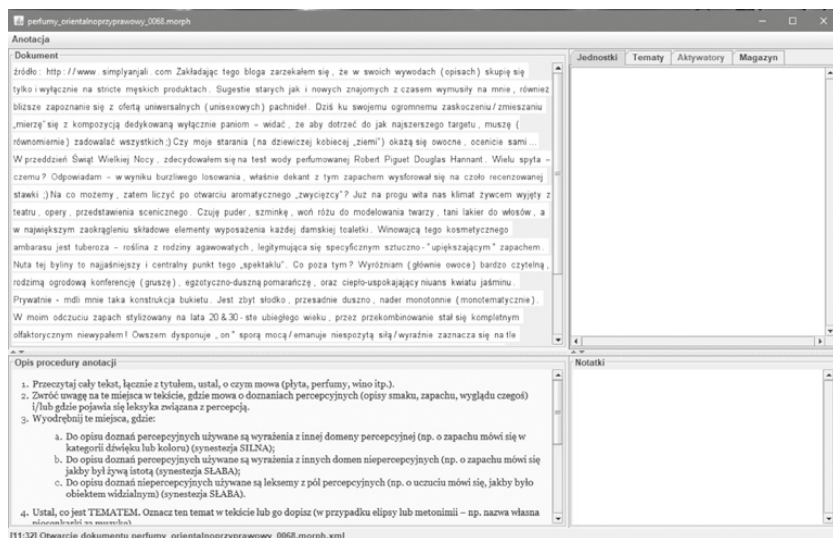


Fig. 2: The main window of the ATOS editor.

The first part of the MU editor annotated the following attributes of a MU: in the box *Fraza tekstowa* ‘text phrase’, a MU appeared in its actual form. In the box *Pełna fraza* ‘full phrase’, annotators could complement missing elements of the phrase in case of ellipsis. Below was the *Metafora pośrednia* ‘indirect metaphor’ box (more about this problem in the *Annotation procedure* section and the *Metaphors in Synamet* chapter). The *Temat* ‘topic’ box enabled annotators to choose a topic from the list of topics already marked in the main ATOS window. In the *Typ frazy* ‘phrase type’ box, annotators could choose a grammatical description of the MU from the list (see more about the list in the section *Annotation procedure*). The *Siła MS* ‘strength of MU’ box classified the MU as a strong synesthetic metaphor or a weak synesthetic metaphor. The asterisk meant that filling a box was obligatory. The *Kategoria* ‘category’ box enabled annotators to choose from the list if the MU is a simple synesthesia, a multimodal synesthesia, or belongs to the category *Inna* ‘other’ (when one of the frames was non-perceptual). The last box in the first part of the MU, the editor selected the phrase’s semantic head—*Głowa frazy* (more about the semantic head in the *Annotation procedure* section).

The next part of the editor’s window was entitled *Rama źródłowa* ‘source frame’ and it enabled an annotator to choose all necessary descriptions of a

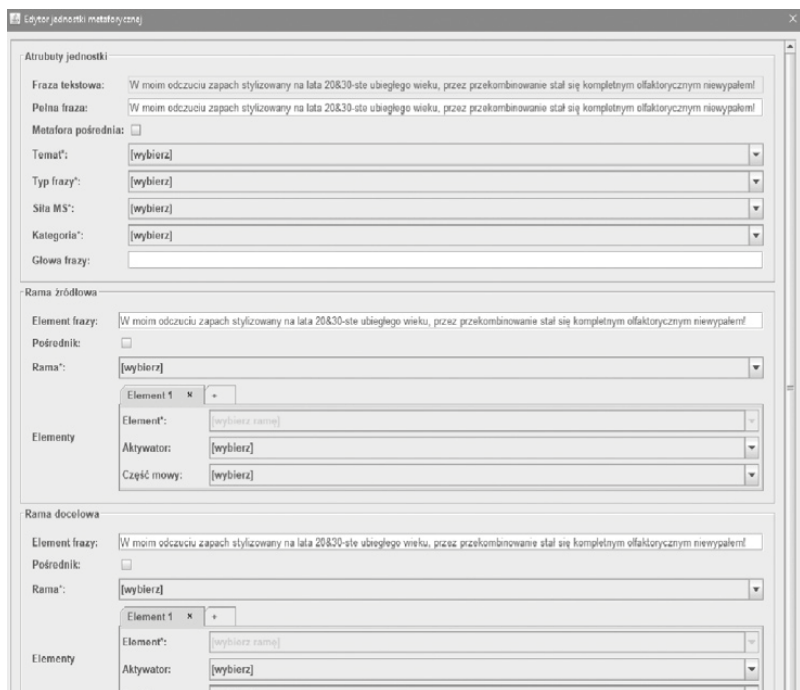


Fig. 3: The editor of metaphorical units in ATOS.

source frame evoked by a MU. The Element frazy ‘phrase’s element’ box selected the part of a phrase where a word evoking the source frame occurred. In the Rama ‘frame’ box, annotators had to choose the relevant source frame from a list. In the Synamet corpus, the frames and their elements were adjusted to the analyzed texts from the blogs—i.e., the frame coordinator (the project principal investigator) added new frames or their elements whenever an annotator signaled that such modifications were needed. The Elementy ‘elements’ boxes enabled annotators to select one or more elements of the source frame (there was a tab + for adding more FEs). In this section, annotators also had to choose an activator (or activators) of the frame element (in the Aktywator ‘activator’ box) and provide a grammatical description of the word evoking the frame element (in the Część mowy ‘part of speech’ box). The box Pośrednik ‘mediator’ was used for indirect metaphors only. The next section—designed for a target frame description—was identical to the previous section.

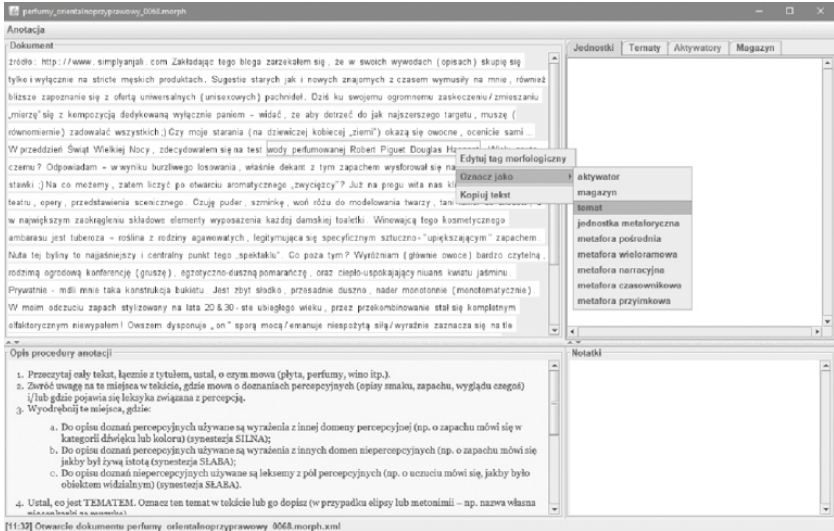


Fig. 4: Selecting a topic in a text.

2.3 Annotation procedure

In this section, a more detailed, step-by-step description of the annotation procedure is provided.

2.3.1 Topic selection

The initial step of the annotation procedure involved the selection of a metaphorical topic. In case the metaphorical topic was not expressed directly in a text, an annotator could add a non-textual topic. Fig. 4 shows the selection of a topic from a perfume review in the blog *orientalnoprzyprawowy.pl*—in this case the topic (the referent) is the perfume *Hannant* by Robert Piquet Douglas.

Fig. 5 presents the result of the topic selection—the text fragment is highlighted with orange and in the tab *Tematy* ‘topics’, the base form of the phrase (in nominative case) and a keyword in square brackets [perfumy] ‘perfume’ appear.

The reason for adding keywords to topics was twofold. The majority of topics were proper names and in most cases, corpus users would not be able to guess by themselves if the referent was wine, perfume, or a rock band. The search engine of the Synamet corpus also enables users to find all MUs within the same topic category. Therefore, annotators were provided with a short list of topic keywords. The list is given below, in the Tab. 1.

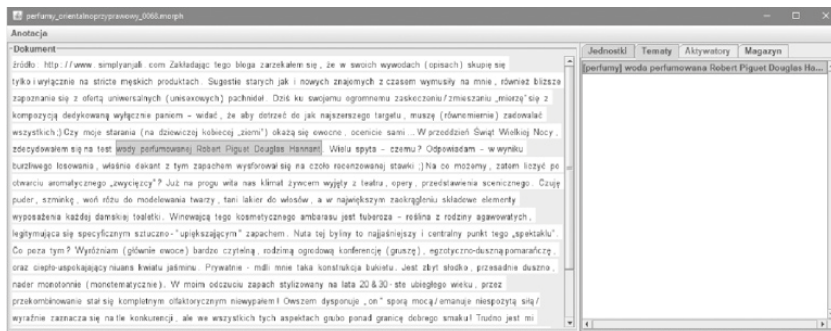


Fig. 5: The topic in the main ATOS window.

2.3.2 Annotation of activators

The next step was selecting a word or words evoking source and target frames (the latter was often omitted in texts). For example, in the text from the blog *orientalnoprzyprawowy.pl*, one of the words evoking the target frame is *zapach* 'smell' (see Fig. 6). The activators were highlighted in green in the main ATOS window and the word appeared in the tab *Aktywatory* 'activators'. Annotators had to modify a text form of a word and give its base form (e.g., in the case of nouns, in nominative case). Therefore, a list of activators of the project was provided in the glossary of the Synamet corpus. The search engine of the corpus enables users to find all MUs with a selected lexical unit.

In the MU editor, annotators had to assign an activator to a source or a target frame and choose an adequate source or target frame element. Each activator was also classified as a particular part of speech. The list of parts of speech is given in Tab. 2.

2.3.3 Metaphorical unit annotation

After selecting topic and activators in the main ATOS window, annotators marked a fragment of the text, which was interpreted as a MU. As mentioned earlier, MUs can be single words (usually lexicalized metaphorical terms, e.g., *nuta* 'note' in perfumery business or *kawałek* 'piece' in music), phrases, sentences, or text fragments, see examples (8)-(11).

- (8) piżmak
'muskat'

Tab. 1: List of topic keywords.

Słowo kluczowe	Keyword translation
<i>danie</i>	dish
<i>kuchnia</i>	cuisine
<i>napój</i>	drink, e.g., coffee, wine, beer
<i>smak</i>	taste
<i>składowa smaku</i>	taste component
<i>smak pierwszy</i>	first gustatory perception
<i>smak końcowy</i>	final gustatory perception
<i>perfumy</i>	perfume
<i>składowa zapachu</i>	smell component
<i>zapach</i>	smell
<i>zapach końcowy</i>	final olfactory perception
<i>zapach pierwszy</i>	first olfactory perception
<i>zapach środkowy</i>	middle olfactory perception
<i>kreator</i>	perfumer
<i>muzyka</i>	music
<i>wykonawca</i>	musician (e.g., singer, band)
<i>fraza muzyczna</i>	music fragment
<i> płyta</i>	album
<i>styl muzyczny</i>	musical genre (e.g., rock, blues)
<i>utwór</i>	piece of music
<i>percepcja słuchowa</i>	auditory perception
<i>kosmetyk</i>	cosmetic
<i>wrażenie dotykowe</i>	tactile perception
<i>wrażenie wzrokowe</i>	visual perception
<i>człowiek</i>	person
<i>uczucie</i>	feeling
<i>emocja</i>	emotion
<i>opinia</i>	opinion
<i>zdrowie</i>	health
<i>stan/akcja</i>	state/action
<i>miejsce</i>	place
<i>czas</i>	time
<i>abstrakt</i>	abstract idea
<i>cecha abstraktu</i>	feature of abstract idea
<i>sztuka</i>	art
<i>natura</i>	nature
<i>rzecz</i>	artifact

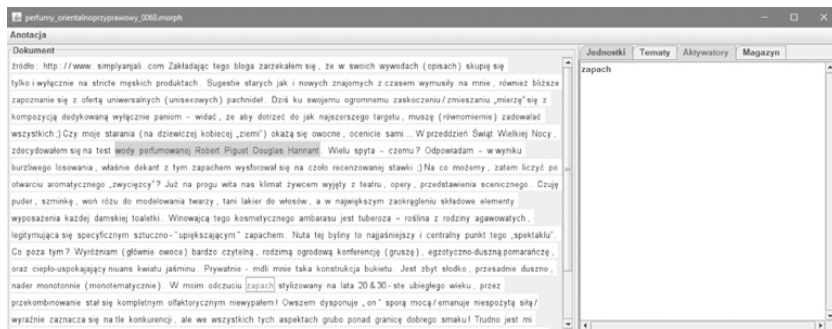


Fig. 6: Selection of an activator in the main ATOS' window.

Tab. 2: The list of grammatical descriptions of activators in Synamet.

Symbol	Description
Noun	Noun
Ger	Gerunds
Num	Numeral
Adj	Adjective
Adv	Adverb
Verb-dk	Perfective verb
Verb-ndk	Imperfective verb
Pred	Predicate ^a
Ppas	Past participle
Pact	Present participle
Prep	Preposition
XXX	Other (e.g., foreign proper names)

^a Verbs that cannot be inflected by person, e.g., *widac* 'be visible', *słychać* 'be heard'.

- (9) czysty głos lidera
'clean voice of band leader'
- (10) Intensywnie doprawiony przedpokój prowadzi do cytrusowego salonu, który jak dla mnie mógłby zajmować trochę mniej miejsca, bo najbardziej wartościowa jest kuchnia – serce domu! (<https://www.opinie-perfumu.pl/scent-departure-abu-dhabi/>)
'The intensively flavored hallway leads to the citrus living room, which could be smaller in my opinion, because the most valuable is the kitchen—heart of a home!'

- (11) Emerald Reign zapowiadany jest jako perfumeryjny tygrys władający przestrzenią. Mocne nuty, butny opis, a tygrys...leniwy.
 ‘Emerald Reign was announced as a perfumery tiger ruling the space. Strong, arrogant characterization, and the tiger is ... lazy’.

In (8), *piżmak* ‘muskrať’ means ‘a perfume with a musk component’. Therefore, it is a MU, since two different frames are activated—the source is the **WILD ANIMAL** frame and the target is the **SMELL** frame. The target frame is perceptual. Example (9) is a nominal phrase in which the activators *głos* ‘voice’ and *lider* ‘bandleader’ evoke the **HEARING** target frame and the activator *czysty* ‘clean’ evokes the **VISION** source frame. In this case, both frames are perceptual. In the next example (10), which is a sentence, the aroma of the perfume *Scent of Departure* by Abu Dhabi is described as a home; thus, the source is the **HOME** frame and the target is the **SMELL** frame. In (11), the MU is a text fragment, since the metaphor extends past the border of a sentence. The source is the **WILD ANIMAL** frame, evoked by the noun *tygrys* ‘tiger’, and the target is the **SMELL** frame, evoked by the perfume name *Emerald Reign* (by House of Sillage).

The selection of a MU in the main ATOS window automatically enabled the MU editor. Fig. 7 presents an analysis of a MU excerpted from the blog orientalnoprzyprawowy.pl: *W moim odczuciu zapach stylizowany na lata 20&30-ste ubieglęgo wieku, przez przekombinowanie stał się kompletnym olfaktorycznym niewypałem!* ‘In my impression, because of overdoing, the twenties & thirties-styled perfume has become a total olfactory live-bomb!’ The topic of the MU is the perfume *Hannant* by Robert Piquet Douglas.

Afterwards, annotators had to describe the grammatical form of the MU. The following list of grammatical forms opened in the ‘Typ frazy’ ‘type of a phrase’ box: NG (nominal phrase), NumG (numeral phrase), AdjG (adjective phrase), PartG (participial phrase), PrepNG (prepositional phrase), AdvG (adverbial phrase), VG (verbal phrase), Sent (sentence), or Text (text fragment). The strength of the MU could be strong (both frames are perceptual) or weak (only one frame is perceptual). In the case of the analyzed example, the MU is weak. In the ‘Kategoria’ ‘category’ box, annotators selected one of the values from the list: Prosta synestezja ‘simple synesthesia’ (both frames are perceptual and none of them is **MULTIMODAL PERCEPTION**), Synestezja złożona ‘complex synesthesia’ (both frames are perceptual and one of them is **MULTIMODAL PERCEPTION**), and Inna ‘other’ (only one of the frames is perceptual). In the case of the analyzed example, the category is Inna ‘other’.

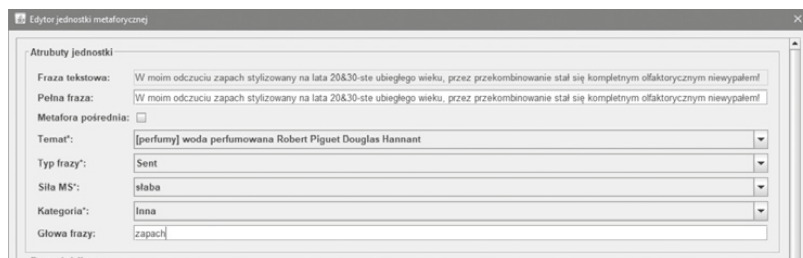


Fig. 7: The general characteristics of a MU in the ATOS editor of metaphorical unit.

The last step of the MU general characteristic was selecting a semantic head of a MU (in the *Głowa frazy* box). A semantic head of a MU was defined by Wróblewski (1998) as an element of a metaphorical expression that is construed within realistic conventions (i.e., it denotes a referent of the MU). In the analyzed example, the semantic head is the noun *zapach* ‘smell’, referring directly to the perfume. In numerous MUs, semantic heads were omitted in texts. Quite often, the semantic head was not the syntactic head of a phrase, e.g., *waniliowe słońce* ‘vanilla sun’—in the phrase, which described the perfume’s aroma, the source frame is evoked by the noun *słońce* ‘sun’, while the target frame is evoked by the subordinate adjective *waniliowy* ‘vanilla’; thus, the adjective is the semantic head of the phrase, while the noun is the syntactic head.

In Synamet, the metaphorization process is defined by Jang *et al.* (2017) as “a metaphor occurs when a speaker brings one frame into a context governed by another frame, and explicitly relates parts of each, so that the original frame’s expectations are extended or enhanced according to the new frame” (320). Therefore, after completing the general characteristics of a MU, annotators had to choose a source frame and its element(s) and a target frame and its element(s). In Fig. 8, a fragment of the analyzed example (Element frazy ‘phrase element’) *stał się kompletnym niewypalem* ‘has become a total live-bomb’ is provided. The source frame is the **ARMY** frame (WOJSKO). In the Element ‘element’ box, *STATE/CHANGE OF STATE OF AN INSTRUMENT* (stan/zmiana stanu narzędzia) is selected. The activator is the noun *niewypał* ‘live-bomb’ and the part of speech (*Część mowy*) is a noun.

In the analyzed example, the target is the **SMELL** frame (ZAPACH) and there are two activators (compare two tabs in Fig. 9—Element 1 and Element 2): the noun *zapach* ‘smell’ and the adjective *olfaktoryczny* ‘olfactory’—both evoking the same frame element **SMELL** (ZAPACH) (Fig. 9).

Fig. 8: The source frame description in the editor of MU.

Fig. 9: The target frame description in the editor of MU.

Quite often, there were no activators of target frames in an annotated text. In such cases, annotators had to choose a frame and its element(s) on the basis of broad context and the activator box would remain empty.

2.3.4 Atypical metaphorical units annotation

Since CMT was chosen as the main method of description, the ATOS tool was designed according to this theory. ATOS' editor of metaphorical expression allowed annotators to describe metaphors, which can be expressed in the dual *X is Y* schema, e.g., *Womanity*¹⁰ *gaśnie powoli* 'Womanity fades slowly'—SMELL IS A LIGHT—or *Tyle innych burgundów cierpi na sklerozę i haluksy* 'So many other Burgundies suffer from sclerosis and bunions'—WINE IS A PERSON. However, during the annotation of texts from blogs, three types of atypical MUs were distinguished that could not be described using the CMT method. The annotation tool needed to be adjusted to capture these new phenomena. Problematic metaphors found in the corpus included mixed metaphors (see Kövecses 2016: 3), indirect

10 The name of a perfume by Thierry Mugler.

metaphors (called *entangled metaphors*), and narrative metaphors (Gibbs 2017; Ritchie 2017a, b). In this section, I briefly outline the method of annotation of the problematic MUs. The major analysis of atypical metaphors can be found in the *Metaphors in Synamet* chapter.

2.3.4.1 Mixed metaphors

Mixed metaphors are typical phenomena in blogs, where one topic (a referent) can be combined with several source frames in one phrase, sentence, or text fragment, as in (12):

- (12) [...] neroli¹¹ brzmi tak jak zazwyczaj, czyli głównie zielono i kwiatowo, z lekką nutą octanową (to jaśmin), która wydaje mi się nie na miejscu. Składniki oud — toczony grzybem drewno, pewna smolistość — na chwilę ustępują świergotowi neroli, ale potem łagodnie obejmują przewodnictwo, a neroli dziwnie zaokrągła całość. (<http://nosthrills.blox.pl/2015/08/Au-Pays-de-la-Fleur-dOranger-Neroli-Oud-Eau-de.html>) ‘[...] **neroli** [topic] **sounds** [HEARING] like usual, that is mainly **greenly** [VISION] and flowery with a **light** [MULTIMODAL PERCEPTION] acetate **note** [HEARING] (jasmine), which seems to be out of **place** [SPACE]. **Oud** [topic] components—**wood eaten by fungus** [VISION], some of **pitch-blackness** [VISION]—for a moment give in for a **chirping** [HEARING] of neroli, but later gently **take the leadership** [PERSON], while neroli strangely **rounds off** [VISION] the **whole** [THING].’

The problem of mixed metaphor annotation in Synamet is that CMT only allows annotators to describe two frames (one source and one target) at a time. Therefore, they must describe mixed metaphors in Synamet in two steps. First, the mixed metaphor must be tagged in a text, in the main ATOS window, as metafora wieloramowa ‘multi-frame metaphor’, as in (13):

- (13) Santo Stefano i Santo Stefano Riserva to wina głębokie, długie, eleganckie, o twardej ramie garbników, a zarazem mięsistej, sutej materii.
‘**Santo Stefano i Santo Stefano Riserva** [topic] are deep, long, elegant wines, with a hard frame of tannins and at the same time fleshy, ample fabric.’

The next step was to divide the mixed metaphor into smaller pieces, complying with the general schema of *X is Y*, e.g., *deep wines* (MULTIMODAL PERCEPTION → TASTE), *long wines* (VISION → TASTE), *elegant wines* (CLOTHES → TASTE), *a hard frame of tannins* (ART → TASTE), or *fleshy, ample fabric* (TOUCH → TASTE).

11 Au Pays de la Fleur d’Oranger Eau de Madeleine perfume by Les Inedites.

2.3.4.2 Indirect (entangled) metaphors

There is yet another type of metaphor that makes annotation quite problematic. It is called *metafora pośrednia* ‘indirect metaphor’ or an *entangled metaphor*. This type of MU consists of a hypallage,¹² highly condensed hidden metaphors, and is often conflated with metonymies. In this case, the syntax of the MU contradicts its semantics. For example, the sentence *Ta płyta to mroczna podróż przez 20 utworów* (‘This record is a dark journey thorough 20 pieces’) might at first sight resemble a simple synesthetic metaphor. But as we look closer, we can see that the adjective *dark* does not refer to the noun it modifies (*journey*) but rather to the music on the record. The phrase contains a compressed and multilevel metonymic and metaphorical meaning: the record (that is, metonymically, music) is dark (**VISION** → **HEARING**) and the record (that is, metonymically, listening to music) is a journey (**JOURNEY** → **HEARING**). In Synamet, such metaphors were annotated in three steps. First, annotators had to mark these types of metaphor in the main ATOS window, e.g., *konstrukcja bukietu* ‘construction of a bouquet’, and choose from the menu *Oznacz jako* ‘mark as’ *metafora pośrednia* ‘indirect metaphor’ (see Fig. 10).

Then, the metaphorical term *bukiet* ‘bouquet’ was described: the word activated the **PLANT** frame and the element *COLLECTION OF PLANTS*, and on the basis of a broad context (a perfume review), the annotator could determine that the target was the **SMELL** frame and its element *COMPLEX OLFACTORY SENSATION*. In the metaphor editor, the box indirect metaphor was checked and the noun *bukiet* ‘bouquet’ was marked as the *pośrednik* ‘mediator’, i.e., an activator that is reorganized by frame shifting and becomes a metaphorical term, by moving it from the original frame (**PLANT**) to a new one (**SMELL**) (see Fig. 11).

The next step was an annotation of the phrase *konstrukcja bukietu* ‘construction of bouquet’. Again, the *metafora pośrednia* ‘indirect metaphor’ box in the editor was checked. For the noun *konstrukcja* ‘construction’, the source frame **ARCHITECTURE** was chosen and the *CONSTRUCTION* element, but this time as the target **SMELL** frame activator was the noun *bukiet* ‘bouquet’, which was marked again as the *pośrednik* ‘mediator’ (see Fig. 12).

12 This refers to a transposition of the natural relations of two elements in a proposition, for example in the sentence ‘Melissa shook her doubtful curls’ (<https://en.oxforddictionaries.com/definition/hypallage>).

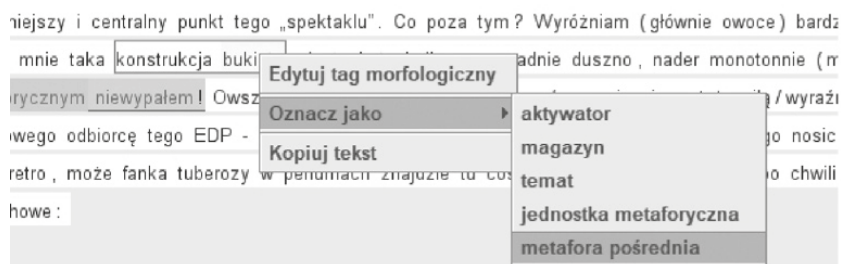


Fig. 10: The initial step of an indirect metaphor annotation in the main window of ATOS.

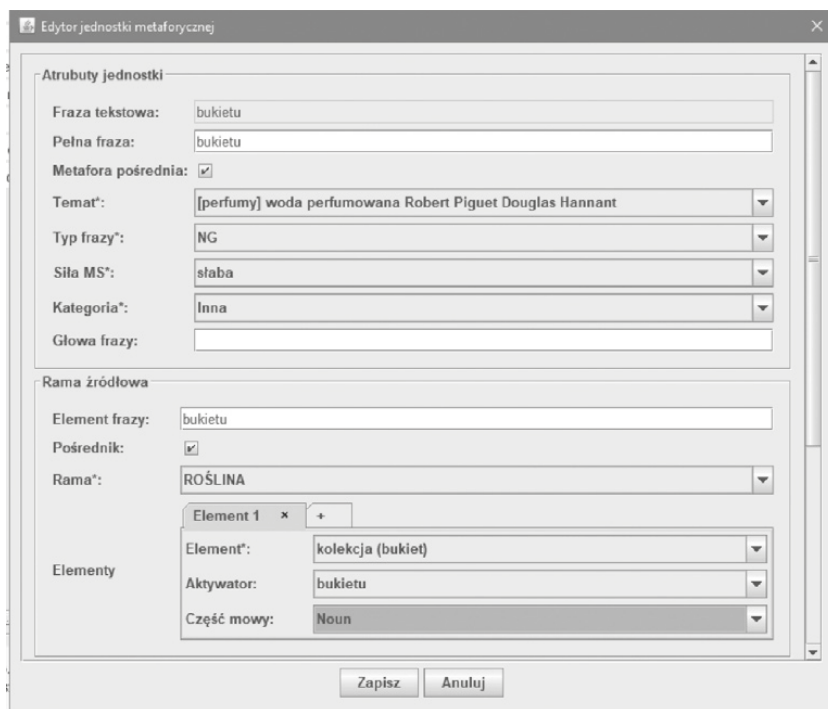


Fig. 11: Annotation of a mediator in an indirect metaphor (example—*bukiet* ‘bouquet’).

The screenshot shows a software interface for indirect metaphor annotation. It is divided into two main sections: 'Rama źródłowa' (Source Frame) and 'Rama docelowa' (Target Frame).

Rama źródłowa (Source Frame):

- Element frazy: konstrukcja
- Pośrednik:
- Rama*: ARCHITEKTURA
- Elementy:
 - Element 1: konstrukcja obiektu
 - Aktywator: konstrukcja
 - Część mowy: Noun

Rama docelowa (Target Frame):

- Element frazy: bukietu
- Pośrednik:
- Rama*: ZAPACH
- Elementy:
 - Element 1: zapach złożony
 - Aktywator: bukietu
 - Część mowy: Noun

At the bottom of the interface, there is a note: '*pole jest obowiązkowe' and two buttons: 'Zapisz' and 'Anuluj'.

Fig. 12: The last step of an indirect metaphor annotation (*konstrukcja bukietu* ‘construction of bouquet’).

2.3.4.3 Narrative metaphors

A narrative metaphor is “one conceptual metaphor that motivates several related linguistic expressions in the same stretch of discourse” (Gibbs 2017: 47). Ritchie (2017b: 242) calls this phenomenon a *metaphorical story* and defines it as “subcategory of communication in which a vehicle story is at least narrated, such that it expresses something about, and can be mapped onto, a topic story from a totally different domain”, e.g., (14):

- (14) Hedonist Rose¹³ to pełna dziewczęcego uroku towarzyszka, która spędzi z Tobą przy butelce wina cały dzień, od niechcenia rzucając zalotne spojrzenia i chichocząc. Od początku myślisz, że wszystko o niej wiesz, ale ciągle wyprowadza cię z błędu.

13 A name of a perfume by Victoria Minya.

Kiedy chce coś przemilczeć, rysuje palcem wzorki na zroszonej ścianie kieliszka, żeby odwrócić Twoją uwagę, ale jeśli przyjrzyj się jej uważnie, dostrzeżesz melancholię. To dziewczyna o drugim dnie, które wolałaby ukryć. Mogłabym się założyć, że słucha The Smiths. (<http://pachnacehistorie.pl/2015/03/27/viktoria-minya-hedonist-rose/>)

‘Hedonist Rose is a companion full of girlish charm who would spend a whole day with you over a bottle of wine, glancing coquettishly and giggling. From the start, you think that you know everything about her but she always puts you right. When she wants to pass something over the silence she draws patterns with her finger on a dewy glass to distract your attention, but if you look closer you will discern her melancholy. She is a girl with a hidden agenda that she would prefer to mask. I bet she listens to The Smiths.’

Such narrative metaphors can encompass extensive fragments of a discourse or even a whole text. In Synamet, these examples were tagged as narrative metaphors in the main ATOS editor, and only the first phrase (*Hedonist Rose is a compeer*, PERSON → SMELL) was annotated in the ATOS’s MU’s editor. It was impossible to describe whole narrative metaphors using CMT since, in most cases, there was no typical metaphorical transfer from a source frame onto a target frame (see the *Metaphors in Synamet* chapter).

2.3.5 Annotator inter-agreement

In Synamet, a series (cascade) annotation procedure was employed instead of a parallel one, since an experiment set up for the Polish Coreference Corpus proved that the outcome of series annotation is better than the outcome of parallel annotation (Ogrodniczuk *at al.* 2015: 89). Therefore, texts in Synamet were first analyzed by four annotators¹⁴ and subsequently by three super-annotators, who amended the initial annotation and checked the corpus’s coherence. In the final stage, the principal investigator proofread the corpus and decided what to do with borderline metaphors.

Although series annotation was chosen as the main method in Synamet, an experiment was performed with parallel annotation. Annotator inter-agreement was tested for a small subset of texts (40 blog entries analyzed independently by two annotators) with the Cohen ‘kappa’.

14 All annotators and super-annotators were Masters or PhDs in linguistics, with specialization in lexical semantics.

Tab. 3: Cohen ‘kappa’ test for the annotator inter-agreement.

	Kappa	z	p-value
Typical metaphor	0.77	2.53	0.011
Mixed metaphor	0.95	3.05	0.002
Entangled metaphor	0.80	2.74	0.006
Narrative metaphor	0.93	3.03	0.002

Results were as follows (see Tab. 3): a moderate level of agreement for typical metaphors ($\kappa = 0.77$), an almost perfect level of agreement for mixed metaphors ($\kappa = 0.95$), a strong level of agreement for entangled metaphors ($\kappa = 0.80$), and an almost perfect level of agreement for narrative metaphors ($\kappa = 0.93$). The experiment showed that despite the complex procedure of annotation and problematic data, annotator inter-agreement was high enough to expect that the Synamet corpus is relatively trustworthy.

3 Composition of the Synamet corpus

There has recently been increasing interest in corpus-based studies of metaphor. Overviews of related studies can be found in *Researching and Applying Metaphor* (Cameron and Low 1999), *Discourse Approaches to Metaphor Research* (Deignan 2005), *Corpus-Based Approaches to Metaphor and Metonymy* (Stefanowitsch and Gries 2006), Semino's *Metaphor in Discourse* (2008), and *Metaphor Analysis. Research Practice in Applied Linguistics, Social Sciences and the Humanities* (Cameron and Maslen 2010). In addition, metaphors in various discourse types have been comprehensively studied, e.g., in ideological discourse (Goatly 2006), in political and economic discourse (Skorczynska and Deignan 2006), in advertising (Lundmark 2005), and in educational discourse (Cameron 2003). There are still only a few studies of metaphor in (larger or smaller) Polish corpora. Wróblewski's book *Struktura, typologia i frekwencja polskich metafor* (1998), which studies the frequency of metaphors in four 100,000-word corpora, is particularly noteworthy. Another significant monograph is *Metaforyka Leśmiana. Analiza lingwistyczna* (2011) by Cockiewicz, which provides a thematically organized dictionary of metaphors occurring in Leśmian's poetic texts. Moreover, Badyda, in her dissertation "*Upadły anioł zmysłów*?" *Metaforyka zapachu i percepcji węchowej we współczesnej polszczyźnie* (2013), examines examples excerpted from the PWN corpus and the IPI PAN corpus, as well as texts from the Internet.

Metaphor has not just been studied in existing corpora—there are also specialized corpora of figurative language. Musolff (2004, 2006) reports on a pilot corpus called Eurometa I, which consists of 2,110 texts from 28 British and German newspapers and magazines covering the years 1989–2001. The extended version of the corpus is EUROMETA II (containing 494,000 words), which is a bilingual corpus of metaphors used in British and German political discourse about Europe. BODYPOL corpus (610,000 words) comprises body-based metaphors used in public media and political discourse in eight different languages (Dutch, English, French, German, Greek, Italian, Russian, Spanish, and Swedish). Unfortunately, these corpora are not accessible online. The only corpus of metaphors at our disposal—*VU Amsterdam Metaphor Corpus*—exclusively analyzes lexemes that in a given context acquire either a figurative or literal meaning. The corpus employs the *BNC Baby* (the 4 million sub-corpus of the British National Corpus). Among the tagged texts, there are academic texts, news texts, fiction, and conversations. The authors divided metaphors into the

following categories: 1) *clear metaphors*: *direct* (displaying a contrast between the contextual and more basic meaning), *indirect* (a contrast and comparison between the contextual and more basic meaning), and *implicit metaphors* (due to an underlying cohesive grammatical and/or semantic link in the discourse that points to recoverable metaphorical material), 2) *personifications*, and 3) *borderline metaphors*. The last category includes expressions whose metaphorical status was unclear to the annotators. Additionally, metaphor signals (such as *like, as, as if, so-called*) have been taken into consideration. Unlike the above projects, Synamet focuses entirely on synesthetic metaphors—it contains texts from blogs devoted to fields where synesthetic metaphors were most likely to be found, e.g., blogs devoted to perfume (**SMELL**), wine, beer, yerba mate, or coffee (**TASTE, SMELL, VISION**), as well as culinary blogs (**TASTE, VISION**), music blogs (**HEARING**), art blogs (**VISION**), and massage and wellness blogs (**TOUCH**). The main assumption of the Synamet project was that a metaphor is primarily a pragmatic phenomenon that depends heavily on broad context. Cameron (2007) argues that “to understand metaphor, we need to study it in its context of use” (42). Wiben Jensen (2017) notes that “it is vital [...] to attempt to capture metaphoricality in its natural surroundings” (262). Therefore, it was essential to focus on analyzing authentic texts instead of fabricated ones or highly lexicalized idioms, and to analyze entire texts (entries) from the chosen blogs, and not just excerpts. It makes the Synamet corpus the first corpus of metaphor in Polish, and the first corpus of synesthetic metaphors in the world.

The Synamet corpus contains in total the following:

1. 685,648 tokens (segments),
2. 1,414 annotated texts (i.e., entries) from blogs,
3. 2,597 metaphorical topics (i.e., referents of metaphorical expressions),
4. 15,855 activators (words or phrases that activate various frames), and
5. 9,217 grammatically and semantically annotated MUs.

Synamet consists of 11 categories of texts from thematic blogs (sub-corpora):

- 1) BEER (beer reviews),
- 2) COFFEE (coffee and café reviews),
- 3) COSMETICS (reviews of creams, lotions, masks, shampoos, etc.)
- 4) CUISINE (culinary blogs),
- 5) CULTURE (reviews of theatre, ballet, and operatic performances and exhibitions)
- 6) MASSAGE (blogs written by massage therapists),
- 7) MUSIC (reviews of albums, songs, and concerts),

Tab. 4: Number of blog entries, tokens, and MUs in each category.

Category	Texts	Tokens	MUs
Beer	73	40,149	1,128
Coffee	208	90,767	72
Cosmetics	36	15,437	64
Cuisine	98	86,966	97
Culture	169	50,947	163
Massage	70	80,378	46
Music	293	127,850	2,542
Perfume	259	91,328	3,961
Wellness	94	40,585	53
Wine	99	54,529	1,033
Yerba	15	6,712	58

Tab. 5: Five-number summary of the Synamet categories.

	Texts	Tokens	MUs
Min.	15.0	6,712	46.0
1st Qu.	71.5	40,367	61.0
Median	98.0	54,529	97.0
Mean	128.5	62,332	837.9
3rd Qu.	188.5	88,866	1,080.5
Max.	293.0	127,850	3,961.0

- 8) PERFUME (perfume reviews),
- 9) WELLNESS (blogs concerning physical and mental health)
- 10) WINE (wine reviews),
- 11) YERBA (yerba mate¹⁵ reviews).

The blog entries, tokens, and MUs in each category are presented in Tab. 4. The five-number summary (the information of the dataset—minimum value, maximum value, first quartile, median, mean, and third quartile) is shown in Tab. 5.

The categories of synesthetic metaphors exhibit different levels of productivity. Fig. 13 presents the raw number of tokens and the raw productivity of synesthetic metaphors (MUs) in each category.

¹⁵ Yerba mate is used to make a tea beverage known as *mate* in Spanish and Portuguese.

Composition of the Synamet corpus

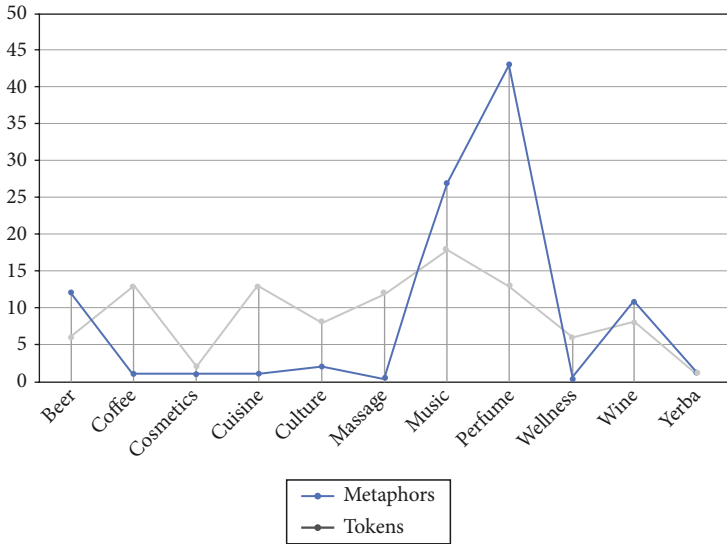


Fig. 13: Metaphorical productivity and number of tokens in each category of the Synamet corpus.

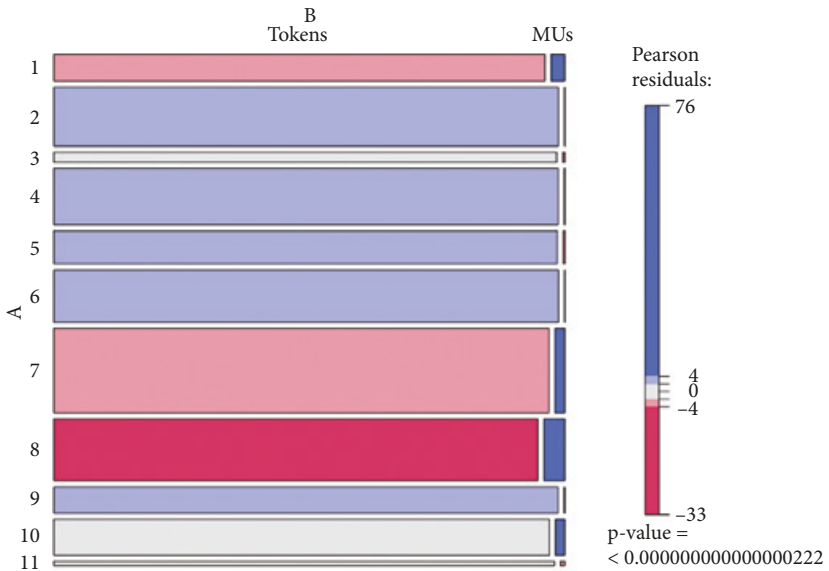


Fig. 14: Pearson residuals of tokens and metaphors in Synamet categories.

Tab. 6: Standardized Pearson residuals of tokens and metaphors in Synamet.

No.	Category	Tokens	MUs
1.	Beer	-25.750	25.750
2.	Coffee	35.240	-35.240
3.	Cosmetics	10.054	-10.054
4.	Cuisine	33.506	-33.506
5.	Culture	20.684	-20.684
6.	Massage	33.458	-33.458
7.	Music	-21.819	21.819
8.	Perfume	-82.214	82.214
9.	Wellness	21.719	-21.719
10.	Wine	-11.443	11.443
11.	Yerba	3.394	-3.394

The differences between categories are statistically significant—the chi-squared test results are $\chi = 10966$, $df = 10$, $p\text{-value} < 0.0001$, Cramer's $V = 0.12$. Fig. 14 presents the Pearson residuals of tokens and metaphors and Tab. 6 shows the standardized Pearson residuals.

The following categories have a number of tokens above expectations: COFFEE, CUISINE, MASSAGE, and WELLNESS. The largest set of synthetic metaphors contains blogs devoted to PERFUME, BEER, MUSIC, and WINE. The remaining categories have a relatively smaller contribution to synthetic metaphors. The Pearson and Kendall correlation tests show no statistically significant correlation between the number of tokens and the number of metaphor units in each category ($r = 0.516$, $t = 1.808$, $df = 9$, $p\text{-value} = 0.052$; $\tau = 0.309$, $T = 36$, $p\text{-value} = 0.109$).

4 Frames in Synamet

This chapter begins by laying out the main reasons why FrameNet’s ontology could not be implemented in the Synamet project. Furthermore, I describe the method of frame building that was adopted in the corpus. Afterwards, I give a brief overview of a frame structure, illustrated by an example of a **TOUCH** frame. I then provide the statistics for perceptual and non-perceptual frames and their elements. I analyze the results of the standardized Pearson residuals tests. The final section of this chapter examines models of verbal synesthesia in Synamet and the internal logic of frame mapping (Petersen *et al.* 2008; Sullivan 2006). On the one hand, the results of the statistics enforce the metaphor embodiment hypothesis, but at the same time, they also dispute this hypothesis. I also argue against a universal model of synesthesia for all languages (Classen 1993; Ullmann 1957; Viberg 1984; Williams 1976).

4.1 Frame ontology in Synamet

The reasons preventing the use of FrameNet’s ontology in the Synamet project were threefold. First, there are too many essential semantic and grammatical differences between Polish and English. Secondly, the predicate-oriented approach conflicts with Synamet’s reference approach. Finally, on the one hand, the frame structure in FrameNet is too general, and on the other hand, it is too detailed for the annotation purposes. Perceptual frames in FrameNet are distinguished mostly on the basis of the active or passive participation of a subject in the act, or the properties of the perceived phenomena. The most general frame is **Perception**¹⁶ (*A Perceiver perceives a Phenomenon*). The frame is inherited by the following frames: **Becoming_aware**, **Give_impression**, **Perception_active**, **Perception_experience**, and **Sensation**. The main frame **Perception** includes information that “The inheriting frames may specify the modalities (see, hear, taste, smell)”, but in fact, there are no separate frames for different types of perception. For example, the LUs *see*, *hear*, *taste*, *feel*, and *smell* evoke the frame **Perception_experience**, but the results of an act of perception are instead in the frame **Sensation** (e.g., *sight*, *aroma*, *noise*, *feeling*). The words denoting various gustatory or olfactory experiences (e.g.,

16 <https://framenet.icsi.berkeley.edu/fndrupal/frameIndex>.

bitter, bland, odor, smell, sweet, aromatic) are gathered in the **Chemical_sense_description** frame. The LUs *appear, feel, look, reek, seem, smell, sound, and taste* evoke the same **Give_impression** frame. LUs expressing tactile experiences are either not included in FrameNet (e.g., *smooth, rough, soft, hard*) or belong to the **Temperature** frame (e.g., *cold, hot, freezing*). LUs referring to different types of sounds (e.g., *beep, howl, scream*) are attributed to the **Make_noise** frame. The perceptual frame matrix in FrameNet is unintuitive, complicated, and multi-level. Furthermore, there are no separate frames dedicated to different modalities. Most LUs in those frames are verbs or adjectives, and the few nouns are mostly gerunds. Since the crucial element of the metaphor identification procedure in Synamet was referents of metaphorical expressions, denoted typically by nominal phrases, FrameNet's ontology unfortunately proved to be unhelpful in the annotation process.

The set of frames for Synamet was constructed from scratch, with several Polish studies devoted to various aspects of perception serving as references: *seeing* (Dobaczewski 2002; Dyszak 1999, 2010; Tokarski 2004; Zawisławska 2004; Zielińska 2011), *hearing* (Kładoczny 2012; Żurowski 2012), *smelling* (Badyda 2013; Bugajski 2004; Grzegorzczkova 2012; Pisarkowa 1972), *touching* (Bronikowska 2006, 2007; Nagórko 1987; Pisarkowa 1975), and *tasting* (Bronikowska 2002; Mitrenga 2009, 2010, 2011, 2014). The base for non-perceptual frames was Markowski (1990), who gathered lexemes common in all variants of Polish and grouped them into semantic categories. The initial draft of perceptual frames and their elements, based on the above sources, was supplemented with a glossary of lexemes included by those researchers to the analyzed lexical fields.

In the Synamet corpus, frames and their elements were adjusted to the analyzed texts excerpted from the blogs—that is, the frame coordinator added new frames or their elements whenever the annotators signaled that such modifications were needed. Therefore, the frames used for annotation in Synamet are language-dependent and considered to be a tool for description. According to Ziem (2014), it is essential to distinguish between two kinds of frame:

Firstly, one must differentiate between cognitively real frames and frames as instruments of analysis. Cognitive frames are activated by language users, they are usage events in Langacker's sense and thus always specified by default assumptions (see Section 6.4.1). [...] (Matrix) frames serve as an analysis grid; they are instruments to determine U-relevant knowledge, but do not represent mental entities as such. As instruments of analysis – but not as cognitive units – frames constitute empty formats that illustrate the potentials for specifying knowledge (predicators). (321)

Frames in Synamet serve primarily as an analytical instrument, neither having the status of psychologically real units nor being a model of universal mental representation.

The frame ontology used in the project is hierarchical, i.e., it consists of very general frames, e.g., **PERSON**, and within them, more specified subframes and elements: the subframe **CHARACTER** with elements including *POSITIVE CHARACTER TRAIT*, *NEGATIVE CHARACTER TRAIT*; the subframe **BODY** with elements including *BODY PART*, *GENDER*, *CORPULENCE*, *CONDITION*, *STRENGTH*, *AGE*, etc.; and the subframe **BODY STATE/MOVEMENT** with elements including *EATING*, *DRINKING*, *BREATHING*, *SECRETION* (e.g., bleed, perspire), *FACIAL EXPRESSION*, *MOVEMENT OF THE WHOLE BODY*, *MOVEMENT OF (A) HAND(S)*, *MOVEMENT OF (A) LEG(S)*, and *CHANGE OF APPEARANCE* (e.g., to gain weight, to grow thin). Although frames have subframes and elements, their structure is flatter and less complicated in Synamet than in FrameNet.

Synamet consists of six perceptual frames and 55 non-perceptual frames (e.g., **PERSON**, **OBJECT**,¹⁷ **ARCHITECTURE**, **PLANT**, **SPACE**, **TIME**, **ART**, **SOCIETY**, **ARMY**, **MAGIC**, **HAZARD**, etc.). For the annotators' convenience, every frame element is associated with one of its typical lexical representations, e.g., **PERSON/EMOTION** (*anger*), **ANIMAL/PART OF ANIMAL** (*claw*).

Perceptual frames are the core frames in Synamet. Although traditionally only five senses are distinguished, an additional perceptual frame was created for borderline types of perception. Therefore, Synamet consists of six perceptual frames: **VISION**, **HEARING**, **TOUCH**, **SMELL**, **TASTE**, and **MULTIMODAL PERCEPTION**. The last frame is for sensations that activate several senses, e.g., weight or consistency (see Judycka 1963). The **MULTIMODAL PERCEPTION** frame contains lexical items such as *light*, *heavy*, *dense*, *runny*, *convex*, or *concave*. Some researchers included these lexemes in the tactile lexical field (Nagórko 1987; Pisarkowa 1975), while others excluded them since the lexemes also activate other types of perception, not necessarily touch (Bronikowska 2006, 2007; Niesporek-Szamburska 2010; Pajdzińska 1996). In Synamet, the latter resolution was adopted.

Since a frame can be evoked by all parts of speech (verbs, nouns, and adjectives), one frame consists of all of the elements that are essential for an act of perception, i.e., a subject of perception and body part(s) serving as the

17 The **OBJECT** frame consists of general concepts associated with three-dimensional objects or substances.

Tab. 7: The TOUCH frame's structure in Synamet.

SUBFRAME	FRAME ELEMENT
SUBJECT OF PERCEPTION	—
BODY PART (<i>ręce</i> 'hands', <i>skóra</i> 'skin')	—
SUBJECT'S ACTION	<i>PERCEPTION</i> (<i>czuć</i> 'feel') <i>EXAMINATION OF STRUCTURE</i> (<i>naciskać</i> 'press') <i>EXAMINATION OF SURFACE</i> (<i>macać</i> 'feel, grope') <i>CHANGE OF OBJECT'S STATE</i> (<i>zaostrzyć</i> 'strop') <i>CHANGE OF STRUCTURE</i> (<i>złamać</i> 'broke') <i>CHANGE OF SURFACE</i> (<i>wygładzić</i> 'polish') <i>CHANGE OF TEMPERATURE</i> (<i>ogrzzać</i> 'warm up')
OBJECT OF PERCEPTION (<i>atlas</i> 'satin')	—
STATE OF AN OBJECT	<i>STATE</i> (<i>wygładzony</i> 'polished') <i>CHANGE OF STATE</i> (<i>twardnieć</i> 'harden')
SUBJECT'S CONTACT WITH AN OBJECT	<i>CONTACT WITH A WHOLE BODY</i> (<i>otrzeć się</i> 'rub') <i>CONTACT WITH A BODY PART</i> (<i>musnąć</i> 'dab')
SENSATION	—
PATTERN OF SENSATION (<i>jak jedwab</i> 'like silk')	
FEATURE OF SENSATION	<i>TEXTURE</i> (<i>gładki</i> 'smooth') <i>STICKINESS</i> (<i>lepki</i> 'sticky') <i>SUSCEPTIBILITY TO PRESSURE</i> (<i>miękki</i> 'soft') <i>SUSCEPTIBILITY TO STRETCHING</i> (<i>elastyczny</i> 'elastic') <i>SUSCEPTIBILITY TO FLEXION</i> (<i>sztywny</i> 'stiff') <i>SUSCEPTIBILITY TO DESTRUCTION</i> (<i>kruchy</i> 'brittle') <i>TEMPERATURE</i> (<i>ciepły</i> 'warm') <i>MOISTURE CONTENT</i> (<i>mokry</i> 'wet') <i>SHARPNESS</i> (<i>ostrzy</i> 'sharp')
EVALUATION OF SENSATION (<i>oślizgły</i> 'slimy')	—
INSTRUMENT (<i>gładzik</i> 'jointer')	—

instrument of perception, an object of perception, actions of a subject of perception, state or change of a state of an object of perception, features of sensation, evaluation of sensation, etc. (see Tab. 7, which presents the **TOUCH** frame).

4.2 Statistics of perceptual frames in Synamet

Perceptual frames in Synamet differ significantly regarding their frequency of serving as a source or target frame. Fig. 15 shows raw frequencies of source and target perceptual frames, Fig. 16 presents the Pearson residuals (Pearson chi-squared test results: $\chi^2 = 4594.4$, $df = 5$, $p\text{-value} < 0.0001$, Cramer's $V = 0.773$) (Zeileis, Meyer and Hornik 2007), and Tab. 8 shows the standardized Pearson residuals. The most frequent source is the **VISON** frame; slightly less frequent is **MULTIMODAL PERCEPTION**. The ultimate target is the **SMELL** frame.

More detailed interconnections between perceptual frames are presented below in the Tabs 9 and 10. Tab. 9 shows raw frequencies in perceptual source/target pairs of frames, and Tab. 10 presents the standardized Pearson residuals (Pearson chi-squared test results: $\chi^2 = 870.35$, $df = 25$, $p\text{-value} < 0.0001$, Cramer's $V = 0.213$). The most frequent pairs are **HEARING** (source) → **SMELL** (target), **VISION** (source) → **HEARING** (target), **TASTE** (source) → **SMELL** (target), and **MULTIMODAL PERCEPTION** (source) → **TASTE** (target).

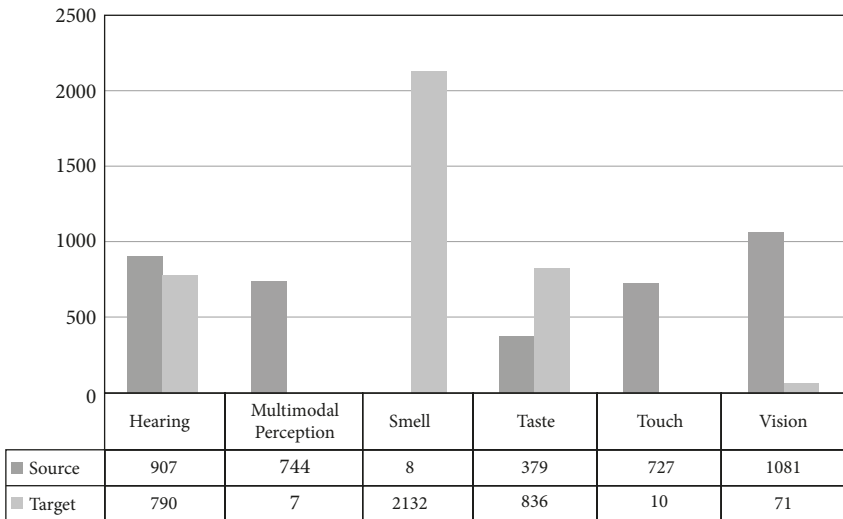


Fig. 15: The raw frequencies of perceptual frames as sources and targets in MUs.

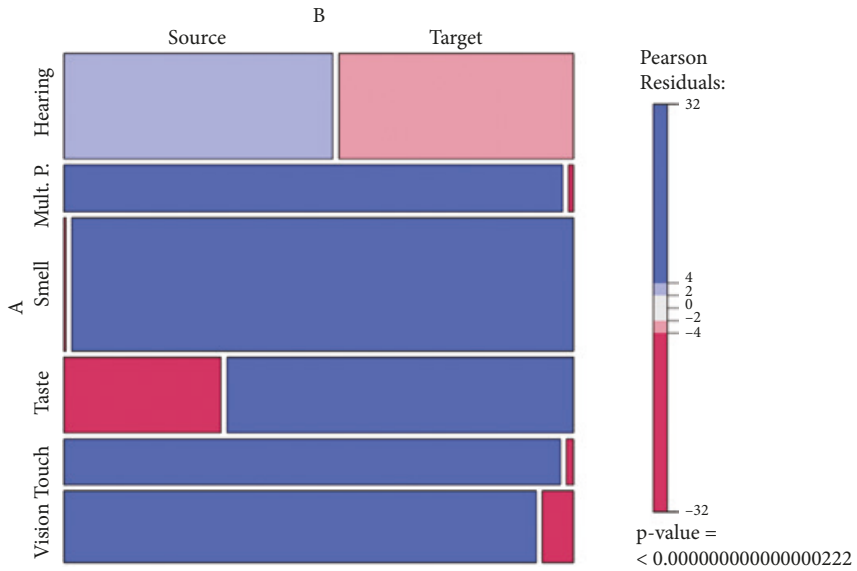


Fig. 16: Pearson residuals of source and target frames in strong synesthetic metaphors (p-value < 0.0001).

Tab. 8: Standardized Pearson residuals of the source and target frames in the strong synesthetic metaphors (p-value < 0.0001).

FRAME	SOURCE	TARGET
HEARING	3.217	-3.217
MULTIMODAL PERCEPTION	28.311	-28.311
SMELL	-54.043	54.043
TASTE	-14.287	14.287
TOUCH	27.775	-27.775
VISION	32.272	-32.272

4.3 Statistics of perceptual frames in categories

The sub-corpora vary depending on source and target perceptual frames, compared to the result for the whole corpus. In this section, I present standardized Pearson residuals for each category of texts, afterwards comparing source frames' frequencies for all corpora categories.

Tab. 9: Raw frequencies of source/target pairs of frames in strong synesthetic metaphors.

Source Target	HEARING	MULT. PERC.	SMELL	TASTE	TOUCH	VISION
HEARING		179	7	61	166	377
MULT. PERC.	0		0	0	4	3
SMELL	757	264		314	348	449
TASTE	145	259	0		184	248
TOUCH	0	5	0	1		4
VISION	5	37	1	3	25	

Tab. 10: Pearson residuals of source/target pairs of frames in strong synesthetic metaphors. Numbers marked in grey are not statistically significant (for a p-value < 0.01, numbers greater than 2.58 or less than -2.58 are statistically significant).

Source Target	HEARING	MULT. PERC.	SMELL	TASTE	TOUCH	VISION
HEARING		2.644	4.692	-2.256	1.699	13.758
MULT. PERC.	-1.471		-0.120	-0.875	2.586	0.868
SMELL	19.427	-12.190		11.309	-4.557	-10.843
TASTE	-4.802	9.627	-1.492		2.593	1.132
TOUCH	-1.759	2.457	-0.144	0.0154		0.837
VISION	-3.313	7.055	2.240	-1.606	3.542	

Tab. 11: Source-and-target frames in the BEER category (p-value < 0.0001).

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	16.481	18.288	-16.874	-24.460	13.480	13.743
TARGET	-16.481	-18.288	16.874	24.460	-13.480	-13.743

The MUs in the BEER sub-corpus have the highest frequency of the **MULTIMODAL PERCEPTION** source frame and the highest frequency of the **TASTE** target frame (Pearson chi-squared results: $\chi^2 = 1467.1$, $df = 5$, p-value < 0.0001, Cramer's V = 0.935) (see Tab. 11).

The COFFEE sub-corpus exhibits the highest frequency of the **MULTIMODAL PERCEPTION** source frame and **TASTE** target frame (Pearson chi-squared test results: $\chi^2 = 52.998$, $df = 5$, p-value < 0.0001, Cramer's V = 0.728). The results for the **HEARING** frame (as a source and as a target) are not statistically significant (see Tab. 12).

In the COSMETICS sub-corpus, the most frequent source is the **TOUCH** frame and the most frequent target is the **SMELL** frame (Pearson chi-squared test results: $\chi^2 = 28.603$, $df = 5$, $p\text{-value} < 0.0001$, Cramer's $V = 0.602$). However, the only statistically significant results are for the **SMELL** frame (see Tab. 13).

In the CUISINE category, **VISION** is most frequent source frame and **TASTE** is the most frequent target frame (Pearson chi-squared test results: $\chi^2 = 76.212$, $df = 5$, $p\text{-value} < 0.0001$, Cramer's $V = 0.832$). The results for **HEARING** and **MULTIMODAL PERCEPTION** frames are not statistically significant (see Tab. 14).

The CULTURE sub-corpus exhibits the highest frequency of **MULTIMODAL PERCEPTION** as a source frame and **HEARING** as a target frame (Pearson chi-squared test results: $\chi^2 = 27.047$, $df = 5$, $p\text{-value} < 0.0001$, Cramer's $V = 0.389$). Statistically significant results are only found for those two frames (see Tab. 15).

Although in the MASSAGE category, results of the chi-squared test cannot be calculated and the results for standardized Pearson residuals are not statistically significant, the most frequent categories are **VISION** as a source frame and **HEARING** as a target frame (see Tab. 16).

Tab. 12: Source-and-target frames in the COFFEE category ($p\text{-value} < 0.0001$).

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	2.388	2.997	-3.348	-5.210	2.689	2.707
TARGET	-2.388	-2.997	3.348	5.210	-2.689	-2.707

Tab. 13: Source-and-target frames in the COSMETICS category ($p\text{-value} < 0.0001$).

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	0.847	1.781	-4.937	1.740	2.209	-0.220
TARGET	-0.847	-1.781	4.937	-1.740	-2.209	0.220

Tab. 14: Source-and-target frames in the CUISINE category ($p\text{-value} < 0.0001$).

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	1.897464	1.897464	-3.02765	-7.526125	2.750661	4.997565
TARGET	-1.897464	-1.897464	3.02765	7.526125	-2.750661	-4.997565

In the MUSIC category, the highest frequency as a source frame is the **VISION** frame and as a target frame is the **HEARING** frame (Pearson chi-squared test results: $\chi^2 = 1286.5$, $df = 5$, $p\text{-value} < 0.0001$, Cramer's $V = 0.988$) (see Tab. 17).

The PERFUME sub-corpus is characterized by a very high frequency of the **HEARING** source frame and **SMELL** target frame (Pearson chi-squared test results: $\chi^2 = 5208.4$, $df = 5$, $p\text{-value} < 0.0001$, Cramer's $V = 0.986$) (see Tab. 18).

In the WELLNESS category, chi-squared test cannot be calculated, and standardized Pearson residuals results are not statistically significant. Nevertheless, the most frequent as a source frame is the **VISION** frame and as a target frame is the **HEARING** frame (see Tab. 19).

Tab. 15: Source-and-target frames in the CULTURE category ($p\text{-value} < 0.0001$).

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	-2.599	3.123	-2.399	0.697	2.564	-1.625
TARGET	2.599	-3.123	2.399	-0.697	-2.564	1.625

Tab. 16: Source-and-target frames in the MASAGE category.

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	-2.411	1.136	NaN	0.401	-1.808	1.410
TARGET	2.411	-1.136	NaN	-0.401	1.808	-1.410

Tab. 17: Source-and-target frames in the MUSIC category ($p\text{-value} < 0.0001$).

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	-54.334	22.734	4.542	12.793	21.819	34.151
TARGET	54.334	-22.734	-4.542	-12.793	-21.819	-34.151

Tab. 18: Source-and-target frames in the PERFUME category ($p\text{-value} < 0.0001$).

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	38.130	19.637	-72.155	23.410	25.726	26.139
TARGET	-38.130	-19.637	72.155	-23.410	-25.726	-26.139

The WINE category exhibits the highest frequency of the **VISION** source frame and **TASTE** target frame (Pearson chi-squared test results: $\chi^2 = 1286.5$, $df = 5$, $p\text{-value} < 0.0001$, Cramer's $V = 0.961$) (see Tab. 20).

In the YERBA sub-corpus, the most frequent sources are **MULTIMODAL PERCEPTION** as a source frame and **TASTE** as a target frame (Pearson chi-squared test results: $\chi^2 = 72.577$, $df = 5$, $p\text{-value} < 0.0001$, Cramer's $V = 0.935$). The standardized Pearson residuals results for the **HEARING** and **TOUCH** frames are not statistically significant (see Tab. 21).

Fig. 17 shows Pearson residuals with respect to the frequency of source frames for all corpora categories. Tab. 22 presents standardized Pearson residuals (Pearson chi-squared test results: $\chi^2 = 896.15$, $df = 50$, $p\text{-value} < 0.0001$, Cramer's $V = 0.207$).

The PERFUME category is characterized by a high frequency of the **HEARING** and **TASTE** source frames and much lower than expected frequency of the **MULTIMODAL PERCEPTION** and **VISION** frames. The **MULTIMODAL PERCEPTION** source frame is preferred, especially in the BEER sub-corpus, but it is also characteristic of the MUSIC, WINE, and YERBA sub-corpora. The

Tab. 19: Source-and-target frames in the WELLNESS category.

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	-2.259	0.485	NaN	0.304	0.381	0.891
TARGET	2.259	-0.485	NaN	-0.304	-0.381	-0.891

Tab. 20: Source-and-target frames in the WINE category.

FRAME	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	12.122	16.592	-7.857	-30.130	14.385	17.404
TARGET	-12.122	-16.592	7.857	30.130	-14.385	-17.404

Tab. 21: Source-and-target frames in the YERBA category.

	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
SOURCE	1.337	5.218	-3.349	-5.537	0.412	5.093
TARGET	-1.337	-5.218	3.349	5.537	-0.412	-5.093

SMELL source frame is the most frequent in the **MUSIC** and **COSMETICS** categories. The **VISION** source frame is very often chosen in the **MUSIC** sub-corpus, but is statistically more frequent in the **CULTURE** and **CUISINE** sub-corpora. The differences in the frequency of the **TOUCH** source frame are not statistically significant.

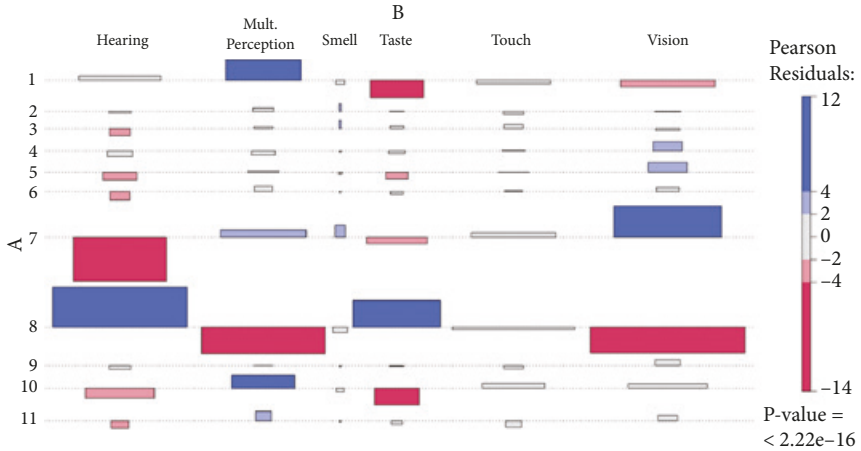


Fig. 17: Pearson residuals of the source frames' frequencies in Synamet's categories: 1) BEER, 2) COFFEE, 3) COSMETICS, 4) CUISINE, 5) CULTURE, 6) MASSAGE, 7) MUSIC, 8) PERFUME, 9) WELLNESS, 10) WINE, 11) YERBA.

Tab. 22: Standardized Pearson residuals for source frames in the text categories in Synamet.

CATEGORY	HEARING	MULT.PERC.	SMELL	TASTE	TOUCH	VISION
1. Beer	1.597	7.718	-1.442	-6.273	-1.351	-2.740
2. Coffee	-0.500	1.174	2.388	0.063	-0.910	-0.083
3. Cosmetics	-2.452	0.702	2.661	0.988	1.563	-0.627
4. Cuisine	-1.986	-1.398	-0.416	-0.937	0.278	3.421
5. Culture	-2.771	0.403	-0.562	-2.287	0.039	3.677
6. Massage	-2.997	1.869	-0.321	-0.943	0.298	1.517
7. Music	-17.335	2.823	4.281	-2.410	1.720	12.993
8. Perfume	18.619	-12.151	-2.272	11.530	-1.188	-12.691
9. Wellness	-1.258	0.014	-0.353	-0.242	-1.043	2.218
10. Wine	-3.659	4.726	-1.181	-5.828	1.744	1.670
11. Yerba	-2.524	3.395	-0.281	-1.162	-2.162	2.006

4.4 Statistics of non-perceptual frames in Synamet

The most frequently used non-perceptual source frames in Synamet (with more than 100 occurrences) are as follows: **ABSTRACT CONCEPTS**,¹⁸ **ARCHITECTURE**, **CLOTHES**, **COOKING**,¹⁹ **CULTURE&ART**,²⁰ **LANGUAGE**, **OBJECT**,²¹ **PERSON**, **PLANT**, and **WEATHER**, as in Fig. 18.

In weak synesthetic metaphors, the most frequent pairs of source and target frames include: **SPORT** (source) → **TASTE** (target), **SPACE** (source) → **HEARING** (target), **OBJECT** (source) → **HEARING** (target), **WEATHER** (source) → **HEARING** (target), **ARCHITECTURE** (source) → **SMELL** (target), **PLANT** (source) → **TASTE** (target), and **PERSON** (source) → **SMELL** (target); see Tab. 23 for standardized Pearson residuals (Pearson chi-squared test results: $\chi^2 = 526.32$, $df = 16$, $p\text{-value} < 0.0001$, Cramer's $V = 0.297$).

The **SMELL** as a target frame interconnects with the largest and most diverse set of source non-perceptual frames—44 frames (e.g., **PERSON**, **OBJECT**, **ARCHITECTURE**, **PLANT**, **CLOTHES**, **ART**, **WILD ANIMAL**, **SPACE**, **WEATHER**, **THE ELEMENTS**, **SOCIETY**, **LANGUAGE**, **HOME**, **ARMY**, **TIME**, **WEATHER**, **BASIN**, **MAGIC**, **MACHINE**, etc.). The next largest target frame, which receives metaphorical transfer from 37 various non-perceptual source frames, is the **HEARING** frame (e.g., **PERSON**, **OBJECT**, **SPACE**, **TRAVEL**, **VEHICLE**, **HEALTH SERVICE**, etc.). A slightly smaller number—27 source frames—appears in synesthetic metaphors with **TASTE** as the target frame (e.g., **PERSON**, **SPORT**, **OBJECT**, **SOCIETY**, **ARMY**, **LANGUAGE**, etc.). By contrast, **VISION** as a target frame occurs in metaphors with only 16 different non-perceptual source frames (e.g., **PERSON**, **PLANT**, **OBJECT**, etc.). **TOUCH** and **MULTIMODAL PERCEPTION** never appear as target frames in weak synesthetic metaphors.

18 The **ABSTRACT CONCEPTS** source frame can be evoked by the lexical items *łatwy* 'simple', *skomplikowany* 'complicated', or *sens* 'sense'.

19 This frame is evoked by lexemes referring to food preparation, e.g., *mieszać* 'stir', *przyprawiać* 'flavor', or *gotować* 'cook'.

20 This frame consists of several sub-frames, including **LITERATURE**, **THEATRE**, **CINEMA**, and **ART**.

21 The **OBJECT** frame is activated by lexemes that indicate a material object in a general way, e.g., *pojemnik* 'container', *część* 'part of something', or *substancja* 'substance'.

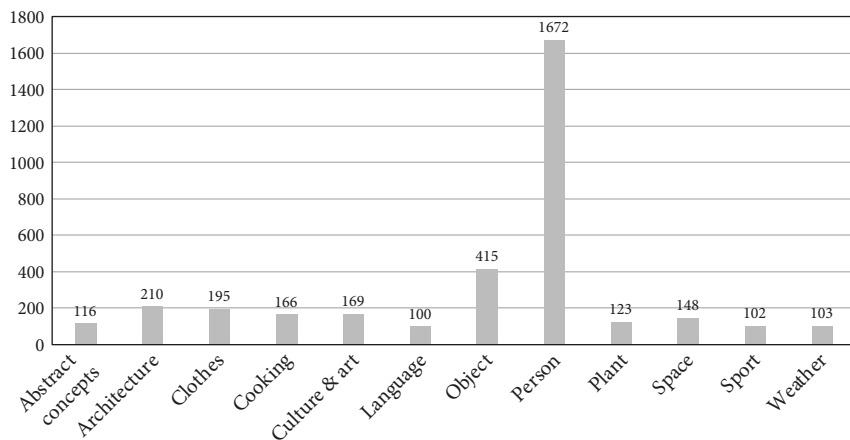


Fig. 18: The most frequent non-perceptual source frames in Synamet.

Tab. 23: Source/target pairs of frames in weak synesthetic metaphors (standardized Pearson residuals, p-value < 0.0001).

<i>Target</i> Source	<i>HEARING</i>	<i>TASTE</i>	<i>SMELL</i>
ARCHITECTURE	-2.818	-4.524	6.266
CULTURE&ART	-0.431	-2.105	2.088
CLOTHES	1.315	-1.351	-0.154
PERSON	-5.118	0.179	4.664
PLANT	-4.640	6.251	-0.640
SPACE	8.063	-4.223	-4.196
SPORT	-6.691	16.449	-6.870
OBJECT	7.229	-2.326	-4.929
WEATHER	6.544	-4.912	-2.218

4.5 Statistics of non-perceptual frames in categories

Likewise, non-perceptual source frames have different frequencies depending on the type of texts gathered in Synamet’s categories. I concentrate here on the sub-corpora, which are the most productive in synesthetic metaphors, i.e., BEER, MUSIC, PERFUME, and WINE. Standardized Pearson residuals (Pearson chi-squared test results: $\chi^2 = 1073.3$, $df = 117$, $p\text{-value} < 0.0001$, Cramer’s $V = 0.301$) show which differences are statistically significant (see Tab. 24).

Tab. 24: Frequency of non-perceptual frames in BEER, MUSIC, PERFUME, and WINE.

	FRAME	BEER	MUSIC	PERFUME	WINE
1	ABSTRACT CONCEPTS	1.498	-2.190	-2.878	6.388
3	ARCHITECTURE	-1.861	-3.603	6.421	-2.918
4	ARMY	2.332	0.411	-2.797	1.647
5	BUILT-UP AREA	-0.699	1.155	-1.087	0.582
6	CLOTHES	-1.302	0.547	-0.340	0.867
7	COOKING	-2.610	5.432	-1.389	-3.626
8	CRIME	-0.938	-1.521	2.035	-0.050
9	CULTURE&ART	1.340	-1.042	1.344	-1.717
10	DOMESTIC ANIMAL	-1.074	-0.995	-0.456	3.144
11	DRUGS	-0.827	0.417	0.694	-0.961
2	EVENT	-0.308	-3.904	5.075	-1.765
12	HAZARD	-0.827	-0.374	0.694	0.217
13	HEALTH SERVICE	0.212	1.687	-0.825	-1.425
14	HOME	-1.629	-1.833	3.922	-1.893
15	HYGIENE	-1.128	-0.925	1.826	-0.445
16	INDUSTRY	-0.766	-0.102	1.112	-0.890
17	JOURNEY	-1.192	5.621	-3.653	-1.661
18	LANGUAGE	1.695	-3.076	2.462	-0.732
19	MACHINE	-1.212	1.461	0.198	-1.408
20	MAGIC	-1.296	0.799	0.713	-1.144
21	MINERALS	-0.437	1.014	-0.734	0.014
22	NATURAL LAND	-0.153	0.818	-0.411	-0.445
23	OBJECT	-3.155	5.958	-3.854	-0.110
24	PERSON	-1.703	-6.644	3.455	6.063
25	PHYSICAL QUANTITIES	0.502	4.883	-3.856	-1.752
26	PLANT	0.852	-3.206	0.259	3.618
27	PLAY	-0.827	2.000	-1.591	0.217
28	POLITICAL SYSTEM	-1.038	0.072	1.305	-1.205
29	RELIGION	0.708	-1.089	-0.095	1.142
30	SOCIETY	-1.684	-0.926	1.082	1.199
31	SPACE	-1.870	7.477	-3.692	-3.765
32	SPORT	22.658	-7.102	-6.407	-3.765
33	THE ELEMENTS	-0.344	0.533	1.339	-2.561
34	TIME	-1.171	-1.649	3.139	-1.361
35	TOOL	-0.153	1.399	-0.411	-1.311
36	TRADE	0.357	0.869	-0.377	-1.028
37	UNIVERSE	-0.884	3.090	-1.803	-1.028

Tab. 24: Continued

	FRAME	BEER	MUSIC	PERFUME	WINE
38	WATER BODY	-1.491	4.272	-2.040	-1.882
39	WEATHER	-2.681	5.959	-1.909	-3.543
40	WILD ANIMAL	2.713	-1.598	0.688	-1.092

In the BEER category, the source frame **SPORT** is characterized by a very high frequency compared to other categories. Moreover, the **WILD ANIMAL**²² source frame is activated more often in the BEER category than in the rest sub-corpora. The MUSIC category exhibits relatively high frequency of source frames: **SPACE**, **OBJECT**, **WEATHER**, **JOURNEY**, **COOKING**, **PHYSICAL QUANTITY**,²³ **BODY OF WATER**, and **UNIVERSE**. In the PERFUME sub-corpus, **ARCHITECTURE**, **EVENT**, **HOME**, **PERSON**, and **TIME** are most frequent as source frames. The WINE category exhibits a more frequent activation of the **ABSTRACT CONCEPT**, **PERSON**, **COOKING**, **PLANT**, and **DOMESTIC ANIMAL** source frames.

4.6 Statistics of frame elements in Synamet

Synamet consists of six perceptual frames and 55 non-perceptual frames. The set of elements evoked in perceptual frames is 204 elements and in non-perceptual frames it is 553 elements. According to the standardized Pearson residuals, a more diversified set of elements exhibits perceptual frames, even though they are rarer than non-perceptual frames (Pearson chi-squared test results: $\chi^2 = 7.7896$, $df = 1$, $p\text{-value} = 0.005255$, Cramer's $V = 0.103$) (see Tab. 25).

4.6.1 Perceptual frame elements in Synamet

Perceptual frames vary with respect to evoking their elements in the analyzed texts. The broadest sets of elements are activated in the **VISION** and **HEARING**

22 There are two different frames in Synamet—**WILD ANIMAL** and **DOMESTIC ANIMAL**. The distinction results from the linguistic data. There are lexical items referring to animal farming (e.g., *rasowy* 'purebred', *owca* 'sheep', and *rzeźnia* 'slaughterhouse') and others that refer to wild animals (e.g., *dziki* 'wild', *drapieżny* 'predatory', and *tygrys* 'tiger').

23 The **PHYSICAL QUANTITIES** frame is evoked by lexemes such as *elektryzujący* 'electrifying', *energia* 'energy', and *napięcie* 'voltage'.

Tab. 25: Standardized Pearson residuals of frames and their elements in Synamet (p-value = 0.005255).

	PERCEPTUAL	NON-PERCEPTUAL
FRAMES	-2.943	2.943
ELEMENTS	2.943	-2.943

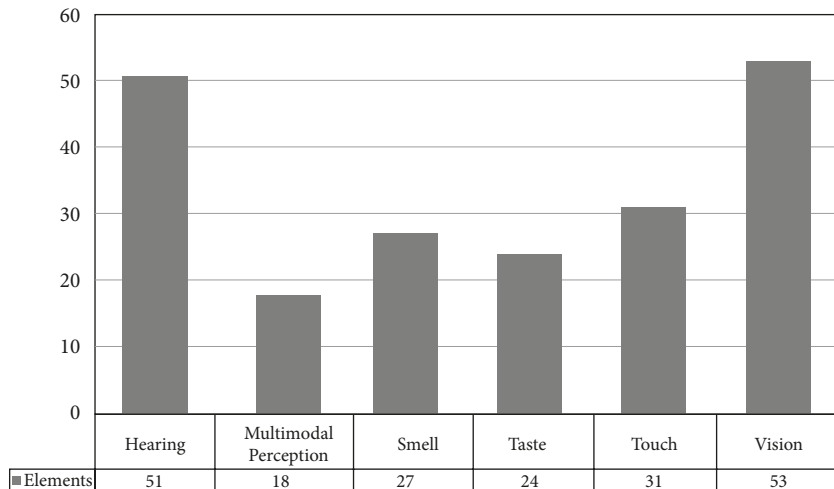


Fig. 19: Perceptual frame elements in Synamet.

frames. The smallest range of elements characterizes the **MULTIMODAL PERCEPTION** frame (see Fig. 19).

The most frequent elements of perceptual source frames in Synamet (with more than 100 occurrences) are *COMPONENT* (the element of the **HEARING** frame, e.g., *nuta* 'note', with 494) and *WEIGHT* (an element of the **MULTIMODAL PERCEPTION** frame, e.g., *ciężki* 'heavy', with 444). Less frequent are *TEMPERATURE* (**TOUCH** frame, e.g., *ciepły* 'warm', with 181), *SIZE* (**VISION** frame, e.g., *wysoki* 'tall', with 176), *COLOR* (**VISION** frame, e.g., *zielony* 'green', with 152), *SUSCEPTIBILITY TO DESTRUCTION* (**TOUCH** frame, e.g., *kruchy* 'brittle', with 142), *COMPOSITION* (**HEARING** frame, e.g., *muzyka* 'music', with 140), *TYPE OF TASTE* (**TASTE** frame, e.g., *słodki* 'sweet', with 129), *TEXTURE* (**TOUCH** frame, e.g., *miękki* 'soft', with 126), *CLEANLINESS* (**VISION** frame, e.g., *czysty* 'clean', with 121), *GROUP OF SOUNDS* (**HEARING** frame, e.g., *akord* 'chord', with 119), and *SENSATION* (**TASTE** frame, e.g., *smak*

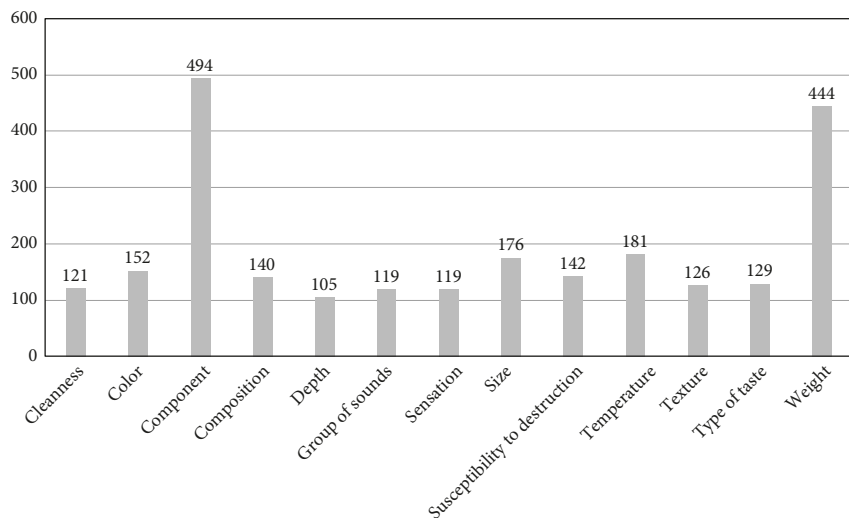


Fig. 20: The most frequent elements of perceptual source frames in Synamet.

‘taste’, with 119), and *DEPTH* (**MULTIMODAL PERCEPTION** frame, e.g., *lekki* ‘light’, with 105) (see Fig. 20).

4.6.2 Non-perceptual frame elements in Synamet

Among non-perceptual frames, the most diversified set of elements are exhibited in the **PERSON** frame. Tab. 26 shows the non-perceptual frames that have at least 10 elements evoked.

In weak synesthetic metaphors, two elements of the non-perceptual source frame **PERSON** exhibit the highest frequency: *BODY PART* (e.g., *serce* ‘heart’) and *STRENGTH* (e.g., *mocny* ‘powerful’). At a slightly lower frequency, but still significant (more than 50 occurrences), we find the following elements: *ACTION OF AGENT* (**SPORT** frame, e.g., *finisz* ‘finish’), *CHARACTER* (**PERSON** frame, e.g., *charakter* ‘character’), *PART OF BUILDING* (**ARCHITECTURE** frame, e.g., *baza* ‘base’), *CONSTRUCTION* (the **ARCHITECTURE** frame, e.g., *konstrukcja* ‘construction’), *BEHAVIOR* (**PERSON** frame, e.g., *agresywny* ‘aggressive’), *PERSONALITY EVALUATION* (**PERSON** frame, e.g., *czarujący* ‘charming’), *POSITIVE CHARACTER TRAIT* (**PERSON** frame, e.g., *skromny* ‘modest’), *POWER* (**PHYSICAL QUANTITIES** frame, e.g., *moc* ‘power’), *OBJECT STATE* (**OBJECT** frame, e.g., *pełny* ‘full’), *FINANCIAL STATUS* (the **PERSON** frame,

Tab. 26: Number of evoked elements in the non-perceptual frames (10 and more elements).

FRAME	NUMBER OF EVOKED ELEMENTS
PERSON	102
CULTURE&ART	47
SOCIETY	35
OBJECT	28
SPACE	24
COOKING	21
THE ELEMENTS	17
CLOTHES	15
LANGUAGE	13
ARMY	13
PLANT	11
JOURNEY	10
TRANSPORT	10

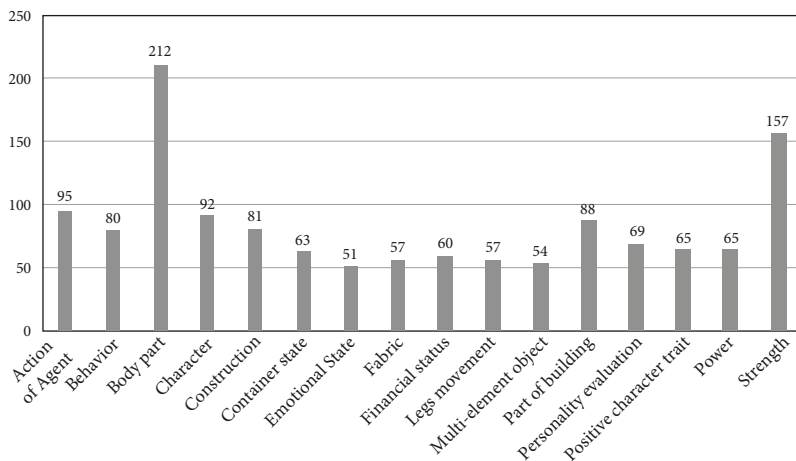


Fig. 21: Elements of non-perceptual source frames in Synamet most frequently evoked in MUs.

e.g., *bogaty* 'rich'), *LEG MOVEMENT* (**PERSON** frame, e.g., *uciekać* 'run'), *FABRIC* (**CLOTHES** frame, e.g., *satyna* 'satin'), *MULTI-ELEMENT OBJECT* (**OBJECT** frame, e.g., *układanka* 'puzzle'), and *EMOTIONAL STATE* (**PERSON** frame, e.g., *spokojny* 'calm') (see Fig. 21).

4.6.3 Pairs of source-and-target frame elements in Synamet

The elements of target perceptual frames connect with a different set of source frames' elements. In this section, I present the most frequent pairs (in 10 or more MUs) in strong and weak synesthetic metaphors.

The ultimate recipient is the **SMELL** frame. It can be interconnected with all other perceptual frames and the most diversified set of their elements. Likewise, the **SMELL** frame exhibits the most unconstrained connectivity with non-perceptual frame elements. Tab. 27 shows pairs of **SMELL** FEs and elements of other perceptual frames, and Tab. 28 presents the connectivity of **SMELL** FEs with the elements of non-perceptual frames.

The next frame, which often serves as a target frame, is **TASTE**. Its elements connect freely with all five perceptual source frames and only four non-perceptual frames (see Tabs 29 and 30).

The **HEARING** frame is much more restricted as a target—it only connects with **MULTIMODAL PERCEPTION** and **VISION** frame elements. Moreover, the **HEARING** frame's connections with elements of non-perceptual frames are rare (see Tabs 31 and 32).

Tab. 27: Pairs of elements of the **SMELL** target frame and the other perceptual frames.

TARGET FRAME ELEMENTS	SOURCE FRAME	ELEMENTS	MUs	
<i>COMPLEX SMELL SENSATION</i>	HEARING	<i>COMPOSITION</i>	95	
		<i>GROUP OF SOUNDS</i>	19	
<i>SMELL PATTERN</i>	HEARING	<i>COMPONENT</i>	13	
<i>SMELL SENSATION</i>	HEARING	<i>COMPONENT</i>	18	
		<i>LOUDNESS</i>	12	
		<i>WEIGHT</i>	33	
	MULTIMODAL PERCEPTION	TASTE	<i>DESIRABLE STATE</i>	11
			<i>TASTE SENSATION</i>	23
			<i>TYPE OF TASTE</i>	29
	TOUCH	TASTE	<i>TEXTURE</i>	13
			<i>TEMPERATURE</i>	27
<i>QUALITY OF TASTE</i>			10	
VISION	VISION	<i>BACKGROUND</i>	14	
		<i>COLOR</i>	23	
		<i>QUALITY OF VISION</i>	10	
		<i>COLOR</i>	14	
		<i>BACKGROUND</i>	20	
<i>TYPE OF SMELL SENSATION</i>	VISION	<i>COLOR</i>	14	
		<i>BACKGROUND</i>	20	

Tab. 28: Pairs of elements of the SMELL frame and elements of the non-perceptual frames.

TARGET FRAME ELEMENTS	SOURCE FRAMES	ELEMENTS	MUs
<i>COMPLEX SMELL SENSATION COMPONENT</i>	PLANT	<i>COLLECTION OF PLANTS</i>	30
	OBJECT	<i>MULTI-ELEMENT OBJECT</i>	12
	PERSON	<i>LEG MOVEMENT</i>	10
		<i>STRENGTH</i>	15
	CLOTHES	<i>AGENT ACTION</i>	12
<i>INITIAL SENSATION</i>	PERSON	<i>BODY PART</i>	74
	OBJECT	<i>AGENT ACTION</i>	20
<i>LAST SENSATION</i>	ARCHITECTURE	<i>PART OF BUILDING</i>	69
		<i>CONSTRUCTION</i>	38
<i>MIDDLE SENSATION</i>	PERSON	<i>BODY PART</i>	85
<i>OBJECT OF PERCEPTION</i>	PERSON	<i>SEXUAL CHARACTERISTIC</i>	12
		<i>POSITIVE CHARACTER TRAIT</i>	10
		<i>CHARACTER</i>	12
		<i>PERSONALITY</i>	17
		<i>EVALUATION</i>	
		<i>SEX</i>	14
		<i>STRENGTH</i>	13
		<i>BEHAVIOR</i>	10
	MAGIC	<i>AGENT ACTION</i>	10
	CLOTHES	<i>SUBJECT ACTION</i>	18
<i>SMELL SENSATION</i>	PERSON	<i>SEXUAL CHARACTERISTIC</i>	10
		<i>POSITIVE CHARACTER TRAIT</i>	11
		<i>BODY PART</i>	10
		<i>PERSONALITY</i>	12
		<i>EVALUATION</i>	
		<i>STRENGTH</i>	11
		<i>BEHAVIOR</i>	11
<i>TYPE OF SMELL</i>	PERSON	<i>STRENGTH</i>	12

The **VISION** frame is never a target frame in weak synesthetic metaphors. In strong synesthetic metaphors, the elements of the **VISION** frame can connect only with elements of the **MULTIMODAL PERCEPTION** and **TOUCH** frames (see Tab. 33).

Tab. 29: Pairs of elements of the TASTE target frame and the other perceptual frame elements.

ELEMENT OF TARGET FRAME	SOURCE FRAME	ELEMENT	MUs	
<i>OBJECT OF PERCEPTION</i>	TOUCH	<i>TEXTURE</i>	22	
		<i>SUSCEPTIBILITY TO DESTRUCTION</i>	13	
<i>TASTE COMPONENT</i>	MULTIMODAL PERCEPTION	<i>WEIGHT</i>	49	
		<i>BALANCE</i>	13	
	HEARING	<i>AGENT ACTION COMPONENT</i>	11	
		<i>GROUP OF SOUNDS</i>	25	
		<i>WEIGHT</i>	30	
	MULTIMODAL PERCEPTION	<i>WEIGHT</i>	23	
		VISION	<i>SIZE</i>	15
			<i>CHANGE OF OBJECT'S STATE</i>	19
		TOUCH	<i>TEXTURE</i>	13
	HEARING		<i>COMPONENT</i>	21
MULTIMODAL PERCEPTION		<i>GROUP OF SOUNDS</i>	18	
	TOUCH	<i>WEIGHT</i>	44	
VISION		<i>TEXTURE</i>	24	
	VISION	<i>SIZE</i>	10	
VISION		<i>CHANGE OF OBJECT'S STATE</i>	12	
	<i>TYPE OF TASTE</i>	HEARING	<i>COMPONENT</i>	13
MULTIMODAL PERCEPTION			<i>WEIGHT</i>	28
		VISION	<i>SIZE</i>	11

The **MULTIMODAL PERCEPTION** and **TOUCH** frames are rarely target frames in either strong or weak metaphors. Pairs of these frames occur in MUs occasionally.

4.6.4 Statistics of source frame elements in the categories with the highest rate of MUs

The patterns of a particular frame element activation vary depending on the category of texts. The largest set of perceptual and non-perceptual

Tab. 30: Pairs of elements of the TASTE frame and elements of the non-perceptual frames.

ELEMENTS OF TARGET FRAME	SOURCE FRAME	ELEMENTS	MUs
<i>OBJECT OF PERCEPTION</i>	ABSTRACT CONCEPTS	<i>EVALUATION</i>	12
	CLOTHES	<i>EVALUATION OF APPEARANCE</i>	10
	PERSON	<i>AGE</i>	17
		<i>BEHAVIOR</i>	15
		<i>BODY-BUILD</i>	10
		<i>CHARACTER</i>	24
		<i>STRENGTH</i>	18
<i>TASTE COMPONENT</i>	PERSON	<i>STRENGTH</i>	10
<i>TASTE SENSATION</i>	SPORT	<i>AGENT ACTION</i>	66
<i>TYPE OF TASTE</i>	PERSON	<i>STRENGTH</i>	15
	SPORT	<i>AGENT ACTION</i>	12

Tab. 31: Pairs of elements of the HEARING target frame and the other perceptual frame elements.

TARGET FRAME ELEMENTS	SOURCE FRAME	ELEMENTS	MUs
<i>COMPOSITION</i>	MULTIMODAL PERCEPTION	<i>WEIGHT</i>	10
<i>INSTRUMENT</i>	VISION	<i>BACKGROUND</i>	11
<i>MUSIC GENRE</i>	MULTIMODAL PERCEPTION	<i>WEIGHT</i>	13
<i>MUSICAL WORK</i>	MULTIMODAL PERCEPTION	<i>WEIGHT</i>	21
<i>SOUND</i>	VISION	<i>SIZE</i>	11
<i>TYPE OF SOUND</i>	VISION	<i>COLOR</i>	11

FEs is activated in the PERFUME category (139 and 386, respectively), a slightly smaller set in MUSIC (108 and 349, respectively), and a much more restricted set in both WINE (81 and 156, respectively), and BEER (58 and 99, respectively). The chi-squared test results are $\chi^2 = 15.623$, $df = 3$, $p\text{-value} = 0.001355$, Cramer's $V = 0.107$. The standardized Pearson residuals are presented in Tab. 34. The proportion of perceptual vs. non-perceptual frame element activation is only statistically significant for BEER (predominance of perceptual elements) and MUSIC (predominance of non-perceptual elements) categories.

Tab. 32: Pairs of elements of the HEARING frame and elements of the non-perceptual frames.

TARGET FRAME ELEMENTS	SOURCE FRAME	ELEMENT	MUs
<i>COMPOSITION</i>	ARCHITECTURE	<i>CONSTRUCTION</i>	10
	CLOTHES	<i>FABRIC</i>	18
	OBJECT	<i>MULTI-ELEMENT OBJECT</i>	11
<i>COLLECION OF MUSICAL WORKS</i>	CLOTHES	<i>FABRIC</i>	12
<i>MUSIC GENRE</i>	WEATHER	<i>CLIMATE</i>	14
<i>MUSICAL WORK</i>	OBJECT	<i>PART OF OBJECT</i>	31
	WEATHER	<i>CLIMATE</i>	12

Tab. 33: Pairs of elements of the VISION target frame and the other perceptual frame elements.

TARGET FRAME	SOURCE FRAME	ELEMENT	MUs
<i>COLOR</i>	MULTIMODAL PERCEPTION	<i>DEPTH</i>	20
	TOUCH	<i>TEMPERATURE</i>	10

Tab. 34: Standardized Pearson residuals for activation of source perceptual and non-perceptual frame elements in WINE, BEER, MUSIC, and PERFUME categories (p-value < 001).

FRAME ELEMENTS	BEER	MUSIC	PERFUME	WINE
<i>PERCEPTUAL</i>	2.634	-2.573	-1.022	2.316
<i>NON-PERCEPTUAL</i>	-2.634	2.573	1.022	-2.306

4.6.4.1 Perceptual source frame elements in the categories with the highest rate of MUs

The **HEARING**²⁴ source FEs are evoked by lexical items in the MUs of the BEER, PERFUME, and WINE categories. There are statistically significant differences between those categories (Pearson chi-squared test results: $\chi^2 = 218.41$, $df = 28$, p-value < 0.0001, Cramer’s V = 0.346). In the PERFUME category, as many as 11 elements of the **HEARING** frame were activated, whereas only six were used in the wine or BEER categories. The BEER category frequently evokes the *GROUP*

24 The **HEARING** frame and its elements are targets in the MUSIC category.

OF SOUNDS (e.g., *akord*, ‘chord’), PERFORMER’S ACTION (e.g., *grać* ‘to play’, *śpiewać* ‘to sing’), and STATE OF SOUND SOURCE (e.g., *brzmieć* ‘to sound’) elements. The PERFUME sub-corpus is characterized by the highest frequency of MUs activating the COMPOSITION (e.g., *kompozycja* ‘composition’, *muzyka* ‘music’) and LOUDNESS (e.g., *głośność* ‘volume’) elements. In the WINE category, the most frequently evoked elements are the GROUP OF PERFORMERS (e.g., *kwartet* ‘quartet’) and the TURNING VOLUME UP/DOWN (e.g., *wyciszony* ‘muted’) (see Tab. 35).

MULTIMODAL PERCEPTION source FEs are evoked in all four of the most productive sub-corpora and some of the differences between categories are statistically significant (Pearson chi-squared test results: $\chi^2 = 81.332$, $df = 24$, $p\text{-value} < 0.0001$, Cramer’s $V = 0.198$). The **MULTIMODAL PERCEPTION** frame exhibits less diversity of activated elements in the analyzed categories. In wine metaphors, seven elements are used, in the BEER and MUSIC categories, 10 elements are used, and nine elements are employed in the PERFUME category. In the BEER category, the most frequently used is the *EQUILIBIUM STATE* element (e.g., *zbalansowany* ‘balanced’). The MUSIC category exhibits the frequent evocation of *AGENT ACTION* (e.g., *pogłębiać* ‘to deepen’), *MASSIVENESS*

Tab. 35: The HEARING frame elements evoked in texts gathered in the BEER, PERFUME, and WINE categories.

FRAME ELEMENT	BEER	PERFUME	WINE
CHANGE OF SOUND SOURCE’S STATE	-1.128	1.397	-0.651
COMPONENT	-2.804	0.999	2.526
COMPOSER’S ACTION	-0.216	-0.292	0.813
COMPOSITION	-6.101	6.602	-1.920
GROUP OF PERFORMERS	-0.011	-1.598	2.693
GROUP OF SOUNDS	5.802	-3.664	-2.552
LOUDNESS	-2.802	3.059	-0.926
MUSICAL WORK	-0.011	0.399	-0.651
PERFORMER’S ACTION	9.548	-8.270	-0.448
SOUND	0.588	-1.973	2.424
SOUND SENSATION	-1.754	2.174	-1.013
STATE OF SOUND SOURCE	2.887	-1.632	-1.591
STYLE OF PERFORMANCE	-1.336	-0.034	2.058
TURNING VOLUME UP/DOWN	-0.682	-1.104	2.872
TYPE OF SOUND	-0.807	0.565	0.261

Tab. 36: The MULTIMODAL PERCEPTION frame elements evoked in texts gathered in the BEER, MUSIC, PERFUME, and WINE categories.

FRAME ELEMENT	BEER	MUSIC	PERFUME	WINE
AGENT ACTION	0.017	2.702	-1.604	-1.265
CONSISTENCY	-3.006	0.508	2.327	0.256
CONVEXITY	-0.484	-0.755	1.531	-0.324
DEPTH	-1.958	-0.529	0.546	2.252
EQUILIBRIUM STATE	3.593	-1.659	-3.101	1.254
MASSIVENESS	0.749	2.829	-2.955	-0.721
OBJECT'S STATE	-2.430	3.725	-0.303	-1.072
SHAPE	-1.547	1.855	-0.792	0.587
WEIGHT	1.514	-2.299	1.949	-1.363

(e.g., *solidny* 'solid'), and *OBJECT'S STATE* (e.g., *zwięwny* 'airy') elements (see Tab. 36).

Likewise, the **TASTE** source FEs are evoked by all sub-corpora, even the BEER and WINE category (in the case when metaphor targets are smell or an appearance of a drink). The Pearson chi-squared test result for the computation of evoking **TASTE** FEs are $\chi^2 = 78.503$, $df = 21$, $p\text{-value} < 0.0001$, Cramer's $V = 0.264$. In the MUSIC category, 16 elements of the **TASTE** frame are activated, in the PERFUME category, 15 elements are activated, while the WINE category evokes six **TASTE** FEs, and in the BEER category, only three elements are evoked. In the metaphors with the MUSIC category as a source, the *TASTE EVALUATION* element (e.g., *smaczny* 'tasty') is most often evoked. The PERFUME category exhibits the highest frequency of activation of the *TYPE OF TASTE* element (e.g., *słodki* 'sweet'), and the WINE category most often activates the *UNDESIRABLE STATE OF OBJECT OF PERCEPTION* element (e.g., *niedojrzały* 'unripe') (see Tab. 37).

TOUCH source FEs are common in metaphors in all four categories, but there are quite a few important differences (Pearson chi-squared test results: $\chi^2 = 325.13$, $df = 42$, $p\text{-value} < 0.0001$, Cramer's $V = 0.39$). As far as the **TOUCH** frame is concerned, seven elements of the **TOUCH** frame are activated in the BEER category, while 12 elements are activated in the wine discourse, and 14 elements are activated in both the MUSIC and PERFUME categories. The BEER category exhibits the highest rate of activating the *SUSCEPTIBILITY TO DESTRUCTION* (e.g., *kruchy* 'brittle') and *PATTERN OF SENSATION* (e.g., *jedwab* 'silk') elements. The PERFUME category is characterized by the highest

Tab. 37: The TASTE frame elements evoked in texts gathered in the BEER, MUSIC, PERFUME, and WINE categories.

FRAME ELEMENT	BEER	MUSIC	PERFUME	WINE
<i>DESIRABLE STATE OF OBJECT OF PERCEPTION</i>	-1.741	1.575	-0.600	0.424
<i>INTENSITY OF TASTE</i>	0.499	-0.675	0.570	-0.637
<i>OBJECT OF PERCEPTION</i>	-0.822	-0.675	0.570	1.037
<i>TASTE EVALUATION</i>	-1.233	4.546	-2.803	-0.954
<i>TASTE SENSATION</i>	2.175	0.933	-2.034	0.301
<i>TYPE OF OBJECT OF PERCEPTION</i>	-1.030	0.119	0.757	-0.797
<i>TYPE OF TASTE</i>	0.572	-4.844	4.212	-1.042
<i>UNDESIRABLE STATE OF OBJECT OF PERCEPTION</i>	-0.553	2.547	-3.678	4.455

Tab. 38: The TOUCH frame elements evoked in texts gathered in the BEER, MUSIC, PERFUME, and WINE categories.

FRAME ELEMENT	BEER	MUSIC	PERFUME	WINE
<i>TEXTURE</i>	2.174	-3.361	-3.167	6.385
<i>STICKINESS</i>	-0.136	-2.459	2.483	-0.430
<i>CONTACT WITH A WHOLE BODY</i>	-1.858	0.450	0.450	-1.038
<i>OBJECT OF PERCEPTION</i>	-1.305	-0.080	-0.153	1.692
<i>SUSCEPTIBILITY TO FLECTION</i>	-2.701	0.543	0.209	1.876
<i>SUSCEPTIBILITY TO DESTRUCTION</i>	9.798	-0.947	-6.356	0.010
<i>TEMPERATURE</i>	-6.087	-0.469	7.495	-3.825
<i>MOISTURE CONTENT</i>	-2.925	-0.386	1.828	0.914
<i>PATTERN OF SENSATION</i>	5.949	-2.138	-2.896	0.526
<i>SHARPNESS</i>	-3.255	5.725	-0.679	-2.591
<i>CHANGE OF SURFACE</i>	-0.976	0.307	1.021	-0.820
<i>CHANGE OF OBJECT'S STATE</i>	-1.377	-1.757	2.107	0.558
<i>CHANGE OF OBJECT'S STATE BY SUBJECT</i>	-0.384	1.505	-0.153	-1.214
<i>CHANGE OF STRUCTURE</i>	-0.052	3.745	-1.686	-2.089
<i>CHANGE OF TEMPERATURE</i>	-1.305	1.505	0.519	-1.214

frequency of the *TEMPERATURE* source frame element (e.g., *ciepły* 'warm') and the WINE category is characterized by the highest frequency of the *TEXTURE* element (e.g., *gładki* 'smooth') (see Tab. 38).

The most diverse set of elements is evoked in the **VISION** source frame, and there are quite a lot of statistically significant differences between the categories (Pearson chi-squared test results: $\chi^2 = 588.38$, $df = 90$, $p\text{-value} < 0.0001$, Cramer's $V = 0.41$). Twenty-five elements of the **VISION** frame are activated in wine metaphors, while 29 elements are used in both **MUSIC** and **PERFUME** categories, and only 18 elements are used in the **BEER** category. In the **BEER** category, the highest rate of evoked elements are found with the *CHANGE OF OBJECT STATE* (*pojawić się* 'to appear'), *CONTOUR* (e.g., *profil* 'profile'), *OBJECT'S STATE* (e.g., *widnieć* 'to be visible'), and *SIZE* (e.g., *duży* 'big') elements. The **MUSIC** category is characterized by the highest frequency of the *CLEANLINESS* (e.g., *brudny* 'dirty') and *LACK OF LIGHT* (e.g., *mroczny* 'obscure') elements. In the **PERFUME** category, the most often evoked are the *COLOR* (e.g., *zielony* 'green'), *LIGHT* (e.g., *blask* 'brightness'), *LUSTER* (e.g., *połyskujący* 'shimmering'), *REMOVAL OF BARRIER* (e.g., *odsłonić* 'to reveal'), *SOURCE OF LIGHT* (e.g., *słońce* 'sun'), and *TRANSPARENCY* (e.g., *przezroczysty* 'transparent') elements. The **WINE** category exhibits the highest frequency of the *LENGTH* (e.g., *długi* 'long'), *SHADOW* (e.g., *cień* 'shadow'), and *SIZE* (e.g., *wysoki* 'tall') elements (see Tab. 39).

4.6.4.2 *Non-perceptual source frame elements in the categories with the highest rate of MUs*

The activation of elements of non-perceptual source frames in the analyzed sub-corpora displays even more diversity. Except for the **PERSON** frame, no elements of other non-perceptual source frames are shared by metaphors in **WINE**, **BEER**, **MUSIC**, and **PERFUME** categories. In this section, I present the most frequent non-perceptual source FEs (evoked five or more times in MUs) in the categories with the highest rate of MUs.

The texts gathered in the **BEER** category most often evoke in MUs the *AGENT'S ACTION* (**SPORT** frame, e.g., *finisz* 'finish'), *STRENGTH* (**PERSON** frame, e.g., *silny* 'powerful'), and *LEG MOVEMENT* (**PERSON** frame, e.g., *wychodzić* 'to come out') elements (see Tab. 40).

The **MUSIC** category exhibits a strong preference in evoking the *BEHAVIOR* (**PERSON** frame, e.g., *agresywny* 'aggressive'), *STATE OF OBJECT* and *PART* (**OBJECT** frame, e.g., *pusty* 'empty', *kawałek* 'part'), and *FABRIC* (**CLOTHES** frame, e.g., *material* 'fabric') elements (see Tab. 41).

In the **PERFUME** category, the most frequently evoked frame element is the *BODY PART* element (**PERSON** frame, e.g., *serce* 'heart'). The next relatively frequent elements in the perfumery discourse are the *PART OF BUILDING*

Tab. 39: The VISION frame elements evoked in MUs of the BEER, MUSIC, PERFUME, and WINE categories.

FRAME ELEMENT	BEER	MUSIC	PERFUME	WINE
BACKGROUND	8.101	-2.915	-2.750	-0.792
BARRIER	-1.242	-1.385	1.722	0.878
BARRIER'S STATE	-0.999	-0.752	0.511	1.392
CHANGE OF COLOR	-0.561	0.428	0.236	-0.318
CHANGE OF LIGHT'S STATE	-1.390	0.269	1.759	-1.292
CHANGE OF OBJECT'S STATE	8.302	-4.149	-0.430	-2.450
CLEANNES	-2.437	4.921	-2.698	-0.542
COLOR	-5.321	-0.936	7.764	-3.633
CONTOUR	5.774	-2.491	-1.812	-0.196
EVALUATION OF OBJECT OF PERCEPTION	-2.590	0.647	0.556	1.082
ILLUMINANCE	-0.011	0.428	0.236	-0.897
INTENSITY OF COLOR	-2.294	-0.568	1.799	0.757
LACK OF LIGHT	-2.336	6.204	-2.331	-2.909
LENGTH	2.219	-3.299	-3.895	7.478
LIGHT	-2.120	-0.115	2.773	-1.367
LIGHT'S STATE	-1.524	-0.793	2.420	-0.585
LOCATION OF OBJECT	2.348	-0.917	0.315	-1.638
LUSTER	-1.647	-1.137	2.995	-0.761
OBJECT OF PERCEPTION	-1.988	1.746	1.729	-2.651
OBJECT'S STATE	4.008	0.162	-2.664	-0.832
OBJECT'S STRUCTURE	-0.525	1.593	-0.925	-0.382
QUALITY OF VISION	-1.037	-1.618	1.433	1.374
REMOVAL OF BARRIER	-1.424	-2.085	3.214	0.011
SHADOW	-1.871	-1.716	-0.041	4.385
SHAPE	-1.847	0.966	-0.906	1.845
SIZE	3.259	2.117	-7.512	3.838
SOURCE OF LIGHT	-1.458	-1.863	2.743	0.380
TRANSPARENCY	-2.024	-0.250	2.748	-1.250
VIEW	-1.161	1.963	-0.292	-1.079
WIDTH	-1.763	1.705	-1.812	1.967

and CONSTRUCTION (**ARCHITECTURE** frame, e.g., *baza* 'base', *konstrukcja* 'construction') and EMOTIONAL STATE (**PERSON** frame, e.g., *smutny* 'sad') elements (see Tab. 42).

Tab. 40: Elements of non-perceptual frames evoked in the MUs of the BEER category.

FRAME	ELEMENT	MUs
ARCHITECTURE	AGENT'S ACTION (e.g., <i>budować</i> 'to build')	5
ARMY	AGENT'S ACTION (e.g., <i>atakować</i> 'to attack')	6
CULTURE&ART	PERSPECTIVE	9
CLOTHES	AGENT'S ACTION (e.g., <i>szyc</i> 'to sew')	9
LANGUAGE	CHARACTERISTICS	9
OBJECT	STATE OF OBJECT	9
PERSON	AGE	6
	BEHAVIOR	5
	CHARACTER	6
	FINANCIAL STATUS	9
	HOSTILE ACTION (e.g., <i>bić</i> 'to beat')	6
	LEG(S) MOVEMENT	22
	STRENGTH	41
PHYSICAL QUANTITIES	WHOLE BODY MOVEMENT	6
	POWER	8
PLANT	COLLECTION OF PLANTS	5
	PLANT FEATURE	5
SPORT	AGENT'S ACTION	72
WILD ANIMAL	ANIMAL FEATURE	8

The WINE category is characterized by a high frequency of the *STRENGTH*, *CHARACTER*, and *BEHAVIOR* (**PERSON** frame, e.g., *silny* 'powerful', *ambitny* 'ambitious', *agresywny* 'aggressive') elements (see Tab. 43).

4.7 Verbal synesthesia from the perspective of frame semantics

This section sums up the results of statistical analysis of perceptual and non-perceptual frames and their elements. The following discussion addresses three key themes: the problem of the universality of the verbal synesthesia hierarchy, embodiment in synesthetic metaphors, and the frame-internal structure's impact on source-to-target mappings.

4.7.1 Model of verbal synesthesia in Synamet

The existing literature on verbal synesthesia focuses particularly on models of cross-modal transfer from source to targets (Classens 1993; Day 1996; Dunag

Tab. 41: Elements of non-perceptual frames evoked in the MUs of the MUSIC category.

FRAME	ELEMENT	MUs
ARCHITECTURE	<i>AGENT 'S ACTION</i>	17
	<i>CONSTRUCTION</i>	20
	<i>EVALUATION OF CONSTRUCTION</i>	7
ARMY	<i>AGENT'S ACTION</i>	12
	<i>INSTRUMENT</i>	11
BODY OF WATER	<i>ACTION</i>	5
	<i>PHENOMENON</i>	9
	<i>STATE</i>	6
CLOTHES	<i>AGENT'S ACTION</i>	11
	<i>FABRIC</i>	45
COOKING	<i>FOOD PREPARATION</i>	16
	<i>FOOD SERVING</i>	11
	<i>INGRIDIENT</i>	5
	<i>STATE OF FOOD</i>	13
COSMOS	<i>PLACE</i>	5
ELEMENTS	<i>STATE</i>	5
HEALTH SERVICE	<i>DOSE</i>	11
JOURNEY	<i>AGENT'S ACTION</i>	8
	<i>DESTINATION</i>	8
	<i>JOURNEY</i>	16
	<i>ROUTE</i>	11
MAGIC	<i>AGENT 'S ACTION</i>	5
	<i>MAGIC</i>	9
OBJECT	<i>AGENT'S ACTION</i>	17
	<i>ARTEFACT</i>	8
	<i>CHANGE OF OBJECT'S STATE</i>	6
	<i>COLLECTION OF SUBSTANCES</i>	7
	<i>LAYER</i>	17
	<i>MULTI-ELEMENT OBJECT</i>	20
	<i>PART</i>	45
<i>STATE OF OBJECT</i>	49	
PERSON	<i>AGE</i>	6
	<i>BEHVIOR</i>	61
	<i>BIOLOGICAL STATE</i>	8
	<i>BODY-BUILD</i>	5
	<i>BODY PART</i>	9

Tab. 41: Continued

FRAME	ELEMENT	MUs
	<i>CHARACTER</i>	29
	<i>CHARACTER TRAIT-NEGATIVE</i>	20
	<i>CHARACTER TRAIT-POSITIVE</i>	18
	<i>EMOTIONAL STATE</i>	29
	<i>EVALUATION OF BODY</i>	7
	<i>EVALUATION OF PERSONALITY</i>	19
	<i>EXPRESSING OF EMOTIONS</i>	6
	<i>FINANCIAL STATE</i>	15
	<i>HAND(S) MOVEMENT</i>	38
	<i>HOSTILE ACTION</i>	25
	<i>INTELLIGENCE</i>	5
	<i>LEG(S) MOVEMENT</i>	23
	<i>MENTAL STATE</i>	10
	<i>MOOD</i>	9
	<i>SOUL</i>	6
	<i>STRENGTH</i>	31
	<i>WHOLE BODY MOVEMENT</i>	18
PHYSICAL QUANTITIES	<i>ENERGY</i>	14
	<i>POWER</i>	35
PLANT	<i>STATE</i>	11
SPACE	<i>PLACE</i>	14
	<i>SPACE</i>	22
	<i>SPACE FEATURE</i>	17
TRANSPORT	<i>ACTION OF VEHICLE</i>	7
WEATHER	<i>CLIMATE</i>	43
	<i>PHENOMENON</i>	9
WILD ANIMAL	<i>ANIMAL'S ACTION</i>	9
	<i>ANIMAL'S FEATURE</i>	10

and Gao 2014; Shen 1997; Shen and Cohen 1998; Tsur 1992; Ullmann 1957; Viberg 1984; Williams 1976; Yu 2003). Ullmann (1957) proposes that the transfer goes from so-called *lower* (touch, taste, smell) to *higher* (hearing and sight) sensory modalities: Touch/Heat → Taste/Scnt → Sight → Sound. He observes that touch is the ultimate source of transfers, and sight and hearing are the main targets. According to Ullmann, the prevalence of hearing as the target, over sight, is due to the fact that the lexical field of visual perception is more complex

Tab. 42: Elements of non-perceptual frames evoked in the MUs of the PERFUME category.

FRAME	ELEMENT	MUs
ABSTRACT CONCEPTS	<i>FEATURE</i>	6
ARCHITECTURE	<i>CONSTRUCTON</i>	49
	<i>PART OF BULIDING</i>	81
ARMY	<i>ARMY</i>	5
BODY OF WATER	<i>BODY OF WATER</i>	5
CLOTHES	<i>ACCESSORIES</i>	13
	<i>AGENT'S ACTION</i>	8
	<i>CLOTHES</i>	5
	<i>EVALUATION OF SUBJECT</i>	10
	<i>FABRIC</i>	7
	<i>FEATURE OF CLOTHES</i>	6
	<i>SUBIECT'S ACTION</i>	27
	<i>TYPE OF CLOTHES</i>	8
COOKING	<i>DISH</i>	6
	<i>FOOD SERVING</i>	6
	<i>INGRIDIENT</i>	7
	<i>STATE OF FOOD</i>	5
	<i>FOOD PREPARATION</i>	25
CRIME	<i>PREPETRATOR</i>	5
CULTURE&ART	<i>AGENT'S ACTION</i>	7
	<i>CONTENT</i>	9
	<i>NOVEL</i>	5
	<i>PERFORMANCE</i>	6
	<i>PICTURE</i>	5
	<i>PROJECTION</i>	6
	<i>ROLE</i>	5
EVENT	<i>EVENT</i>	18
HEALTH SERVICE	<i>DOSE</i>	6
HOME	<i>DECORATION</i>	5
	<i>FEATURE OF HOME</i>	9
	<i>ROOM</i>	6
HYGIENE	<i>COSMETIC</i>	7
JOURNEY	<i>AGENT'S ACTION</i>	7
LANGUAGE	<i>AGENT'S ACTION</i>	8
	<i>CHARACTERISTICS</i>	10
	<i>TOPIC</i>	7
	<i>TYPE OF INFORMATION</i>	11

Tab. 42: Continued

FRAME	ELEMENT	MUs
MAGIC	<i>AGENT'S ACTION</i>	10
	<i>MAGIC</i>	5
OBJECT	<i>CHANGE OF OBJECT'S STATE</i>	9
	<i>LAYER</i>	13
	<i>MULTI-ELEMENT OBJECT</i>	27
	<i>OBJECT'S STATE</i>	15
PERSON	<i>AGE</i>	9
	<i>BEHAVIOR</i>	71
	<i>BIOLOGICAL STATE</i>	24
	<i>BODY</i>	5
	<i>BODY MOVEMENT</i>	15
	<i>BODY PART</i>	195
	<i>BODY-BUILD</i>	5
	<i>BRETHING</i>	8
	<i>CHARACTER</i>	32
	<i>EMOTIONAL STATE</i>	46
	<i>EVALUATION OF BODY</i>	20
	<i>EVALUATION OF PERSONALITY</i>	37
	<i>FINANCIAL STATUS</i>	22
	<i>HAND(S) MOVEMENT</i>	57
	<i>HOSTILE ACTION</i>	13
	<i>INTELLIGENCE</i>	7
	<i>LEG(S) MOVEMENT</i>	13
	<i>MENTAL STATE</i>	5
	<i>MORALITY</i>	5
	<i>NEGATIVE CHARACTER TRAIT</i>	13
	<i>POSITIVE CHARACTER TRAIT</i>	35
	<i>SEX</i>	29
<i>SEXUAL CHARACTERISTIC</i>	36	
<i>STRENGTH</i>	40	
PHYSICAL QUANTITIES	<i>POWER</i>	16
PLANT	<i>CHANGE OF PLANT'S STATE</i>	19
	<i>COLLECTION OF PLANTS</i>	19
	<i>PART OF PLANT</i>	5
	<i>PLANT</i>	6

(continued on next page)

Tab. 42: Continued

FRAME	ELEMENT	MUs
	<i>PLANT COMMUNITY</i>	5
SPACE	<i>DISTANCE</i>	5
	<i>PLACE</i>	11
SPORT	<i>AGENT'S ACTION</i>	10
THE ELEMENTS	<i>FEATURE OF THE ELEMENT</i>	6
	<i>STATE</i>	10
TIME	<i>BEGINNING</i>	25
WEATHER	<i>CLIMATE</i>	6
	<i>PHENOMENON</i>	19
WILD ANIMAL	<i>ANIMAL</i>	5
	<i>ANIMAL'S ACTION</i>	11
	<i>ANIMAL'S FEATURE</i>	14
	<i>PART OF ANIMAL</i>	12

and contains more lexical items: “Of the two sensory domains at the top end of the scale, sound stands more in need of external support than light, form, or colour; hence the greater frequency of the intrusion of outside elements into the description of acoustic phenomena” (Ullmann 1957: 283). Although the analysis of many scholars essentially proves Ullmann’s claim about the universality of lower-to-higher modality transfer (Shen 1997; Shen and Cohen 1998; Tsur 1992; Viberg 1984; Williams 1976), Viberg’s model of verbal synesthesia is opposite to Ullmann’s. Viberg (1984; 1993) proposes that transfer is as follows: SEE → HEAR → FEEL → TASTE, SMELL. Strik Lievers (2015) tries to find an explanation for this obvious contradiction—she claims that, even though Ullmann’s and Viberg’s models differ, they “relate to the same extra-linguistic factors. Underlying both hierarchies is the dominance, in human perception, of sight (and secondarily hearing) over the other sensory modalities” (86). Likewise, Strik Lievers’ (2015: 81) corpus-based research in English and Italian on perceptual lexicon (nouns, verbs, and adjectives) supports Ullmann’s hypothesis—she notes that touch is the most frequent source (49.3 % in English and 55.6 % in Italian of the analyzed instances) and both hearing and sight are the most frequent targets (hearing is the target 52.3 % of the time in English and 50.2 % in Italian, and sight is the target 28 % of the time in English and 42.5 % in Italian of the analyzed instances). She notes that hearing is the sense that attracts the most transfers, from senses both lower and higher in the hierarchy (similar to Ullmann’s model). Strik Lievers (2015) hypothesizes:

Tab. 43: Elements of non-perceptual frames evoked in the MUs of the WINE category.

FRAME	ELEMENT	MUs
ABSTRACT CONCEPT	<i>FEATURE</i>	14
ARCHITECTURE	<i>CONSTRUCTION</i>	8
ARMY	<i>AGENT'S ACTION</i>	8
CLOTHES	<i>EVALUATIN OF SUBJECT</i>	14
	<i>FABRIC</i>	5
CULTURE&ART	<i>CONTENT</i>	5
OBJECT	<i>END PART</i>	14
	<i>MULTI-ELEMENT OBJECT</i>	7
	<i>STATE OF OBJECT</i>	13
PERSON	<i>AGE</i>	15
	<i>BEHAVIOR</i>	24
	<i>BIOLOGICAL STATE</i>	5
	<i>BODY</i>	17
	<i>BODY FEATURE</i>	14
	<i>BODY PART</i>	6
	<i>BODY-BUILD</i>	19
	<i>CHARACTER</i>	26
	<i>CORPULENCE</i>	9
	<i>EMOTIONAL STATE</i>	6
	<i>EVALUATIN OF PERSONALITY</i>	13
	<i>EVALUATION OF BODY</i>	15
	<i>FINANCIAL STATUS</i>	14
	<i>LEG(S) MOVEMENT</i>	5
	<i>POSITIVE BODY TRAITS</i>	7
	<i>STRENGTH</i>	30
PLANT	<i>COLLECTION OF PLANTS</i>	22
SPORT	<i>AGENT'S ACTION</i>	11

The prominence of sight and hearing in human perception is also at the root of the higher reliability that tends to be attributed to these modalities, as reflected in language. These observations have two consequences for synaesthesia. Firstly, it is more 'natural' for sight and hearing to be targets than sources. Sources, in the typical adjective-noun synaesthesia, have the function of qualifying and, often, evaluating targets, and it is therefore understandable that they have a preferential connection with the lower, subjective and evaluative, sensory modalities. Conversely, targets are more likely to be associated with the higher, objective, modalities. (88)

However, Werning *et al.* (2006) show that models posited in the literature are by no means universal and that they need to be constructed separately for each language. Likewise, Suárez-Toste (2013, 2017), in his studies on winespeak, notes that Ullmann's hierarchy of synesthetic transfer is undermined, see:

Synaesthetic metaphor is essential in the description and evaluation of wines and food. Too many parameters in sensory perception rely on otherwise inexpressible figures of speech. In that sense – at least in English, or most likely in most Western countries – the genre is heavily dependent on crossmodal mappings that do not necessarily comply with Ullman's hierarchy of sensory modalities or his Directionality principle. While many mappings follow an upwards direction, many important others do not, and even within those that do there are instantiations– even within deliberately popular contexts – that can only be categorized as statistically rare if not truly exceptional. (Suárez-Toste 2013: 189)

First of all, two different concepts have to be distinguished: the hierarchy of senses—human sensorium, as Ullmann (1957) named it—and source-to-target transfer in strong synesthetic metaphors (i.e., where both source and target are perceptual). The first idea is grounded in ancient Greek philosophy (Korsmeyer 1999). For example, Plato divided human senses into higher senses (vision and hearing) and lower, animal senses (taste and smell). Likewise, Aristotle considered sight to be the most important sense for humans, since it provides the greatest amount of information. According to later western philosophers, vision and hearing are higher senses because there can be a large distance between an object of perception and a human. In the case of taste, smell, or touch, the distance is small, or contact with the object of perception is direct. The difference in distance between the source of stimuli and organ of perception is interpreted by philosophers as a determinant of the moral, esthetic, and epistemic supremacy of sight and hearing over other senses.

The latter concept of the actual source-to-target transfer in synesthetic metaphors needs a corpus-based approach and does not necessarily comply with the philosophical hierarchy of senses. Strik Lievers (2015) suggests that a model of verbal synesthesia should be interpreted as a frequency-based hierarchy. Therefore, the frequencies of perceptual frames (as sources and as targets) in Synamet would be a base for a model of synesthesia in the corpus. In the next paragraphs of this section, I present the general model of synesthetic transfer in the Synamet corpus, and models of sub-corpora most abundant in synesthetic metaphor, i.e., BEER, MUSIC, PERFUME, and WINE.

The frequencies of perceptual frames as sources results in the following model of synesthetic transfer:

VISION → MULT. PERCEPTION → TOUCH → HEARING → TASTE → SMELL

The most frequent source is the **VISION** frame, while the predominant target is the **SMELL** frame. It must be emphasized that the **VISION** frame can be also a target frame (with **MULTIMODAL PERCEPTION** and **TOUCH** frames as sources), just like the **MULTIMODAL PERCEPTION** frame (with the **TOUCH** frame as a source), while the **TOUCH** frame as a target frame in synesthetic metaphors is rare and is not statistically significant—in this case, the transfer is unidirectional.

In the Synamet project, a special frame for borderline sensory perceptions (involving more than one sense and hence being hard to categorize) was separated: the **MULTIMODAL PERCEPTION** frame. This frame consists mainly of amalgams of visual and tactile perceptions, i.e., *SHAPE*, e.g., *angular*, *cylindrical*, *convex*, *concave*—Pisarkowa (1975) included those adjectives in the lexical field of touch—*SUBSTANCE*, e.g., *dense*, *thin*—also placed by Pisarkowa (1975) in the lexical field of touch. Nevertheless, Bronikowska (2006) notes that it is not necessary to come into direct, haptic contact with an object of perception to recognize the above features. Furthermore, the **MULTIMODAL PERCEPTION** frame contains the element *WEIGHT*, e.g., *lekki* ‘light’, *ciężki* ‘heavy’—these adjectives are considered to be elements of the lexical field of touch by Nagórko (1987). Therefore, the high frequency of the **MULTIMODAL PERCEPTION** frame as a source in synesthetic metaphors corroborates the predominance of sight and touch in our human sensorium.

The model of verbal synesthesia in Synamet differs from both Ullmann’s and Viberg’s propositions. Although the **VISION** frame is the most frequent source (see Viberg 1984), the **MULTIMODAL PERCEPTION** and **TOUCH** frames have close to the same frequency as the **VISION** frame as sources. Moreover, the **TOUCH** frame is rarely a target frame (unlike the **VISION** frame), which coincides with Ullmann’s model. The most significant difference is the ultimate target—in Ullmann’s hierarchy, it is sound, and in Viberg’s model, it is taste and smell. In the Synamet corpus, the **SMELL** frame is never a source frame (the raw frequencies are not statistically significant, see Tab. 8, otherwise than the **TASTE** frame, which is quite often used as a source to describe olfactory sensations, e.g., *słodka woń* ‘sweet scent’, *kwaśny zapach* ‘sour smell’, *gorzkawy aromat* ‘somewhat bitter aroma’, etc.; see Tab. 8). The **HEARING** frame in strong synesthetic metaphors serves as source and as a target comparably frequently; it is slightly more often a target, which is entirely inconsistent with Ullmann’s proposition of the verbal synesthesia hierarchy. Strik Lievers (2015) notes that Caballero and Suárez-Toste (2010), in their studies on wine discourse, observe that “sight is the sense most recurrently used to assess acidity” (1542). She admits that transfer in this direction (from sight to taste) is contrary to

Ullmann's model. Strik Lievers explains this incongruence by noting the necessity of expressing many subtle differences in taste in wine reviews. She also notes that studies on verbal synesthesia should use a general-language corpus rather than a specialized corpus (like wine discourse). The main problem is that Ullmann's corpus was not general-language because he analyzed poetry. Even if the corpus was general-language, Ullmann's hierarchy is still unsustainable for Polish. According to Judycka (1963), lexical items from the touch lexical fields are most often used in synesthetic metaphors and they collocate with words from all other perceptual fields, while lexemes in the olfactory lexical fields are metaphorical borrowings, from a diachronic perspective. In contrast, the literal senses of words referring to tactile experiences are stable and have not changed much over time (Ładziak 2015). For example, the adjective *gładki* 'smooth' is a descendent of Proto-Slavic **gladъkъ*, which meant 'having an even surface' (Boryś 2005). Likewise, Rogowska (2007) analyzes data from a Polish dictionary (Szymczak 1978–1981), excerpting perceptual lexemes used metaphorically for descriptions of other senses: the lexemes from the lexical field of touch were used in 120 synesthetic metaphors, lexical items from the visual lexical field were used in 40 synesthetic metaphors, as well as lexemes from the taste lexical field, lexical items from the auditory lexical field were used as sources in less than 20 synesthetic metaphors, and lexemes from the olfactory lexical field were never used as sources in synesthetic metaphors. Therefore, Ullmann's hierarchy is not compatible with Polish. The claim that it is universal for all languages cannot be sustained.

4.7.1.1 *Models of verbal synesthesia in sub-corpora of Synamet*

Models of verbal synesthesia vary as well in the main sub-corpora of Synamet²⁵ (i.e., the most productive in terms of synesthetic metaphors)—BEER, MUSIC, PERFUME, and WINE. The hierarchies of sources in MUs are as follows (see Tab. 44):

As can be seen in Tab. 44, all models of sub-corpora differ both from each other and from the average model of verbal synesthesia in Synamet. Although no pattern of sensory transfer occurs, there are mutual features in these hierarchies. The **VISION**, **MULTIMODAL PERCEPTION**, and **TOUCH** frames are the predominant sources (in the Synamet corpus, in the MUSIC, and the WINE

25 I restrict models of verbal synesthesia to four main sub-corpora, as the results of the standardized Pearson residuals for the rest of the categories are not statistically significant.

Tab. 44: Models of verbal synesthesia in Synamet and in the BEER, MUSIC, PERFUME, and WINE categories.

SYNAMET					
VISION →	MULTI.PERC. →	TOUCH →	HEARING →	TASTE →	SMELL
BEER					
HEARING →	MULTI.PERC. →	VISION →	TOUCH →	SMELL →	TASTE
MUSIC					
VISION →	MULT.PERC. →	TOUCH →	TASTE →	SMELL →	HEARING
PERFUME					
HEARING →	VISION →	TOUCH →	TASTE →	MULT.PERC. →	SMELL
WINE					
VISON →	MULT.PERC →	TOUCH →	HEARING →	SMELL →	TASTE

sub-corpora, the **VISION** frame is the ultimate source) and the **SMELL** and **TASTE** frames are the main targets. The **HEARING** frame exhibits the biggest desertification: in the **MUSIC** sub-corpus, it is the ultimate source (for natural reasons), though in the **BEER** and **PERFUME** sub-corpora, the **HEARING** frame is the ultimate source (contrary to Ullmann's model).

Nevertheless, the dissimilarity between the models of verbal synesthesia is striking. It may result from any of the following reasons:

1. **Language**—although Ullmann's model was supported by studies on English, Hebrew (Shen and Cohen 1998), Italian (Strik Lievers 2015), Japanese (Williams 1976), Chinese (Duang and Gao 2014), it is not supported by the analysis of Polish (Judycka 1963; Rogowska 2007).
2. **Lexeme class**—it is quite possible that the outcome of analysis differs because scholars restrict their analysis to one part of speech. Ullmann's hierarchy (1957) is inconsistent with Viberg's hierarchy (1984); however, Ullmann analyzes adjectives, while Viberg concentrates on verbs. Strik Lievers (2015) notes that the sensory lexical fields have different distributions of parts of speech; for example, the auditory lexical field is rich in nouns and the tactile lexical field is rich in adjectives.
3. **Type of corpus**—Strik Lievers (2015) rightly emphasizes that analyses of different corpora (general versus specialist) can result in different outcomes. Synamet is a specialized corpus since it contains texts excerpted from thematic blogs. The analysis of sensory transfer in the sub-corpora of Synamet supports that hypothesis—the topics (wine, beer, perfume, or music reviews)

have a significant impact on the model of verbal synesthesia. At the same time, the analysis challenges the claim that the model of sensory transfer from lower to higher modalities is universal.

4.7.2 Embodiment in synesthetic metaphors

Similar patterns in the sensory transfer analyzed in the previous section can be explained by the notion of *embodiment*, which is one of the basic hypotheses of cognitive linguistics. From the perspective of embodiment, the human conceptual system is developed in constant interaction between the body and the environment (e.g., Gibbs 2003, 2005; Górska 2014; Lakoff and Johnson 2008 [1980], 1999; Lakoff 2011 [1987], 1993, 2012; Müller 2017). Gibbs (2003) summarizes the embodiment premise as follows:

People's subjective, felt experiences of their bodies in action provides part of the fundamental grounding for language and thought. Cognition is what occurs when the body engages the physical, cultural world and must be studied in terms of the dynamical interactions between people and the environment. Human language and thought emerge from recurring patterns of embodied activity that constrain ongoing intelligent behavior. We must not assume cognition to be purely internal, symbolic, computational, and disembodied, but seek out the gross and detailed ways that language and thought are inextricably shaped by embodied action. (2)

Adopting the main premise of embodiment results in considering conceptual metaphors to be experience-based. Lakoff (2012) summarizes this concept as follows:

Overall, conceptual metaphors structure a huge amount of our mental lives. They are embodied in two ways: via embodied cognitive primitives that structure the frames in frame-to-frame mappings and via the hundreds of primary metaphors that ground human metaphor systems and more complex metaphors in embodied experience. Via the embodiment of cognitive primitives and primary metaphors abstract (that is, non-physical) concepts become embodied. The embodied frames may characterize abstract ideas, and the embodied metaphors usually do. (778)

Although Ronga (2016) states that “this theoretical framework accords a major role to synaesthesias, which highlight the close connection between language and perception” (48), only weak synesthetic metaphors with a perceptual source support the hypothesis of embodiment (cf. Lakoff 2012). Nonetheless, the Synamet corpus also contains strong synesthetic metaphors in which both sources and targets are perceptual, and weak synesthetic metaphors with non-perceptual sources. The latter dispute the embodiment idea. Lakoff and Johnson (1999) write that:

[H]uman beings find phenomena they can see, hear, feel, taste and/or smell easier to understand and categorize than phenomena they cannot. It is perceptibility that makes the former phenomena concrete, and the lack of it that makes the latter abstract. (249)

If so, how can it be that people need metaphors where one perceptual experience is understood in terms of another perceptual experience? Does it mean that strong synesthetic metaphors also undermine the idea of embodiment? Not necessarily. The source-to-target sensory transfer in strong synesthetic metaphors seems to be partly grounded in a human physical experience. The traditionally distinguished senses are a product of ancient Greek philosophy (Winter 2019). Aristotle wrote that there are five senses: sight, hearing, touch, taste, and smell. This categorization does not entirely correspond to actual biological perception. O'Callaghan (2017) writes that “perceiving does not just involve visual, auditory, tactual, olfactory, and gustatory systems working in parallel and in isolation. It involves extensive cooperation and coordination among the senses” (156). There is some evidence for sensory correspondences (Winter 2016b: 133; for an overview of research on synesthetic tendencies in c, see Marks 1996), e.g., vision/touch, vision/hearing, and taste/smell integrations. Marks (1996: 42–43) distinguishes between two types of synesthesia: *strong* and *weak*.²⁶ The latter is described by Marks as synesthetic tendencies and can be observed in the vast majority of people. For example, non-synesthetes tend to describe soprano voice as brighter and sharper than alto. Some linguistic evidence, gathered during the analysis of synesthetic metaphors in the Synamet corpus, seems to reflect this multimodality of human perception.

One perceptual modality interconnection is the integration of sight and touch, i.e., the perception of tactile orientation can be influenced by visual information (Walsh 2000). Both senses have to interact, e.g., when one is reaching for an object or determining the shape of an object via touch (for a more detailed overview of the studies on touch and vision integration from the neurological perspective, see Winter 2016b: 130–131). The analysis of synesthetic metaphors in Synamet proves that the **VISION**, **TOUCH**, and **MULTIMODAL PERCEPTION** (in which the elements *SHAPE* and *CONSISTENCY* integrate visual and tactile perception) frames are the predominant sources in MUs. In some metaphors, where the **VISION** frame is the target and the **TOUCH** frame

26 The terms used by Marks (1996) of *strong* and *weak synesthesia* are not equivalent to the terms *strong* and *weak synesthetic metaphors* used in this monograph, following definition by Werning *et al.* (2006). See the *Theories of verbal synesthesia* chapter.

is the source, most often the *COLOR* element of the **VISION** frame is described by lexical items evoking the *TEMPERATURE* element of the **TOUCH** frame. Transfer in the opposite direction is rare and statistically not significant. These results support the hypothesis by Szwedek (2000, 2011, 2012, 2014, 2017) that touch is more fundamental than vision because it enables us to physically identify objects. Szwedek (2011) concludes:

Touch is a unique sense in that it is the only whole-body sense, it is the only physical contact sense, and in that the touching-organs — hands and mouth — have the biggest neuronal representation in the brain (compare sensory and motor homunculus models). However, more importantly, it is the most fundamental and primeval of all senses because it develops as early as the eighth week of pregnancy and thus simultaneously with the formation of the neural system (also in the eighth week). Hence, the sense of touch is programmed earliest and at the deepest level of the neural system. In later life we are totally unaware of the primordially of this sense. (358–359)

Another dominant pattern of multi-sensory integration is the strong correlation between auditory and visual experiences (Marks 1982a, b; Winter 2016b). In Synamet, MUs with the **HEARING** frame as target and the **VISION** frame as source are frequent (see Tab. 10). The most typical pairing of FEs are *BACKGROUND* (**VISION** frame) → *INSTRUMENT* (**HEARING** frame); *SIZE* (**VISION** frame) → *SOUND* (**HEARING** frame); *COLOR* (**VISION** frame) → *TYPE OF SOUND* (**HEARING** frame). Marks and Mulvenna (2013: 23), summarizing the research on sound and vision interaction, note that these auditory-visual correspondences can be traced back to early childhood, even early infancy. Subjects tend to connect auditory pitch and visual lightness. This pattern is not culture-dependent since it is also observed in people from non-Western cultures, i.e., the Himba people.

Gustatory and olfactory perception integration is yet another frequent pattern in the Synamet corpus. In synesthetic metaphors, the most frequent pairs of **TASTE** and **SMELL** frames elements are *DESIRABLE STATE*²⁷ (**TASTE** frame) → *SMELL SENSATION* (**SMELL** frame); *TASTE SENSATION* (**TASTE** frame) → *SMELL SENSATION* (**SMELL** frame); *TYPE OF TASTE* (**TASTE** frame) → *SMELL SENSATION*²⁸ (**SMELL** frame). According to Winter (2016b: 131–132), this correlation has physical grounds. He summarizes the results of several studies on the relationship between gustatory and olfactory perceptions—for example, eating necessarily involves smell, taste and smell are integrated in

²⁷ For example, *świeży zapach* ‘fresh smell’.

²⁸ For example, *śłodki aromat* ‘sweet aroma’.

brain networks, and taste and smell share involvement in emotional processes (therefore words from the taste and smell lexical fields are, according to Winter (2016a), emotionally loaded). Such multimodal perception brings about such strong neurological connections between those two senses that, according to Stevenson (2009), it may “result in blurred perceptual boundaries between a taste and a smell. This then makes it hard to judge one component independently of the other” (106). Ramachandran and Hubbart (2003) also note that “the brain pathways for smell and taste are closely intermingled and project to the same parts of the frontal cortex” (52).

Instead, the **TASTE** frame is quite often a target in MUs where the source is the **TOUCH** frame. The most typical pairs of **TASTE** and **TOUCH** FEs are *TEXTURE (TOUCH frame) → OBJECT OF PERCEPTION (TASTE frame)*; *susceptibility to destruction (TOUCH frame) → OBJECT OF PERCEPTION (TASTE frame)*; *TEXTURE (TOUCH frame) → TASTE COMPONENT (TASTE frame)*; and *TEXTURE (TOUCH frame) → TASTE SENSATION (TASTE frame)*. This linguistic evidence reflects the biological characteristics of gustatory perception. Flavor is a mixture of several sensations: not only taste, but also the temperature, texture, and smell of food (see Skolik 2011; Smith 2015). Smith (2015) notes that “touch gives us information about the texture of food—whether something is creamy, oily, chewy, sticky, or crunchy” (3). The strong integration of tactile and gustatory perceptions is evident, especially in the WINE sub-corpus (Zawisławska and Falkowska 2017). The importance of tactile perception in wine tasting is emphasized by Suárez-Toste (2013):

It seems useful come to this point to remark that taste is an extremely poor and limited sense even at wine appreciation. Once in the mouth wine transmits different impressions: the most immediate of these is temperature, of course, but more importantly we perceive a series of other tactile impressions that include volume, weight, mouthfeel, and length. [...] We should further consider that – other than the classic sweet, salt, bitter, sour, and perhaps the trendy umami – most of the impressions we popularly associate with substances and describe as flavors are simply aromas that the open passage between mouth and nose leads us to confuse, and so we find a real problem because taste assumes – metonymically, via the mouth as dedicated sense organ – sensory impressions which belong to smell, taste, and touch. It comes as no surprise, then, that the term mouthfeel has become generalized in wine language to refer to several tactile impressions. (173)

In Synamet, the highest frequency pairs of frames involve **HEARING** (source) and **SMELL** (target). The most typical pairs of the **HEARING** and **SMELL** FEs are *COMPOSITION (HEARING frame) → COMPLEX SMELL SENSATION (SMELL frame)*; *GROUP OF SOUNDS (HEARING frame) → COMPLEX*

SMELL SENSATION (**SMELL** frame); *COMPONENT* (**HEARING** frame) → *SMELL SENSATION* (**SMELL** frame); and *LOUDNESS* (**HEARING** frame) → *SMELL SENSATION* (**SMELL** frame). Although in general Polish these correlations are quite rare (Judycka 1963), there is evidence (Crisinel and Spence 2010, 2011) that smell and sound are integrated in human perception:

Our results confirm the existence of consistent crossmodal associations between odors and pitch. Moreover, they also demonstrate that some odors are preferentially matched to a specific type of musical instrument. The use of the term ‘note’ to describe components of a perfume might thus be more than merely a metaphor. Fruit odors seem to be consistently associated with highpitched notes. This result accords well with previous results demonstrating that sour and sweet tastes, two qualities present in fruits, are associated with high pitch (Crisinel and Spence 2010).

Another argument for embodiment, even in weak synesthetic metaphors, with the non-perceptual source domain, is a predominance of personification and reification. Dancyngier and Sweetser (2014: 62) note that ontological metaphors, in which an abstract entity is personified or reified (objectified), portray targets as more concrete entities. Scholars from the Moscow and Lublin ethnolinguistic schools emphasize anthropocentrism as a key factor in culture and language (see, for example, Bartmiński, Niebrzegowska-Bartmińska, and Nycz 2004; Bartmiński and Pajdzińska 2008; Tolstaja 2017; Toporov 2015). According to Tolstaja (2017), anthropocentrism is reflected in language in two ways—humans can be either objects of interpretation by means of cultural codes or subjects who explore the world by relating everything to their own, subjective perspectives. Therefore, “humanizing” other living beings, objects, and phenomena is for us a natural way of categorizing and interpreting the world. In the Synamet corpus, personification outweighs other types of metaphors. In particular, the **SMELL** and **TASTE** frames are often described by means of human body parts, body features, sex, movement, character, or personality. The **OBJECT** frame is the second-largest source in MUs in the Synamet corpus. Szwedek (2011) writes that “domain of physical objects is primeval and fundamental not only in the conceptualization and verbalization of metaphysical phenomena but also in the phylogenetic development of metaphorization” (342).

Strong synesthetic metaphors can be also explained by a different degree of subjectivity in perceptual experience. Grady (1997) and Tyler and Evans (2001) posit that the basic function of metaphor is to translate highly subjective sensations into language that can be understood by other people. They distinguish between two types of concepts: *image concepts* and *response concepts*. Image concepts are sensorimotor and represent external experiences, which are

relatively objective, while response concepts are internal states that arise as a reaction to some kind of stimulus (e.g., love). Basically, all sensory experiences are supposed to be image concepts, which contradicts the existence of strong synesthetic metaphors (in which both source and target are physically-based concepts). However, our sensory perceptions differ with respect to the level of subjectivity. Sight is the most important sense for humans (Młodkowski 1998: 61; Paradis and Hommerberg 2016: 184) since it provides about 87 % information about the world, while auditory perception provides 7 %, olfactory perception 3.5 %, tactile perception 1.5 %, and gustatory perception a little over 1 %. That fact is reflected in the synesthetic metaphors by the predominance of the **VISION** frame as a source. Visual perception is also quite objective—an object of perception can be observed intersubjectively. On the other hand, olfactory perception seems to be much more subjective and harder to express (Cain 2012)—this hypothesis supports the fact that the **SMELL** frame is the ultimate target in synesthetic metaphors in Synamet. As Badyda (2013: 78) rightly points out, smell is mostly depicted in figurative language because of its dynamic and variable nature. Olfactory perception is limited by human physiology, as olfactory organs have the ability to adapt to a smell and, as a result, not perceive it anymore. Another problem is that the intensity of a smell can change over time—Badyda emphasizes the fact that sometimes we can be confronted with an intense aroma, while in other cases, the presence of a smell is background to more distinct sensations. Likewise, emotional and subjective factors in odor description are emphasized by various researchers (Chastrette 2002; Classen, Howes and Synnot 2002; Köster 2002). Velasco-Sacristán and Fuertes-Olivera (2006) believe that “odors, unlike words or pictures, do not lend themselves to a clear-cut conceptual analysis”, which is seen as a “cognitive drawback” (1224), hindering the verbalization of olfactory experience. According to Hudson and Distel (2002), “odors are the subjective products—constructs” (408). Paradis and Hommerberg (2016) note that smell and taste “are associated with much more subjectivity than vision. Smell is known to appeal to emotions, but to simultaneously be an elusive phenomenon from a cognitive point of view” (184). Therefore, visual sensations can be regarded as image concepts, while olfactory and gustatory sensations are response concepts.

It is unarguable that some source-to-target transfers in synesthetic metaphors are embodied and motivated by our biology. The neurological basis motivating transfer in sensory vocabulary is so strong and evident that Winter (2019: 105) argues that such transfers should not be even considered synesthetic metaphors. He hypothesizes that sensory adjectives have highly multisensory or supramodal

meanings and that there are no mappings between sources and targets—e.g., the adjective *sweet* describes both gustatory and olfactory sensations.

Nevertheless, embodiment does not explain all sensory transfers in strong synesthetic metaphors or all mappings in weak synesthetic metaphors. Therefore, yet another conceptual factor has to be considered—the internal logic of metaphorical mapping between analogical FEs. This problem is addressed in the next section.

4.7.3 Frame structure in synesthetic metaphors

Lakoff (2012) posits that mappings in metaphors are between corresponding roles of source-and-target frames:

Conceptual metaphors are frame-to-frame mappings, with the roles of the source frame mapping to corresponding roles of the target frame. In conceptual metaphors, source and target frame mappings are not necessarily one to one. In some cases not all roles or role fillers are mapped, and in others metaphorical roles are added to the target domain. (776)

Sullivan (2006, 2013, 2018) believes that FEs, relations, and inferences are preserved in metaphoric mappings. Therefore, frames are subject to the Invariance Principle (Lakoff, 1993). Sullivan (2013) notes that “Metaphorical mappings preserve the cognitive topology (that is, the image schema structure) of the source domain, in a way consistent with the inherent structure of the target domain” (37). Petersen *et al.* (2008: 17), during their analysis of adjective-noun synesthetic metaphors using frames, discover that frames having inappropriate values for certain adequate attributes can be comprehended, unlike frames with inadequate attributes. For example, the phrase *quiet smell* is accessible since the frame of olfactory perception contains the element *INTENSITY*, and the adjective *quiet* in the primary frame of audible perception refers to the intensity of a sound. According to these assumptions, transfer in synesthetic metaphors in Synamet can be explained by the analogical structure of source and target frames. Indeed, there is some evidence that such internal logic underlies the mappings in the analyzed MUs.

In the *PERFUME* category, the most frequent source-to-target mapping in synesthetic metaphors is between the **HEARING** frame (the source) and the **SMELL** frame (the target). Judycka (1963) noted that transfer from auditory perception to olfactory perception is rare in general Polish, but in the specialist perfumery discourse, it is the main conceptualization. There is some evidence that people tend to associate sound and smell (Crisinel and Spence 2010), yet the correspondences between auditory and olfactory perceptions in the Synamet

Tab. 45: Analogical elements in the HEARING and SMELL frames.

ELEMENTS	HEARING frame	SMELL frame	Lexicalized borrowed terms
AGENT (the creator)	kompozytor 'composer'	perfumiarz 'perfumer'	—
COMPONENTS	nuta 'note'	olejek zapachowy 'essential oil'	<i>nuta</i> 'note'
COMBINATION OF ELEMENTS	akord 'chord'	mieszanka olejków o różnej intensywności 'blend of oils characterized by different intensity'	<i>akord</i> 'chord'
RESULT	muzyka, kompozycja 'music, composition'	mikstura olejków i rozpuszczalnika (perfumy) 'mixture of essential oils and solvent'	<i>kompozycja</i> 'composition'

corpus are by far more specified, complex, and elaborated. The lexicalized term *nuta zapachowa* 'note' refers to an aromatic substance with a specific intensity, which is released in the air at a certain time.²⁹ This basic concept in the perfumery discourse gives rise to a chain of associated synesthetic metaphorical terms where the act of perfume creation is compared to the act of creating music (see Tab. 45).

A fragment of a perfume review (15) presents in the most developed way a systematic transfer from the **HEARING** frame to the **SMELL** frame:

- (15) *Annunziata – Isos*³⁰ to kompozycja, której przepięknie zestrojona aranżacja sprawiła iż wyobraziłem sobie, że tak oto mógłby pachnieć Loewe 7³¹ w wersji stereofonicznej... jeden kanał odtwarza partię goździka, zaś drugi uzupełnia brzmienie akordu o równie ujmujące płasanie przypominającej kadzidło – mirry... zaś za tło odpowiada stonowana sekcja rytmiczna, osnuta na ciepłym akordzie drzewnym i cichutkim duecie vetivery z miętą... Ta piękna, chwilami wręcz sielankowa i niesamowicie wyrafinowana melodia, sączy się niepiesznie z

29 <http://www.perfumy.edu.pl/encyklopedia/nuty-zapachowe.html>.

30 The *Annunziata Isos* perfume for men and women by Farmacia SS.

31 The *Loewe 7* cologne by Loewe.

membrany mojej skóry [...]. Zapach jest dość cichy jak na drzewnego kadzidlaka [...] – przez co wymaga pewnego skupienia, podczas delektowania się jego kameralnym brzmieniem...

(<https://perfumomania.wordpress.com/2013/01/23/farmacia-ss-annunziata-isos-czyli-jak-moglyby-pachniec-loewe-7-w-wersji-stereo/>)
 ‘Annunziata-Isos is a composition whose beautifully tuned arrangement made me imagine that Loewe 7 could smell like this in a stereo version... One channel plays a part of a clove and the second one completes a sound of a chord with just as charming dancing of myrrh, which resembles incense ... while a background is a toned rhythm section, based on a warm, wooden chord and a quiet duet of vetiver and mint... This beautiful and at times even bucolic and fantastically sophisticated melody pours deliberately from a membrane of my skin [...]. The aroma is rather quiet for a wooden incense perfume [...]—because of which, it needs some focus while delighting in its low-key sound...’

The similarities in frame structure is the base for mappings between the **COOKING** source frame and such targets as perfume (**SMELL** frame) or music (**HEARING** frame), e.g., (16):

- (16) Prawdziwą ozdobą i gwoździem kompozycji jest pięknie ujęta nuta rabarbaru... soczystego, świeżo zerwanego i ani trochę mdłego... Ów rabarbar skropiono obficie sokiem cytrynowym, doprawiono odrobiną kolendry oraz dosłodżono lawendą i słodziutkim sokiem z granatów...
 (<https://perfumomania.wordpress.com/2011/08/22/puma-free-flowing-man-czyli-cytrusowy-rabarbar/>)
 ‘The true decoration and headliner of the composition is a note of rhubarb, beautifully captivated, which is juicy, freshly picked, and not at all bland... The rhubarb is drizzled with lemon juice, flavored with a pinch of coriander, and sweetened with lavender and very sweet pomegranate juice.’

The common elements in frame structure are *COMPONENT* (ingredients in a recipe → essential oils in perfume; parties of instruments and vocals in music), *AGENT* (cook → perfumer; composer), *ACTION* (mixing ingredients → mixing essential oils; arranging instruments), and *RESULT* (a dish → a perfume; a piece of music).

There are mappings in synesthetic metaphors that are unquestionably grounded in the analogical structure of source and target frames. Nevertheless, some mappings in strong and weak synesthetic metaphors in the Synamet corpus still remain unexplained. In the *Metaphors in Synamet* chapter, I argue that quite a lot of synesthetic metaphors are based not on physical experience or analogy in the frame structure, but are instead triggered by different factors—other metaphorical terms, the names of review subjects, and cultural influences.

5 Activators in Synamet

This chapter is divided into three parts. The first part deals with the basic statistics of activators (i.e., LUs that evoke frames in MUs). I present the frequency of parts of speech (adjectives, adverbs, nouns, and verbs) in the entire corpus. Afterwards, I analyze the vocabulary that evokes the main perceptual frames and test the correlations between frames as sources or targets and the number of parts of speech that activate those frames. Then, I examine the LUs that most frequently evoke each perceptual and non-perceptual frame. In the second part of this chapter, I try to verify the hypothesis that different parts of speech can evoke sources or targets in metaphors (Cameron 2003; Deignan 2005; Pragglejaz Group 2007; Steen *et al.* 2010; Sullivan 2018). The third and the last part deals with a semantic factor in creation of verbal metaphors—a factor that is easily omitted when a linguistic form of metaphor is reduced to the conceptual dual schema *X is Y*.

5.1 Statistics of activators in Synamet

The frames in the Synamet corpus are evoked by 15,855 word forms, which represent 3,974 LUs in total. A total of 9,126 word forms (1,925 lexemes) activate perceptual frames and 6,729 word forms (2,049 lexemes) activate non-perceptual frames. There is more diversity of lexemes in those activating non-perceptual frames than those activating perceptual frames, and the difference is statistically significant. The chi-squared test results are $\chi^2 = 106.74$, $df = 1$, $p\text{-value} < 0.0001$, Cramer's $V = 0.073$. Fig. 22 presents Pearson residuals and Tab. 46 presents the standardized residuals.

The most frequent parts of speech are nouns (1,952 lexemes), followed by adjectives (1,222 lexemes); verbs are scarcer (644 lexemes) and adverbs are the rarest (154 lexemes) (see Fig. 23).

One of the main reasons that the FrameNet ontology was not sufficient for the purposes of the Synamet project was the prevalence of verbs in FrameNet. The differences between Synamet and FrameNet are sizable and statistically significant (Pearson chi-squared test results: $\chi^2 = 758.1$, $df = 2$, $p\text{-value} < 0.0001$, Cramer's $V = 0.211$). Tab. 47 shows the differences between Synamet and FrameNet in terms of the standardized Pearson residuals. All differences are statistically significant. FrameNet has many fewer adjectives and nouns. In contrast, Synamet exhibits a much smaller set of verbs.

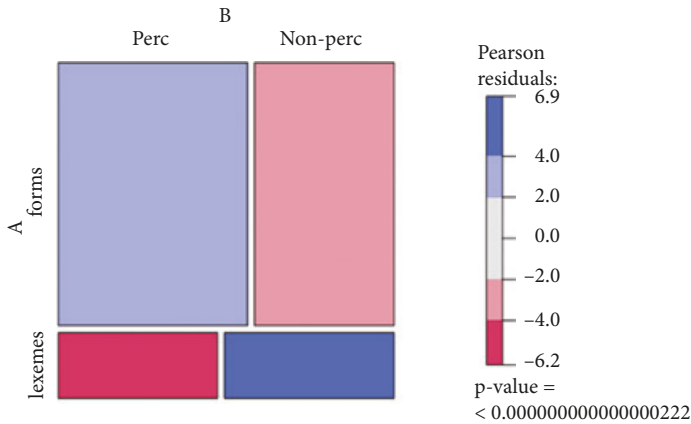


Fig. 22: Pearson residuals of word forms and lexemes evoking perceptual and non-perceptual frames.

Tab. 46: Standardized Pearson residuals of word forms and lexemes evoking perceptual and non-perceptual frames.

	Perceptual frames	Non-perceptual frames
word forms	10.349	-10.349
lexemes	-10.349	10.349

Perceptual and non-perceptual frames in Synamet differ quite noticeably with regards to being evoked by nouns or verbs. The chi-squared test results are $\chi^2 = 95.562$, $df = 3$, $p\text{-value} < 0.0001$, Cramer’s $V = 0.187$. Non-perceptual frames are evoked more often by verbs, while perceptual frames are evoked more often by nouns (see Tab. 48).

5.1.1 Frequency of lexemes evoking perceptual frames

The set of lexemes is different for each perceptual frame. The **SMELL** frame is associated with the densest resource of lexical items (458 lexemes). The **HEARING** frame is associated with next most dense resource of lexical items (426 lexemes). The **VISION** and **TASTE** frames have fewer evoking lexemes (387 and 330 lexemes, respectively). The **TOUCH** (180 lexemes) and **MULTIMODAL PERCEPTION** (142 lexemes) frames have the smallest set of evoking lexemes (see Fig. 24).

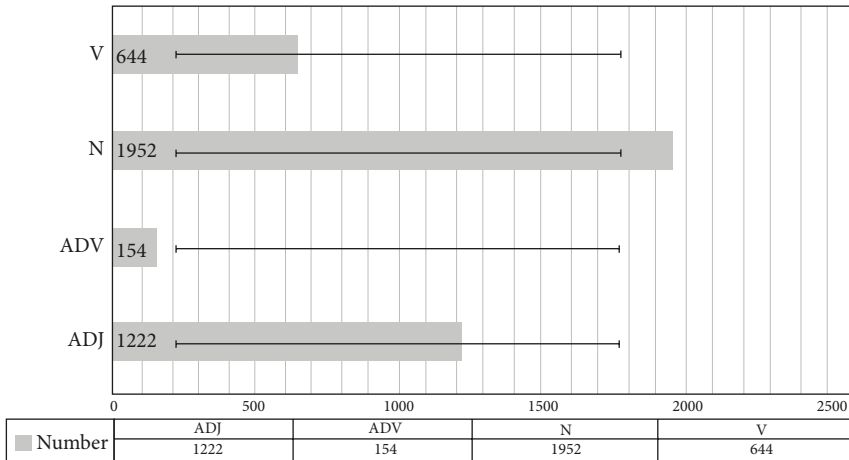


Fig. 23: Frequency of parts of speech in Synamet.

Tab. 47: Standardized Pearson residuals of the frequency of parts of speech in Synamet and FrameNet.

	FrameNet	Synamet
ADJ	-18.318	18.318
N	-9.717	9.717
V	25.947	-25.947

Tab. 48: Standardized Pearson residuals of the frequency of parts of speech evoking perceptual and non-perceptual frames in Synamet.

	ADJ	ADV	N	V
perceptual frames	1.058	2.210	5.205	-9.543
non-perceptual frames	-1.058	-2.210	-5.205	9.543

Likewise, perceptual frames differ with respect to parts of speech. Most of the differences are statistically significant. Fig. 25 shows the raw frequencies of parts of speech for each frame and Tab. 49 presents the standardized Pearson residuals (chi-squared test results: $\chi^2 = 397.94$, $df = 15$, $p\text{-value} < 0.0001$, Cramer's $V = 0.263$).

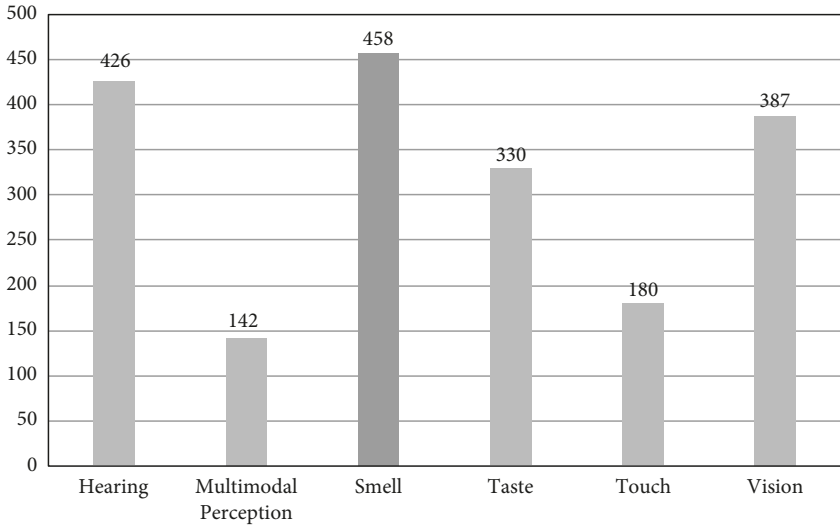


Fig. 24: Lexical items evoking perceptual frames in Synamet.

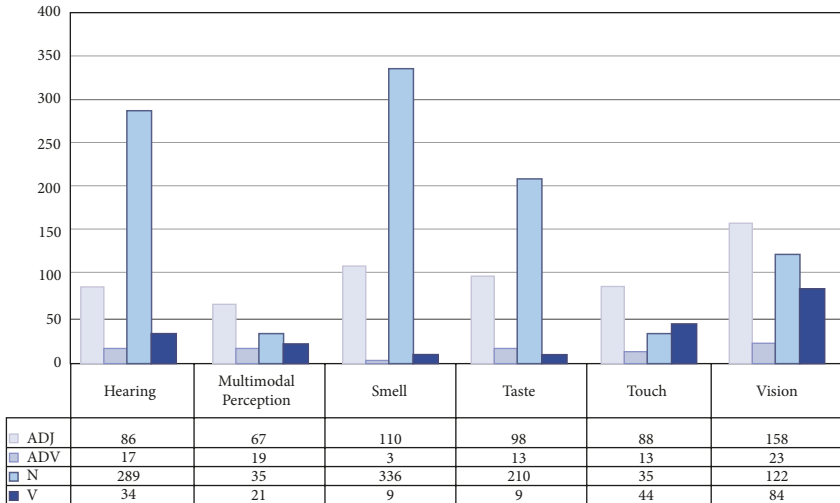


Fig. 25: The raw frequencies of parts of speech for the individual perceptual frames in Synamet.

Tab. 49: The standardized Pearson residuals of frequencies of parts of speech evoking perceptual frames in Synamet.

	HEARING	MULTIMODAL PERCEPTION	SMELL	TASTE	TOUCH	VISION
ADJ	-5.726	4.160	-3.981	-0.802	5.252	4.386
ADV	-0.655	5.216	-4.600	-0.608	1.784	1.439
N	6.7688	-7.138	9.808	4.093	-9.594	-9.655
V	-1.889	1.755	-6.802	-5.039	6.444	8.096

The **SMELL**, **HEARING**, and **TASTE** frames are most often evoked by nouns. The **TOUCH**, **VISION**, and **MULTIMODAL PERCEPTION** frames are characterized by a high frequency of adjectives. The **VISION** and **TOUCH** frames are most often evoked by verbs. The **MULTIMODAL PERCEPTION** frame exhibits a high frequency of adverbs.

The correlation between the number of lexemes, parts of speech, and sources or targets was tested by the Pearson correlation coefficient (r) and the Kendall rank correlation coefficient (τ) (R Core Team 2012). There is no statistically significant correlation between the total number of lexemes and the likelihood of being a source frame, but there is a significant positive strong correlation between the number of lexemes and the prevalence of being a target frame: Pearson $r = 0.713$, $t = 2.035$, $df = 4$, p -value = 0.055; Kendall's $\tau = 0.733$, $T = 13$, p -value = 0.027.

There is no correlation between the number of adjectives and the prevalence of being a source or target frame. In contrast, test results show a positive correlation between the number of adverbs and the prevalence of being a source frame, and a negative correlation between the number of adverbs and the prevalence of being a target frame:

1. ADV and source frame: Pearson $r = 0.933$, $t = 5.194$, $df = 4$, p -value = 0.003; Kendall's $\tau = 0.828$, $z = 2.295$, p -value = 0.010;
2. ADV and target frame: Pearson $r = -0.840$, $t = -3.108$, $df = 4$, p -value = 0.0179; Kendall's $\tau = -0.552$, $z = -1.530$, p -value = 0.062.

The test results reveal a significant positive correlation between the number of nouns and the prevalence of being a target frame (Pearson $r = 0.890$, $t = 3.923$, $df = 4$, p -value = 0.008; $z = 2.295$, Kendall's $\tau = 0.828$, p -value = 0.010). In contrast, there is no statistically significant correlation between the number of nouns and the prevalence of being a source frame.

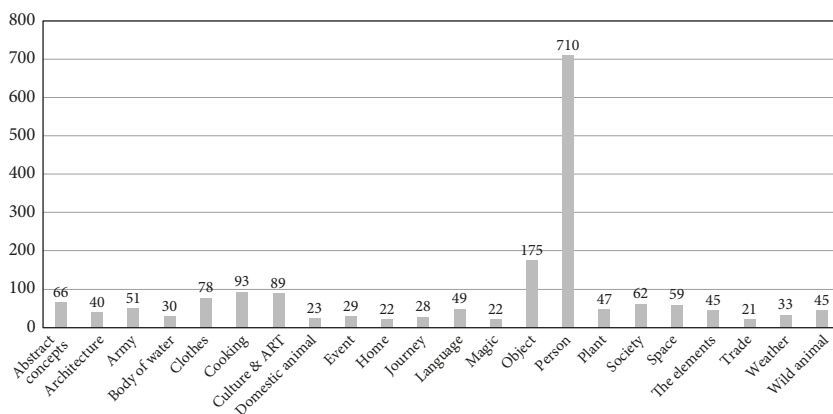


Fig. 26: The non-perceptual frames with the biggest sets of lexemes.

There is a statistically significant positive correlation between the number of verbs and the prevalence of being a source frame (Pearson $r = 0.798$, $t = 2.655$, $df = 4$, $p\text{-value} = 0.028$, Kendall's $\tau = 0.690$, $z = 1.912$, $p\text{-value} = 0.027$), while there is no correlation between the number of verbs and the prevalence of being a target frame.

5.1.2 Frequency of lexemes evoking non-perceptual frames

The biggest set of lexical items evokes the **PERSON** frame, with 710 lexemes. The next frame, the **OBJECT** frame, exhibits much fewer evoking lexemes, with 175 lexical items. Fig. 26 presents the non-perceptual frames evoked most frequently by lexemes (more than 20 times).

5.1.3 Frequency of lexical items evoking perceptual and non-perceptual frames

The most frequent lexical items (the first 20 lexemes in the frequency list) in perceptual and non-perceptual frames were compared with the National Corpus of Polish (NKJP) (Przepiórkowski *et al.* 2012) in an attempt to determine the importance of lexemes in the Synamet corpus. The lexemes in NKJP were retrieved with the PELCRA search engine (Pęzik 2012). Tables (50–56) below give the following information about a lexical unit: part of speech (PS), raw frequencies of a lexical item in Synamet (f_{SM}) and NKJP (f_{NKJP}), normalized

Tab. 50: Keywords that most frequently evoke the HEARING frame.

LEXEME	PS	<i>f</i> SM	<i>nf</i> SM	<i>f</i> NKJP	<i>nf</i> NKJP	p-value	LL	Log Ratio
<i>nuta</i> 'note'	N	482	356.588	2,609	0.108	p < 0.0001	+ 6757.32	11.68
<i>kompozycja</i> 'composition'	N	177	130.946	4,082	0.169	p < 0.0001	+ 1991.97	9.59
<i>akord</i> 'chord'	N	107	79.159	806	0.033	p < 0.0001	+ 1434.41	11.20
<i>riff</i> 'riff'	N	65	48.087	173	0.007	p < 0.0001	+ 993.02	12.70
<i>brzmienie</i> 'tone'	N	93	68.802	9,421	0.392	p < 0.0001	+ 775.25	7.45
<i>wokal</i> 'vocal'	N	55	40.689	446	0.018	p < 0.0001	+ 729.69	11.10
<i>dźwięk</i> 'sound'	N	83	61.404	11,838	0.492	p < 0.0001	+ 635.71	6.96
<i>muzyka</i> 'music'	N	80	59.184	37,890	1.577	p < 0.0001	+ 424.08	5.23
<i>muzyczny</i> 'musical'	ADJ	62	45.868	18,246	0.759	p < 0.0001	+ 386.34	5.92
<i>gitara</i> 'guitar'	N	35	25.893	3,914	0.162	p < 0.0001	+ 284.91	7.31
<i>gitarowy</i> 'guitar'	ADJ	23	17.015	586	0.024	p < 0.0001	+ 254.36	9.45
<i>melodia</i> 'melody'	N	30	22.194	3,376	0.140	p < 0.0001	+ 243.84	7.30
<i>głos</i> 'voice'	N	72	53.266	111,328	4.634	p < 0.0001	+ 220.09	3.52
<i>bas</i> 'bass'	N	20	14.796	1,598	0.066	p < 0.0001	+ 176.11	7.80
<i>rock</i> 'rock'	N	21	15.535	4,107	0.170	p < 0.0001	+ 147.75	6.51
<i>rockowy</i> 'rock'	ADJ	16	11.836	2,930	0.121	p < 0.0001	+ 114.65	6.60
<i>gama</i> 'gamut'	N	14	10.357	2,108	0.087	p < 0.0001	+ 105.73	6.88
<i>ton</i> 'pitch'	N	23	17.015	19,143	0.796	p < 0.0001	+ 96.94	4.42
<i>brzmień</i> 'to sound'	V	19	14.056	26,388	1.098	p < 0.0001	+ 61.82	3.68
<i>piosenka</i> 'song'	N	15	11.097	16,132	0.671	p < 0.0001	+ 55.95	4.05

frequencies in Synamet (*nf* SM) and NKJP (*nf* NKJP), p-value, log-likelihood ratio³² (LL) (Rayson and Garside 2000), and log ratio³³ (Hardie 2014). I assume the critical cutoff point for the statistical significance is at p-value < 0.01.

32 The higher the log-likelihood value, the more significant is the difference between two frequency scores:

- 95th percentile; 5 % level; p < 0.05; critical value = 3.84
- 99th percentile; 1 % level; p < 0.01; critical value = 6.63
- 99.9th percentile; 0.1 % level; p < 0.001; critical value = 10.83
- 99.99th percentile; 0.01 % level; p < 0.0001; critical value = 15.13
(<http://ucrel.lancs.ac.uk/llwizard.html>).

33 The log ratio is a statistic for keywords, collocations, and lock words. The log ratio statistic is an "effect-size" statistic, not a significance statistic: it represents how big the difference between two corpora is for a particular keyword.

Tab. 51: Keywords that most frequently evoke the MULTIMODAL PERCEPTION frame.

LEXEME	PS	<i>f</i> SM	<i>nf</i> SM	<i>f</i> NKJP	<i>nf</i> NKJP	p-value	LL	Log Ratio
<i>lekki</i> 'light'	ADJ	229	169.416	13,455	0.560	p < 0.0001	+ 2155.70	8.24
<i>ciężki</i> 'heavy'	ADJ	82	60.664	27,146	1.130	p < 0.0001	+ 492.02	5.753
<i>zbalansowany</i> 'balanced'	ADJ	25	18.495	0	0	p < 0.0001	+ 489.27	inf
<i>lekko</i> 'lightly'	ADV	70	51.786	11,841	0.492	p < 0.0001	+ 485.84	6.44
<i>głęboki</i> 'deep'	ADJ	56	41.429	16,282	0.677	p < 0.0001	+ 350.28	5.93
<i>lekkość</i> 'lightness'	N	22	16.275	935	0.038	p < 0.0001	+ 221.17	8.71
<i>solidny</i> 'sturdy'	ADJ	25	18.495	4,958	0.206	p < 0.0001	+ 175.20	6.49
<i>głębka</i> 'depth'	N	27	19.974	7,483	0.311	p < 0.0001	+ 171.43	6.00
<i>wyważony</i> 'balanced'	ADJ	8	5.918	0	0	p < 0.0001	+ 156.56	inf
<i>płaski</i> 'flat'	ADJ	18	13.316	4,392	0.182	p < 0.0001	+ 118.79	6.19
<i>gęsty</i> 'dense'	ADJ	17	12.576	6,923	0.288	p < 0.0001	+ 95.12	5.45
<i>zwiewny</i> 'weightless'	ADJ	7	5.178	350	0.014	p < 0.0001	+ 68.13	8.47
<i>równowaga</i> 'balance'	N	12	8.877	7,304	0.304	p < 0.0001	+ 57.78	4.87
<i>toporny</i> 'clumpy'	ADJ	5	3.699	271	0.011	p < 0.0001	+ 47.87	8.36
<i>konsystencja</i> 'consistency'	N	5	3.699	539	0.022	p < 0.0001	+ 41.06	7.36
<i>plytki</i> 'shallow'	ADJ	7	5.178	2,963	0.123	p < 0.0001	+ 38.64	5.39
<i>leciutki</i> 'light DIM'	N	4	2.959	310	0.012	p < 0.0001	+ 35.46	7.84
<i>masywny</i> 'massive'	N	4	2.959	1,220	0.050	p < 0.0001	+ 35.46	7.84
<i>ciężar</i> 'heaviness'	N	6	4.438	9,010	0.375	p < 0.0001	+ 18.66	3.56
<i>głęboko</i> 'deeply'	ADV	4	2.959	12,548	0.522	p < 0.0001	+ 7.28	2.50

The LUs that most frequently evoke the **HEARING**, **MULTIMODAL PERCEPTION**, **SMELL**, **TASTE**, **TOUCH**, and **VISION** frames and non-perceptual frames satisfy the condition laid down for obtaining statistical

- A word has the same relative frequency in A and B—the binary log of the ratio is 0
- A word is 2 times more common in A than in B—the binary log of the ratio is 1
- A word is 4 times more common in A than in B—the binary log of the ratio is 2
- A word is 8 times more common in A than in B—the binary log of the ratio is 3
- A word is 16 times more common in A than in B—the binary log of the ratio is 4
- A word is 32 times more common in A than in B—the binary log of the ratio is 5

(<http://cass.lancs.ac.uk/log-ratio-an-informal-introduction/>).

Tab. 52: Keywords that most frequently evoke the SMELL frame.

LEXEME	PS	<i>f</i> SM.	<i>nf</i> SM	<i>f</i> NKJP	<i>nf</i> NKJP	p-value	LL	Log Ratio
<i>perfumy</i> ‘perfume’	N	97	71.761	1,856	0.077	p < 0.0001	+ 1126.99	9.86
<i>zapach</i> ‘smell’	N	392	290.005	11,284	0.469	p < 0.0001	+ 4241.34	9.27
<i>aromat</i> ‘aroma’	N	98	72.501	1,072	0.044	p < 0.0001	+ 1244.45	10.67
<i>zapachowy</i> ‘fragrant’	ADJ	46	34.031	574	0.023	p < 0.0001	+ 572.51	10.48
<i>pachnidło</i> ‘perfume arch.’	N	36	26.633	164	0.006	p < 0.0001	+ 516.00	11.93
<i>woń</i> ‘scent’	N	40	29.592	2,020	0.084	p < 0.0001	+ 388.51	8.46
<i>pachnieć</i> ‘to smell IPFV’	V	32	23.673	6,722	0.279	p < 0.0001	+ 220.63	6.40
<i>aromatyczny</i> ‘aromatic’	ADJ	12	8.877	666	0.027	p < 0.0001	+ 114.31	8.32
<i>pachnący</i> ‘odorous’	ADJ	14	10.357	2,749	0.114	p < 0.0001	+ 98.39	6.50
<i>olfaktoryczny</i> ‘olfactory’	ADJ	5	3.699	0	0	p < 0.0001	+ 97.85	inf
<i>aromatycznie</i> ‘aromatically’	ADV	2	1.479	5	0.001	p < 0.0001	+ 30.77	12.80
<i>wonny</i> ‘scented’	ADJ	3	2.219	501	0.020	p < 0.0001	+ 22.04	6.73
<i>trąący</i> ‘smelly’	ADJ	1	0.739	0	0	p < 0.0001	+ 19.57	inf
<i>wwąchać się</i> ‘to sniff into’	V	1	0.739	0	0	p < 0.0001	+ 19.57	inf
<i>odór</i> ‘fedor’	N	2	1.479	748	0.031	p < 0.0001	+ 11.52	5.57
<i>wąchać</i> ‘to sniff’	V	2	1.479	839	0.034	p < 0.0001	+ 11.07	5.40
<i>smrodek</i> ‘stench DIM’	N	1	0.739	76	0.003	p < 0.0001	+ 8.90	7.87
<i>zapaszek</i> ‘smell DIM’	N	1	0.739	94	0.003	p < 0.0001	+ 8.48	7.56
<i>stęchły</i> ‘musty’	ADJ	1	0.739	170	0.007	p < 0.0001	+ 7.31	6.71
<i>pachnąć</i> ‘to smell NPFV’	V	2	1.479	4,877	0.203	p < 0.001	+ 4.49	2.87
<i>smród</i> ‘stench’	N	1	0.739	2,050	0.085	p < 0.01	+ 2.55	3.12

significance (p-value < 0.01). The most frequent are adjectives (67 lexemes—48 %) and nouns (61 lexemes—44 %). Adverbs and verbs are remarkably rare on the list of most frequent lexemes in the corpus—six lexemes (4 %) and five lexemes (4 %), respectively. It should be emphasized that some nouns on the list are deadjectival nouns (16 lexemes) and gerunds (two lexemes). Since this fact might be important in verifying the hypothesis about the link between grammatical forms of

Tab. 53: Keywords that most frequently evoke the TASTE frame.

LEXEME	PS	<i>f</i> SM	<i>nf</i> SM	<i>f</i> NKJP	<i>nf</i> NKJP	p-value	LL	Log Ratio
<i>słodki</i> 'sweet'	ADJ	113	83.598	5,956	0.247	p < 0.0001	+ 1087.98	8.40
<i>gorzyczka</i> 'bitter flavor'	N	60	44.388	135	0.005	p < 0.0001	+ 933.53	12.95
<i>słodczyk</i> 'sweetness'	N	77	56.965	3,504	0.145	p < 0.0001	+ 763.70	8.61
<i>kwasowość</i> 'acidity'	N	40	29.592	75	0.003	p < 0.0001	+ 634.23	13.21
<i>smak</i> 'taste'	N	77	56.965	9,192	0.382	p < 0.0001	+ 616.86	7.22
<i>świeży</i> 'fresh'	ADJ	36	26.633	9,208	0.383	p < 0.0001	+ 234.25	6.12
<i>posmak</i> 'aftertaste'	N	18	13.316	477	0.019	p < 0.0001	+ 197.68	9.39
<i>cierpki</i> 'tart'	ADJ	17	12.576	569	0.023	p < 0.0001	+ 178.90	9.05
<i>kwaskowaty</i> 'tangy'	ADJ	12	8.877	63	0.002	p < 0.0001	+ 168.90	11.72
<i>wytrawny</i> 'dry'	ADJ	18	13.316	1,262	0.052	p < 0.0001	+ 163.15	7.99
<i>gorzyczkowy</i> 'bitter'	ADJ	13	9.617	160	0.006	p < 0.0001	+ 162.14	10.50
<i>słodko</i> 'sweetly'	ADV	16	11.836	821	0.034	p < 0.0001	+ 154.90	8.44
<i>cierpkość</i> 'sourness'	N	10	7.398	42	0.001	p < 0.0001	+ 144.80	12.05
<i>słodkawy</i> 'sweetish'	ADJ	10	7.398	230	0.009	p < 0.0001	+ 99.48	9.44
<i>pikantny</i> 'spicy'	ADJ	10	7.398	549	0.022	p < 0.0001	+ 95.48	8.34
<i>słodkość</i> 'sweetness'	N	9	6.658	343	0.014	p < 0.0001	+ 92.41	8.86
<i>kwaśny</i> 'sour'	ADJ	11	8.137	1,974	0.082	p < 0.0001	+ 79.26	6.63
<i>smakowy</i> 'gustatory'	ADJ	8	5.918	601	0.025	p < 0.0001	+ 71.42	7.89
<i>gorzki</i> 'bitter'	ADJ	11	8.137	3,291	0.137	p < 0.0001	+ 68.19	5.89
<i>gorzycz</i> 'bitterness'	N	9	6.658	2,797	0.116	p < 0.0001	+ 55.12	5.84

sources and targets in metaphorical expressions, I used standardized Pearson residuals to compare the frequency of different types of nouns: proper names (PN), common nouns (CN), deadjectival nouns—*nomina essendi* (NE)—and deverbal nouns—gerunds (G). The chi-squared test results are as follows: $\chi^2 = 696.03$, $df = 18$, $p\text{-value} < 0.0001$, Cramer's $V = 0.211$ (see Tab. 57).

The biggest set of proper names is linked to the **SMELL** frame; a fewer proper names are linked to the **HEARING** and **TASTE** frames. **MULTIMODAL PERCEPTION**, **TOUCH**, and **VISION** frames are characterized by the biggest set of deadjectival nouns. Deverbal nouns most frequently evoke non-perceptual frames and the **TOUCH** frame. Common nouns most often activate non-perceptual frames. The Pearson correlation coefficient (r) and Kendall rank correlation coefficient (τ) show some significant results. There is a significant positive correlation between the number of proper names and the number of target frames: $r = 0.987$, $t = 12.625$, $df = 4$, $p\text{-value} = 0.0001$;

Tab. 54: Keywords that most frequently evoke the TOUCH frame.

LEXEME	PS	<i>f</i> SM	<i>nf</i> SM	<i>f</i> NKJP	<i>nf</i> NKJP	p-value	LL	Log Ratio
<i>delikatny</i> 'delicate'	ADJ	106	78.419	6,855	0.285	p < 0.0001	+ 977.74	8.10
<i>ciepły</i> 'warm'	ADJ	76	56.225	24,007	0.999	p < 0.0001	+ 463.01	5.81
<i>ostrzy</i> 'sharp'	ADJ	68	50.307	16,131	0.671	p < 0.0001	+ 452.55	6.23
<i>miękki</i> 'soft'	ADJ	32	23.673	5,653	0.235	p < 0.0001	+ 231.57	6.65
<i>gładki</i> 'smooth'	ADJ	31	22.934	3,072	0.127	p < 0.0001	+ 259.77	7.49
<i>aksamitny</i> 'velvety'	ADJ	28	20.714	880	0.036	p < 0.0001	+ 298.12	9.14
<i>ciepło</i> 'warmth'	N	28	20.714	14,164	0.589	p < 0.0001	+ 144.85	5.13
<i>chłodny</i> 'cool'	ADJ	25	18.495	6,295	0.262	p < 0.0001	+ 163.44	6.14
<i>suchy</i> 'dry'	ADJ	24	17.755	9,329	0.388	p < 0.0001	+ 136.47	5.51
<i>delikatnie</i> 'delicately'	ADV	21	15.535	4,686	0.195	p < 0.0001	+ 142.29	6.32
<i>zimny</i> 'cold'	ADJ	16	11.836	19,247	0.801	p < 0.0001	+ 56.32	3.88
<i>chłód</i> 'chill'	N	12	8.877	3,437	0.143	p < 0.0001	+ 75.41	5.96
<i>prześnięty</i> 'soaking'	ADJ	9	6.658	593	0.024	p < 0.0001	+ 82.68	8.08
<i>szorstki</i> 'rough'	ADJ	9	6.658	1,136	0.047	p < 0.0001	+ 71.11	7.14
<i>aksamitność</i> 'velvetiness'	N	9	6.658	7	0.001	p < 0.0001	+ 154.21	14.48
<i>ostrość</i> 'sharpness'	N	8	5.918	1,278	0.053	p < 0.0001	+ 59.48	6.80
<i>gorący</i> 'hot'	ADJ	7	5.178	13,412	0.558	p < 0.0001	+ 18.69	3.21
<i>lepki</i> 'sticky'	ADJ	7	5.178	1,247	0.051	p < 0.0001	+ 50.54	6.64
<i>puchaty</i> 'fluffy'	ADJ	7	5.178	162	0.006	p < 0.0001	+ 78.73	9.58
<i>ostro</i> 'sharply'	ADV	7	5.178	6,929	0.288	p < 0.0001	+ 27.20	4.17

$\tau = 0.745$, $z = 2.013$, $p\text{-value} = 0.022$. Likewise, there is a significant positive correlation between the number of common nouns and the number of target frames: $r = 0.819$, $t = 2.859$, $df = 4$, $p\text{-value} = 0.022$; $\tau = 0.6$, $T = 12$, $p\text{-value} = 0.068$. The number of gerunds and the number of source frames are also positively correlated: $r = 0.820$, $t = 2.870$, $df = 4$, $p\text{-value} = 0.022$; $\tau = 0.690$, $z = 1.912$, $p\text{-value} = 0.027$.

5.2 Grammar of metaphorical units

As mentioned previously, according to the assumptions of CMT, a metaphor operates primarily on the conceptual level. Therefore, the analysis of conceptual metaphors typically ignores linguistic forms of metaphorical expressions that

Tab. 55: Keywords that most frequently evoke the VISION frame.

LEXEME	PS	<i>f</i> SM	<i>nf</i> SM	<i>f</i> NKJP	<i>nf</i> NKJP	p-value	LL	Log Ratio
<i>tło</i> 'background'	N	87	64.363	14,574	0.606	p < 0.0001	+ 638.70	6.73
<i>wysoki</i> 'tall, high'	ADJ	70	51.786	99,603	4.146	p < 0.0001	+ 224.64	3.64
<i>czysty</i> 'clean'	ADJ	57	42.169	22,905	0.953	p < 0.0001	+ 320.41	5.47
<i>barwa</i> 'color'	N	41	30.332	11,338	0.472	p < 0.0001	+ 260.49	6.01
<i>pojawić się</i> 'to appear'	V	41	30.332	32,916	1.370	p < 0.0001	+ 175.62	4.47
<i>niski</i> 'short'	ADJ	40	29.592	22,433	0.933	p < 0.0001	+ 198.92	4.99
<i>wyrazisty</i> 'distinct'	ADJ	35	25.893	2,005	0.083	p < 0.0001	+ 331.23	8.28
<i>mroczny</i> 'obscure'	ADJ	33	24.413	3,213	0.133	p < 0.0001	+ 277.68	7.51
<i>wyraźny</i> 'distinct'	ADJ	31	22.934	12,088	0.503	p < 0.0001	+ 176.08	5.51
<i>kolor</i> 'color'	N	27	19.974	19,904	0.828	p < 0.0001	+ 120.06	4.59
<i>zielony</i> 'green'	ADJ	23	17.015	26,446	1.101	p < 0.0001	+ 82.90	3.95
<i>szeroki</i> 'wide'	ADJ	20	14.796	19,720	0.821	p < 0.0001	+ 77.87	4.17
<i>cień</i> 'shadow'	N	20	14.796	14,714	0.612	p < 0.0001	+ 89.01	4.59
<i>prosty</i> 'straight'	ADJ	19	14.056	44,713	1.861	p < 0.0001	+ 43.85	2.92
<i>długi</i> 'long'	ADJ	18	13.316	47,980	1.997	p < 0.0001	+ 37.70	2.74
<i>jasny</i> 'bright'	ADJ	18	13.316	38,476	1.601	p < 0.0001	+ 44.57	3.06
<i>ciemny</i> 'dark'	ADJ	15	11.097	18,371	0.764	p < 0.0001	+ 52.30	3.86
<i>krótki</i> 'short'	ADJ	13	9.617	32,515	1.353	p < 0.0001	+ 28.63	2.83
<i>odcień</i> 'shade'	N	13	9.617	2,545	0.105	p < 0.0001	+ 91.44	6.50
<i>mrok</i> 'obscurity'	N	12	8.877	4,400	0.183	p < 0.0001	+ 69.60	5.60

appear in texts. Nevertheless, there are researchers who note that the grammar of verbal metaphor is not accidental and should not be ignored. Soskice (1985: 19) argues that a lot of disputes over metaphor are rooted in the fact that researchers rarely specify whether they are referring to the syntactic form of a metaphor or of its logical structure, and—on top of all that—they often confuse the two. Soskice claims that the *X is Y* structure of metaphorical expressions implies that, from a grammatical point of view, metaphor is always an assertion and its vehicle is always a predicate. By contrast, Soskice believes that metaphor does not manifest itself in one specific form, since it is identified not only on the basis of syntactic criteria, but also on semantic and pragmatic ones. Strik Lievers (2015) writes that “the typical expression of conventionalised synaesthetic expressions is a noun phrase composed of an adjective providing the source and a noun as the target, as in *warm colour*” (87). She hypothesizes that if, in most cases,

Tab. 56: Keywords that most frequently evoke non-perceptual frames.

LEXEME	PS	<i>f</i> SM	<i>nf</i> SM	<i>f</i> NKJP	<i>nf</i> NKJP	p-value	LL	Log Ratio
<i>baza</i> 'base'	N	108	77.679	19,298	0.803	p < 0.0001	+ 751.62	6.60
<i>serce</i> 'heart'	N	86	62.143	41,550	1.729	p < 0.0001	+ 438.19	5.17
<i>finisz</i> 'finish'	N	84	58.444	1,043	0.043	p < 0.0001	+ 974.65	10.39
<i>głowa</i> 'head'	N	76	56.225	95,591	3.979	p < 0.0001	+ 261.22	3.82
<i>klimat</i> 'climate'	N	50	36.990	9,594	0.399	p < 0.0001	+ 353.66	6.53
<i>materiał</i> 'fabric'	N	41	30.332	36,856	1.534	p < 0.0001	+ 166.80	4.31
<i>kawalek</i> 'piece'	N	35	25.153	14,413	0.600	p < 0.0001	+ 187.58	5.39
<i>pełny</i> 'full'	ADJ	33	24.413	86,889	3.617	p < 0.0001	+ 69.79	2.75
<i>bogaty</i> 'rich'	ADJ	32	23.673	16,469	0.685	p < 0.0001	+ 164.47	5.11
<i>character</i> 'character'	ADJ	32	23.673	46,516	1.936	p < 0.0001	+ 101.44	3.61
<i>moc</i> 'power'	N	28	20.714	24,949	1.038	p < 0.0001	+ 114.38	19.94
<i>agresywny</i> 'aggressive'	ADJ	25	18.495	5,649	0.235	p < 0.0001	+ 168.77	6.30
<i>mieszanka</i> 'mixture'	N	25	18.495	24,949	1.038	p < 0.0001	+ 207.89	7.44
<i>otwarcie</i> 'opening'	N	25	18.495	18,675	0.777	p < 0.0001	+ 110.53	4.57
<i>silny</i> 'strong'	ADJ	22	16.275	27,467	1.143	p < 0.0001	+ 75.92	3.83
<i>dawka</i> 'dose'	N	20	14.796	3,397	0.141	p < 0.0001	+ 146.28	6.71
<i>łagodny</i> 'gentle'	ADJ	20	14.796	5,318	0.221	p < 0.0001	+ 128.61	6.06
<i>elegancki</i> 'elegant'	ADJ	18	13.316	5,381	0.224	p < 0.0001	+ 111.61	5.89
<i>zmysłowy</i> 'sensual'	ADJ	18	13.316	1,493	0.062	p < 0.0001	+ 157.17	7.74

nouns are targets and adjectives are sources, then “it should follow that senses richer in nouns are more likely to be targets, while senses richer in adjectives are more likely to be sources” (Strik Lievers 2015: 87). Likewise, Ronga (2016: 48) notes that synesthetic metaphors in most cases contain a head, which is typically a noun, and a modifier, which is most often an adjective. The multiformity of metaphors in texts is also noted by Goatly (1997) and Cameron (2003). It follows clearly from Goatly’s (1997) analysis of examples from the literature and the *Bank of English* that metaphors are expressed not only by nouns, but by other parts of speech as well. Some analyses show that verbs are more frequently used metaphorically (to evoke metaphorical source domains) than nouns (Cameron 2003; Deignan 2005; Praggeljaz Group 2007; Steen *et al.* 2010; Sullivan 2018). Cameron (2003: 88–89) compares the number of metaphors expressed by different linguistic forms, which enables her to determine that almost 50 % of metaphors come in the form of verbs. Metaphorical expressions involving nouns (of the type A=B, e.g., *Man is a wolf*) make up no more than 5 % of the corpus.

Tab. 57: Standardized Pearson residuals of noun types evoking perceptual and non-perceptual frames (p-value < 0.0001).

FRAMES	PN	CN	NE	G
HEARING	6.501	-0.964	-3.566	-2.553
MULTIMODAL PERCEPTION	-2.564	-3.112	6.803	1.342
SMELL	17.638	-4.661	-6.109	-7.089
TASTE	5.901	-1.362	-0.225	-4.268
TOUCH	-2.564	-3.464	4.473	3.916
VISION	-4.899	-0.217	5.566	0.758
NON-PERCEPTUAL FRAMES	-17.883	6.908	1.599	8.059

Deignan (2005: 178) restricts her research on the ways metaphors are expressed to lexemes involving the domain of plants; more precisely, she focuses on the English word *blossom*, which may either be a collective noun denoting ‘flowers’, or a verb meaning ‘to produce flower(s)’. As she reports, the noun was used 167 times for the literal meaning and only twice in the figurative sense; the verb was used five times in its literal meaning and as many as 55 times for the figurative meaning. Furthermore, Sullivan argues that:

[...] syntactic regularities in metaphors language show that there are aspects of grammar that affect metaphoric language regardless of the conceptual metaphor involved. The linguistic and conceptual trends in metaphoric language demonstrate that its structure needs to be modeled in terms of both language and cognition. (12)

Dancyngier and Sweetser (2014) and Sullivan (2013, 2018), in their analyses of the grammatical form of metaphor, refer to Langacker’s concept of conceptual autonomy and conceptual dependence. According to Langacker (1987, 1990, 1991), modification constructions exhibit asymmetry of conceptual dependency: the head is more autonomous and the modifier is semantically more dependent: e.g., in nominal phrases, a noun is more independent than its modifier (typically, an adjective) and in verbal phrases, the verb is more independent than a modifying adverb. Langacker argues that for predicative-argument constructions, the semantic asymmetry is reversed—in this case, the head (i.e., predicate) is more dependent, while its arguments are more autonomous. Based on Langacker’s idea, Sullivan (2013) proposes the *Autonomy-Dependence Constraint*: “in a metaphorical phrase or clause that can be understood out of context, every source-domain item must be conceptually dependent relative to at least one autonomous target-domain item” (135). Sullivan (2018: 13) claims that a metaphorical sentence needs a combination of

metaphorical verb and non-metaphorical nouns. In verbal metaphors, conceptual autonomy and dependence specify how a conceptual metaphor should be evoked. According to Sullivan (2018: 17), semantically autonomous elements typically evoke the target domain of a metaphor. Langacker's proposition of semantic asymmetry in predicative-argument constructions highlights the weakness of traditional syntax and semantics, which claims that the core of a sentence is a verb. The predicate-oriented approach comes from Tesnière's model of syntactic valency. On his theory, verbs are the core of a sentence and their valency is solely a property of each verb. Likewise, Fillmore (1968) claims that a verb selects a certain number of deep cases that form its case frame. In contrast, Kiklewicz (2007) considers a noun to be key to the semantic interpretation of discourse. Gentner's (1982) analysis of language acquisition shows that children learn nouns much faster and easier than verbs. She notes that the concepts of objects are more naturally intuitive and come directly from the perceived world, while predicates as relational concepts are more complex and need a language system as background in order to be understood. Gentner and Boroditsky (2001) posit the Division of Dominance (embracing both cognitive and linguistic dominances)—on one extreme are concrete nouns, which follow cognitive-perceptual dominance, since they denote objects on a cognitive-perceptual basis. Szwedek's (2012) hypothesis of objectification "according to which abstract entities are conceptualized metaphorically in terms of physical objects, the domain of which is the ultimate domain, i.e., subject to no further metaphorization" (214) also supports the supremacy of nouns over verbs. Szwedek argues that the primacy of nouns stems from the independent nature of objects that they denote. In contrast, verbs refer to relations between objects; therefore, they are dependent.

The results of statistical analysis of activators in Synamet support the assumption that adverbs and adjectives (i.e., modifiers) more often evoke source frames. There is a significant difference between perceptual and non-perceptual frames with respect to parts of speech (see Tab. 47)—non-perceptual frames exhibit more verbs and fewer nouns than perceptual frames. Since, in Synamet, the elements of non-perceptual frames are rarely targets, one can assume that non-perceptual frames are typically sources and for that reason they are predominantly activated by verbs.

The statistics concerning activators of perceptual frames also support the assumptions of Strik Lievers (2015) and Ronga (2016). The **SMELL** frame, which is an ultimate target frame, is evoked by the largest set of nouns, while the **MULTIMODAL PERCEPTION**, **TOUCH**, and **VISION** frames, which serve typically as sources, have the fewest evoking nouns. On the other hand,

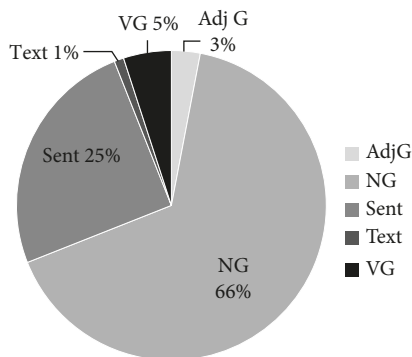


Fig. 27: Grammatical forms of metaphorical units in Synamet.

those frames exhibit numerous modifiers—many verbs evoke the **VISION** and **TOUCH** frames, while adverbs are characteristic of the **MULTIMODAL PERCEPTION** frame. Likewise, all three frames are quite frequently evoked by adjectives. The correlation tests show that there is a strong positive correlation between the number of verbs and the number of source frames. Likewise, the tests confirm that the number of the target frames and the number of nouns in total, proper names, and common nouns are positively correlated.

On the other hand, the analysis of Synamet also provides arguments against Sullivan's assumption that a verb is typically a vehicle of metaphoricity. The annotation of MUs in the corpus included not only grammatical descriptions of activators, but also descriptions of MUs' grammatical forms. The analysis shows that nominal phrases are the most frequent (5337 MUs), while sentences are less so (2005 MUs). Verbal phrases comprise only 369 MUs (see Fig. 27).

Therefore, MUs in form of nominal phrases comprise more than half of all MUs in the corpus. Moreover, verbs as activators are infrequent in Synamet. The nouns provide 49 % of all activators and the adjectives provide 31 %, while the verbs comprise only 16 % of activators in the corpus. The analysis of verbs evoking frames, which typically serve as sources (i.e., **MULTIMODAL PERCEPTION**, **TOUCH**, and **VISION** frames), shows quite significant differences—the largest resource of verbs activates the **VISION** frame and considerably fewer verbs evoke the **TOUCH** frame. The number of verbs that activate the **MULTIMODAL PERCEPTION** frame is not statistically significant. The prevalence of verbs that evoke the **VISION** frame might be explained differently—the lexical field of verbs of visual perception in Polish is the most evolved, diversified, and numerous of the lexical fields of perception. Furthermore, the

most frequent keywords in Synamet are mostly adjectives (48 %) and nouns (44 %). Only 4 % of keywords are verbs.

The claim that all nouns in verbal metaphors evoke elements of target frames is by far too categorical and needs to be amended. Yet another factor should be taken into consideration—the type of noun. During the analysis of activators in Synamet, four main types of nouns were tested—common (typically concrete) nouns, proper names, deadjectival nouns (*nomina essendi*), and deverbal nouns (gerunds). An interesting feature of non-perceptual and perceptual frames, typically serving as sources, is the predominance of deadjectival nouns (perceptual source frames) and deverbal nouns (non-perceptual source frames). The Pearson and Kendall tests show a significant positive correlation between the number of deverbal nouns and the number of source frames. Deadjectival and deverbal nouns deserve more attention since they differ from their radicals. Although they still refer to a feature of an object (like adjectives) or action (like verbs), they behave differently in a sentence. According to Halliday (1998), nominal groups “are the more stable elements on the experiential scene which tend to persist through time, whereas the processes themselves are evanescent” (197). Mihatsch (2009: 78–79) emphasizes the fact that nouns are syntactically and conceptually more autonomous than verbs or adjectives. He notes that nouns can express all kinds of concepts; thus, the class of nouns is more open to borrowing and is more flexible with respect to innovation than verbs or adjectives. Moreover, nouns possess a reifying force. In fact, changing a grammatical form (from an adjective or a verb to a noun) can be interpreted as metaphorization (Halliday 1985, 1998; Ritchie and Zhu 2015). Langacker (2010) claims that a noun profiles a thing, “in an abstract and broadly inclusive sense of that term” (45). He defines “a thing” as “any product of grouping and reification”. Therefore, deverbal or deadjectival nouns evoking source frames can become heads of noun phrases, while their modifiers express targets; see examples (17)–(20).

- (17) Postanowili przełamać/stonować ostrość drzewno-żywnicznych nut słodyczą.
 ‘They decided to break/to tone **a sharpness** (N—the TOUCH source frame) of **wooden and resinous** (ADJ—the SMELL target frame) notes with **a sweetness** (N—the TASTE source frame).’
- (18) Początek [zapachu] przypomina trochę ekstrakt z lekko przepoconej miniówki Dody.
 ‘**The beginning** (N—the EVENT source frame) [of a smell] a little bit resembles an extract of Doda’s³⁴ slightly sweaty miniskirt.’

34 Polish pop-singer.

- (19) Będzie to mocny rockowy kopniak.
‘It will be a strong **rock** (ADJ)—the **HEARING** target frame) **kick** (N—the **PERSON** source frame).’
- (20) goryczka heliotropu
‘a **bitterness** (N—the **TASTE** source frame) of a **heliotrope** (dependent N—the **SMELL** target frame)’

Source frames can also be evoked in metaphorical phrases by common nouns; see examples (21)–(23).

- (21) Lenny Kravitz osiągnął ogromny sukces komercyjny głównie za sprawą smakowitej mieszanki popu z rockiem okraszanej rytmemi funky.
‘Lenny Kravitz achieved enormous commercial success mainly as a result of a **delicious mixture** (N—the **TASTE** source frame) of **pop and rock** (dependent N—the **HEARING** target frame), sugarcoated with funky rhythms.’
- (22) Peleton porządných win trzymał się jednak blisko.
‘The **peloton** (N—the **SPORT** source frame) of decent wines stayed close.’
- (23) Pozwól, aby jedwabne wstążki perfum zawiązały Ci dłonie i usta i mówiły jedynie zapachem...
‘Let the **silk ribbons** (N—the **CLOTHES** source frame) of **perfume** (dependent N—the **SMELL** target frame) bind your hands and let them speak with a smell only...’

Other exceptions to the principle proposed by Sullivan (2013, 2018) are catachresis and metaphorical word formations, e.g., (24)–(25).

- (24) Charakterystycznej, bogatej, egzotycznej **nuty** męzczenicy nie ma tu właściwie wcale.
‘Basically, there is none whatsoever of the characteristic, rich, exotic **note** of a passion fruit.’
- (25) Kontynuując opowieść o jesiennych **otulaczach**, napiszę Wam o jednym z nich — różanym.
‘To continue a story about autumn **wrappers**, I will write about one of them—the rosy one.’

In (24), the author uses the noun *nuta* ‘note’, which is already a metaphor—it is an olfactory impression of a single scent. Therefore the **HEARING** frame is the source and the **SMELL** frame is the target. In (25), the author creates a nominal neologism *otul-acz* ‘wrap-er’ which is a derivative from the verb *otulać* ‘to wrap’ with the suffix *-acz*, and it means ‘a perfume that smells as if they wrapped a body’. In this example, the source is the **CLOTHES** frame and the target is the **SMELL** frame.

The Autonomy-Dependence Constraint posited by Sullivan (2013, 2018) is an important observation and the analysis of the Synamet corpus mainly supports it; however, it should be supplemented by information of the noun type (e.g., proper names always evoke targets, while gerunds or deadjectival nouns can represent sources). Furthermore, catachresis should be excluded from this constraint.

Analysis of activators of frames in MUs bring yet another interesting result. According to Cameron (2011), metaphorical topics (what a metaphor is used to talk about, i.e., targets)—are not often found in discourse, while vehicle terms (i.e., sources) “tend to be used on their own in the flow of talk” (37). Quite surprisingly, the ultimate target in Synamet—the **SMELL** frame—is activated by the largest set of lexical items (458). Perceptual frames, which are typically sources (**TOUCH**, **MULTIMODAL PERCEPTION**, and **VISION**), exhibit a much smaller set of lexemes. There is also a positive correlation between the number of target frames and the number of lexemes. The data collected during the analysis of the Synamet corpus is not sufficient to make any explicit claims about the scope of targets evoked in texts; the problem requires more detailed and broad study in the future.

5.3 Semantic factors in metaphorical units' creation

The analysis of metaphor according to CMT usually does not take semantic differences between close synonyms into consideration. Sullivan (2006) draws attention to this serious deficiency in metaphor studies. She notes that many semantically similar lexical items have different metaphorical meanings—for example, synonymic adjectives and adverbs referring to light or to the lack of light (e.g., *bright*, *brilliant*, *sunny*, *clear*, *dim*, *dark*) are used in different conceptual metaphors KNOWING IS SEEING (e.g., *a brilliant idea*) or HAPPINESS IS LIGHT (e.g., *a sunny mood*). She posits that “the frames evoked by lexical items' non-metaphoric senses can determine which items are chosen to express a given conceptual metaphor” (Sullivan 2006: 387). Even though these lexical items are synonyms, Sullivan suggests that they evoke different frames, e.g., the adjective *brilliant* can refer metaphorically to exceptional intelligence because in literal uses the lexical item means a light emitted from a source (e.g., *a brilliant star*, *a brilliant torch*)—and it evokes frames LIGHT-EMISSION and LIGHT_MOVEMENT. In contrast, the adjective *sunny* is never used in such metaphors as it evokes a different frame—LOCATION_OF_LIGHT (Sullivan 2006: 391–394). The idea put forth by Sullivan is essential for the analysis of the keywords in Synamet. The lexical items that exhibit high frequencies in the corpus are much less frequent in general Polish (based on the data from NKJP, see Tabs 50–56),

while their synonyms, which are more frequent in NKJP, are less preferred in MUs. In this section, I analyze pairs of semantically close lexemes *chłodny* ‘cool’ and *zimny* ‘cold’ and *ciemny* ‘dark’ and *mroczny* ‘dark, obscure’, which have different frequencies in Synamet and NKJP, and I look for semantic factors that might have an impact on a MU’s lexical shape. In my analysis, I use the search engines PELCRA and KOŁOZAUROS in the HASC collocation databases (Pęzik 2013).

5.3.1 Comparison of the adjectives *chłodny* ‘cool’ and *zimny* ‘cold’

One of the keywords in Synamet, evoking the TOUCH frame, is the adjective *chłodny* ‘cool’—its frequency in Synamet is 25 (nf 18.495), its frequency in NKJP is 6,295 (nf 0.262), the log likelihood ratio is +163.44 (the adjective is overrepresented in Synamet), and the binary log ratio is 6.14 (the adjective is 64 more times common in Synamet than in NKJP). The adjective *zimny* ‘cold’ has a lower frequency in Synamet than *chłodny* ‘cool’—16 (nf 11.836), but it is more common in NKJP—19,247 (nf 0.801). The log likelihood ratio for *zimny* ‘cold’ is + 56.32 (still significantly overrepresented in Synamet, but not as much as *chłodny* ‘cool’ is) and the binary log ratio is 3.88 (the adjective is almost 16 times more common in Synamet). There is evident preference for the adjective *chłodny* ‘cool’ in the Synamet corpus, see (26)–(28).

(26) Ambra del Nepal³⁵ jest kontrastowo do swej natury wysokogórska, skalista i chłodna.
‘Ambra del Nepal, in contrast with its nature, is alpine, rocky, and cool.’

(27) Zaś zapach³⁶ w nim zamknięty jest jasny i połyskliwy, chłodny i czysty, słowem śnieżnobiały.
‘Again, the aroma encapsulated in a bottle is bright and glittering, cool and clean, in short—snow-white.’

(28) [Kardamon]³⁷ może również przybrać też postać skostniałą, krystalicznie zimną jak ten z Chaosu.³⁸
‘[Cardamon] can also take a frozen form that is crystal-clear like the one of Chaos [perfume].’

35 The perfume by I Profumi di Firenze.

36 The cologne *Iris d'Argent* by Keiko Mecheri.

37 The perfume *Marrakech* by Aesop.

38 The perfume *Chaos* by Donna Karan.

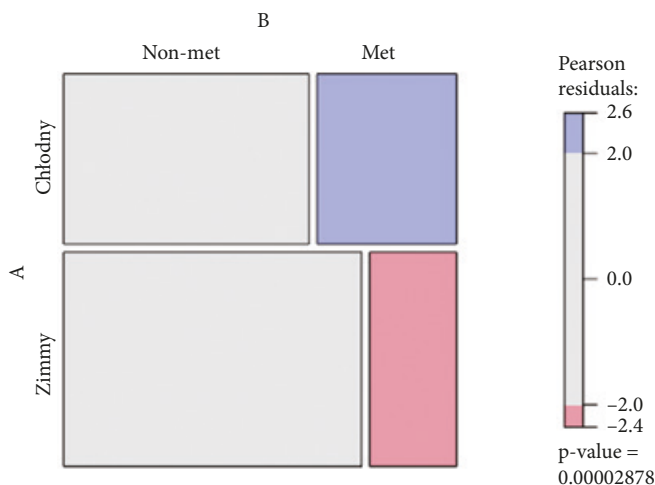


Fig. 28: Pearson residuals of metaphorical and non-metaphorical collocates with the adjectives *chłodny* ‘cool’ and *zimny* ‘cold’ in Synamet.

Tab. 58: Standardized Pearson residuals of *chłodny* ‘cool’ and *zimny* ‘cold’ adjectives in literal and metaphorical collocates (p-value < 0.0001).

ADJECTIVE	Literal collocates	Metaphorical collocates
<i>chłodny</i> ‘cool’	- 4.182	4.182
<i>zimny</i> ‘cold’	4.182	- 4.182

The HASK search engine found 342 collocates for the adjective *chłodny* ‘cool’, of which 124 are metaphorical, and 430 collocates for the adjective *zimny* ‘cold’, of which 97 are metaphorical. The difference is significant—the chi-squared test results are $\chi^2 = 16.833$, $df = 1$, $p\text{-value} < 0.0001$, Cramer’s $V = 0.151$. The standardized Pearson residuals show that the adjective *chłodny* ‘cool’ is more often used in metaphorical collocates, see Fig. 28 and Tab. 58.

The adjective *chłodny* ‘cool’ means that a temperature is lower than usual but not very low, and the adjective *zimny* ‘cold’ refer to a temperature that is lower than usual or very low. The KOŁOZAUROS show that both adjectives are quite similar in their literal senses. They can describe temperature of objects (*chłodny/zimny* metal ‘cold metal’), body parts (*chłodna/zimna ręka* ‘cold hand’), places (*chłodna/zimna piwnica* ‘cold basement’), time of the year or the day (*chłodna/*

zimna wiosna ‘cold spring’, *chłodna/zimna noc* ‘cold night’), beverages (*chłodne/zimne wino* ‘cold wine’), water (*chłodne/zimne morze* ‘cold sea’), air (*chłodny/zimny powiew* ‘cold blast of air’). The only difference is that the adjective *zimny* ‘cold’ is used with nouns referring to the way dishes are served, while the adjective *chłodny* ‘cool’ never occurs in such phrases, e.g., *zimny buffet* ‘cold buffet’ or *zimne przekąski* ‘cold entrees’.

The adjective *chłodny* ‘cool’ can refer to a rather pleasant sensation, e.g., *chłodna bryza* ‘cool breeze’ or *chłodny wietrzyk* ‘cool gentle wind’. The adjective’s collocations with adverbs confirm that *chłodny* ‘cool’ can refer to desirable experiences, e.g., *przyjemnie chłodny* ‘pleasantly cool’ or *cudownie chłodny* ‘lovely cool’. The most typical collections³⁹ consisting of the adjective *chłodny* ‘cool’ support the thesis that the lexeme has ambiguous connotations. On the one hand, the time of the year associated with the adjective *chłodny* ‘cool’ is autumn (*chłodny i jesienny* ‘cool and autumnal’)—September, October, and November—bad, wet, and rainy weather (*dżdżysty i chłodny* ‘rainy and cool’; *pochmurny i chłodny* ‘cloudy and cool’), and darkness (*chłodny i ciemny* ‘cool and dark’, *chłodny i wieczorny* ‘cool and nightly’). On the other hand, the adjective *chłodny* ‘cool’ is also associated with summer (*chłodny i letni* ‘cool and summer’), a breeze (*chłodny i przewiewny* ‘cool and airy, breezy’), shade (*chłodny i zacieniony* ‘cool and shadowed’), or refreshment (*chłodny i orzeźwiający* ‘cool and refreshing’). Other positive features associated with the adjective *chłodny* are *świeży* ‘fresh’, *czysty* ‘clean’, or *jasny* ‘bright’. Names of colors occurring in the collections with the adjective are *zielony* ‘green’ (referring to greenery) and *biały* ‘white’ (referring to snow). Yet another important source for analysis of an adjective’s semantics are lexicalized comparisons, which point to stereotypical vehicles of a particular feature. The adjective *chłodny* ‘cool’ appears in only one comparison—*chłodny jak marmur* ‘cool as marble’ (Bańko 2004: 24). Marble is typically evaluated positively as an expensive, beautiful, and rare material, but it is also associated with the paleness of skin (*marmurowa bladość* ‘marble paleness’), being motionless or frozen (*marmurowa twarz* ‘marble face’), and death (*marmurowy nagrobek* ‘marble tombstone’). The adjective *chłodny* ‘cool’ has three lexicalized metaphorical senses: 1. ‘aloof, not very friendly, lukewarm’, e.g., *chłodne przyjęcie* ‘lukewarm reception’; 2. ‘distant, unemotional person, behavior’, e.g., *chłodny obserwator* ‘distant observer’; and 3. ‘unemotional mental act, analysis’, e.g., *chłodna kalkulacja* ‘cold-hearted calculation’ (Żmigrodzki 2007).

39 Collections are series, coordinate collocates of several similar objects, phenomena, or features. Bartmiński (2001: 128) notes that collections are typical structures for naïve conceptualizations in everyday language.

The adjective *zimny* 'cold' is more often used to describe unpleasant experiences, e.g., *zimny wicher* 'cold storm', and its collocates with adverbs are valued negatively, e.g., *potwornie zimno* 'dreadful cold', *piekielnie zimno* 'hellishly cold', *koszmarnie zimno* 'terrible cold', *okropnie zimno* 'awfully cold', or *cholernie zimno* 'darn cold'. The only exceptions are beverages that are typically expected to be served very cold: *zimna wódka* 'cold vodka' and *zimne piwo* 'cold beer' are evaluated positively. The adjective *zimny* 'cold' in collections collocates with adjectives referring to autumn and winter months—December or February (e.g., *zimny i lutowy* 'cold and wintry'), very cold, wet, foggy, and windy weather (*zimny i lodowaty* 'cold and icy', *zimny i mokry* 'cold and wet', *zimny i śliski* 'cold and slippery', *zimny i porywisty* 'cold and gusty'), darkness (*zimny i mroczny* 'cold and obscure'), a void (*zimny i pusty* 'cold and empty'), or silence (*zimny i cichy* 'cold and silent'). Other adjectives occurring in collections with *zimny* 'cold' are rather negative: *ponury* 'grim', *blady* 'pale', and *martwy* 'dead'. The colors associated with the adjective *zimny* 'cold' are *szary* 'gray' and *biały* 'white'. In comparisons using the adjective, stereotypically cold objects are *lód* 'ice', *kamień* 'stone', *trup* 'corpse', *sopel lodu* 'icicle', *ryba* 'fish', *stal* 'steel', *głaz* 'rock', and *marmur* 'marble' (Bańko 2004: 206). Most of them (except for the noun *stal* 'steel') have rather negative connotations in Polish. The idiom *serce z lodu/kamienia/głazu* (lit. 'heart of ice/stone/rock') means that someone is heartless and deprived of emotions (Żmigrodzki 2007), the phrase *kamień na sercu* (lit. 'a stone on a heart') means that someone is worried, and the expression *rybi charakter* (lit. 'a character of fish') means that someone is emotionless. Only the noun *stal* 'steel' has the positive connotations of physical strength (e.g., the idiom *stalowy uścisk* lit. 'steel handshake' means a very strong handshake) and calmness (e.g., the phrase *nerwy ze stali* lit. 'steel nerves' means self-control in a very stressful situation). The adjective *zimny* 'cold' has more lexicalized metaphorical senses than the adjective *chłodny* 'cool': 1. 'distant and emotionless person'; 2. 'expressing indifference and lack of emotions', e.g., *zimny wzrok* 'cold look'; 3. 'emotionless mental state or act', e.g., *zimny rozsądek* 'cold reason'; 4. 'sexually frigid'; and 5. 'dead' (Żmigrodzki 2007).

Both analyzed adjectives *chłodny* 'cool' and *zimny* 'cold' have similar literal and lexicalized metaphorical senses. The main differences are ambivalent positive and negative connotations of the adjective *chłodny* 'cool' in its literal sense, while the adjective *zimny* 'cold' is rather negatively loaded (there is a strong association of the adjective *zimny* 'cold' with death), and more diversified stereotypical vehicles of coldness with quite strong negative connotations (e.g., ice, stone, fish, corpse).

5.3.2 Comparison of the adjectives *mroczny* ‘dark, obscure’ and *ciemny* ‘dark’

The synonymous adjectives *ciemny* ‘dark’ and *mroczny* ‘dark, obscure’ are keywords in Synamet. Nonetheless, the frequency of *mroczny* ‘dark, obscure’ is much higher—its raw frequency is 33, and the normalized frequency is 24.413, while the raw frequency of *ciemny* ‘dark’ is only 15, and the normalized frequency is 11.097. At the same time, in NKJP, the adjective *ciemny* ‘dark’ occurs more often—its raw frequency is 18,37, and the normalized frequency is 0.764. In contrast, the raw frequency of the adjective *mroczny* ‘dark, obscure’ in NKJP is only 3,213 and the normalized frequency is 0.133. The comparison of the two corpora shows that both adjectives are overrepresented in Synamet but that the difference is much bigger in the case of *mroczny* ‘dark, obscure’—the log likelihood ratio is +277.68 and the binary log ratio is 7.51 (the word is over 128 times more common in Synamet), while for the adjective *ciemny* ‘dark’, the log ratio is +52.30 and the binary log ratio is 3.86 (the word is only 16 times more common in Synamet). The adjective *mroczny* ‘dark, obscure’ is quite prevalent in MUs in Synamet (see (29)-(30)).

(29) Dziki, mroczny kawałek,⁴⁰ z hipnotycznym rytmem, świdrującymi gitarami, porywający, wchłaniający słuchacza.

‘A wild, obscure song with a hypnotic rhythm, drilling guitars, thrilling, gobbling up a listener.’

(30) Zapach⁴¹ jest łagodnie ciemny jak własne wnętrze obserwowane pod zamkniętymi powiekami. Mroczny, jak mroczne zakamarki ludzkiej duszy [...] czarny czernią pełną treści, fascynujący mrokiem, który przyjmie miękko wszystkie najszybsze pragnienia.

(<http://www.sabbathofsenses.com/2008/07/donna-karan-black-cashmere.html>)

‘The aroma is softly dark as my own inwardness observed with closed eyes. As obscure as obscure recesses of a human soul [...] black as blackness full of essence, fascinating as darkness, which softly accepts all innermost desires.’

The HASK search engine found 1,170 collocates with the adjective *ciemny* ‘dark’ and 359 collocates with the adjective *mroczny* ‘dark, obscure’. 162 collocates containing the adjective *ciemny* ‘dark’ are metaphorical, while the adjective *mroczny* ‘dark, obscure’ is used figuratively in 209 collocates. The difference between the metaphorical and non-metaphorical usage of the analyzed

40 The Cure, *One Hundred Years*.

41 The perfume *Black Cashmere* by Donna Karan.

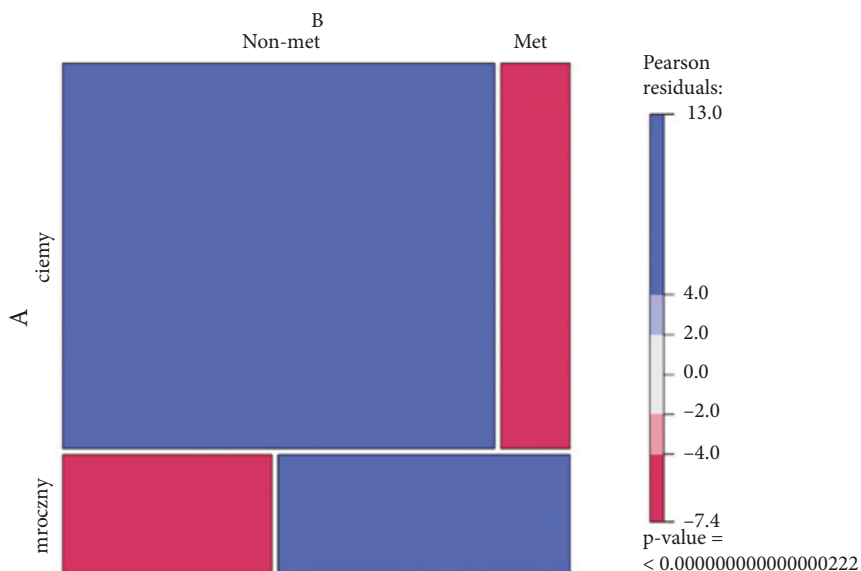


Fig. 29: Pearson residuals of metaphorical and non-metaphorical collocates with the adjectives *ciemny* 'dark' and *mroczny* 'dark, obscure' in Synamet.

Tab. 59: Standardized Pearson residuals of *ciemny* 'dark' and *mroczny* 'dark, obscure' adjectives in the literal and metaphorical collocates (p-value < 0.0001).

ADJECTIVE	Literal collocates	Metaphorical collocates
<i>ciemny</i> 'dark'	17.155	-17.155
<i>mroczny</i> 'dark, obscure'	-17.155	17.155

adjectives is statistically significant—the chi-square test results are $\chi^2 = 291.9$, $df = 1$, $p\text{-value} < 0.0001$, Cramer's $V = 0.439$. The standardized Pearson residuals show that the adjective *mroczny* 'dark, obscure' is much more frequently used in metaphorical collocates (see Fig. 29 and Tab. 59).

According to dictionaries, the adjectives are synonyms in their literal sense 'lacking light, unlit' (Bańko 2000; Dubisz 2003). Moreover, the dictionaries classify the noun *mroczny* 'color' as an example of *literaryism*. Contrary to the dictionaries' definitions, KOŁOZAUROS shows several important differences in the primal usages of the analyzed synonyms. The adjective *ciemny* 'dark' can refer to color or color and light intensity (*ciemny barwnik* 'dark dye', *ciemny*

Tab. 60: Differences in literal senses of the adjectives *ciemny* ‘dark’ and *mroczny* ‘dark, obscure’.

FRAME	ELEMENT	<i>ciemny</i> ‘dark’	<i>mroczny</i> ‘dark, obscure’
LIGHT	SOURCE OF LIGHT	<i>ciemny księżyc</i> ‘dark Moon’	—
	LUMINOUS INTENSITY	<i>ciemne światło</i> ‘dark light’	—
	AMOUNT OF LIGHT	<i>ciemny pokój</i> ‘dark room’	—
	RANGE OF ILLUMINATION	<i>ciemny sufit</i> ‘dark ceiling’	—
	LACK OF LIGHT	<i>ciemna aleja</i> ‘dark alley’	<i>mroczna aleja</i> ‘dark alley’
OBJECT	CONTRAST WITH A BACKGROUND	<i>ciemna sylwetka</i> ‘dark silhouette’	—
	COLOR	COLOR	<i>ciemna skóra</i> ‘dark skin’
COLOR INTENSITY		<i>ciemna czerwień</i> ‘dark red’	—

blond ‘dark blond’, *ciemny brąz* ‘dark brown’, or *ciemne światło* ‘dark light’), while the adjective *mroczny* ‘dark, obscure’ cannot be used in such contexts (see Tab. 60).

According to Sullivan (2006), differences in the literal senses of synonyms can be important factors in their metaphorical usage. She writes that “since metaphoric domains are often structured by multiple frames, different submappings of a metaphor may preserve the structure of different frames” (Sullivan 2006: 389).

Even more differences pertain to metaphors using the analyzed adjectives. The adjective *ciemny* ‘dark’ has several lexicalized metaphorical meanings: 1. ‘low tone, timbre’, 2. ‘suspicious, not trustworthy’, e.g., *ciemny interes* ‘shady business, racket’, 3. ‘uneducated, backward’, e.g., *ciemny lud* ‘ignorant, clueless people’, and 4. ‘unknown, mysterious’, *ciemna kwestia* ‘dark matter’ (Bańko 2000; Dubisz 2003; Żmigrodzki 2007). In the collocates found by the HASK search engine, the adjective *ciemny* ‘dark’ also refers to something bad, evil, e.g., *ciemna strona człowieczeństwa* ‘dark side of humanity’, *ciemna moc* ‘dark force’, and stupidity *ciemna masa* ‘cracker’. *Ciemny* ‘dark’ occurs in collections with following adjectives: *wilgotny* ‘damp’, *zimny* ‘cold’, *chłodny* ‘cool’, *ponury* ‘grim’, *straszny* ‘horrible’, *tajemny* ‘secret’, *zaczofany* ‘backward’, and *niedouczony* ‘uneducated’. The adjective *ciemny* ‘dark’ occurs in the following lexicalized comparisons—*ciemny jak noc/smoła/jak tabaka w rogu* ‘dark as night/pitch/snuff in a horn.’⁴² Night has ambiguous connotations. It is associated

42 In olden times, nobles in Poland carried snuff in horns.

with dark forces, e.g., *noc Walpurgii*⁴³ 'night of Saint Walpurga' or with bad times, e.g., *noc stalinowska* 'Stalinist night', or *noc okupacji* 'night of occupation'. At the same time, night strongly connote sex and love, e.g., *noc Kupały*⁴⁴ 'midsummer night', *noc poślubna* 'wedding night', or *upojna noc* 'night of lovemaking'. Moreover, night is associated with the most important Christian holiday—Christmas, e.g., *noc wigilijna* 'Christmas Eve', *święta noc* 'holy night'.

According to dictionaries (Bańko 2000; Dubisz 2003; Żmigrodzki 2007), the adjective *mroczny* 'dark, obscure' has only one metaphoric sense—'full of grief, tragic, suffering, or terror' (Dubisz 2003); 'linked to something evil, dangerous, and mysterious at the same time' (Żmigrodzki 2007). The adjective *mroczny* 'dark, obscure' is preferred in translations of English films or literature, e.g., *Mroczny rycerz* 'The Dark Knight' (a Batman movie), *Mroczne widmo* 'The Phantom Menace' (the first episode of the Star Wars movies), *Mroczna wieża* 'The Dark Tower' (Stephen King's saga), or *Trylogia mrocznego elfa* 'The Dark Elf Trilogy' (Robert Salvatore's novels). The most typical metaphorical collocates with the adjective *mroczny* 'dark, obscure' in HASK are *mroczna atmosfera* 'dark ambiance', *mroczna opowieść* 'dark story', *mroczna muzyka* 'dark music', *mroczny sekret* 'dark secret', *mroczne zło* 'dark evil', or *mroczny demon* 'dark demon'. The adjective can also refer to toxic and dangerous sexual fascinations, e.g., *mroczna namiętność* 'dark passion' or *mroczne pożądanie* 'dark desire'. Typical collections with the adjective are *mroczny i przygnębiający* 'dark and depressing', *mroczny i tajemniczy* 'dark and mysterious', *mroczny i niepokojący* 'dark and disturbing', or *mroczny i straszny* 'dark and horrible'. Therefore, the adjective *mroczny* 'dark, obscure' connotes mystery, eeriness, and awe, but also moral ambiguity—it can refer to mysterious and fascinating heroes like Batman. The adjective *mroczny* 'dark, obscure' does not occur in lexicalized comparisons.

These significant differences between the synonyms *ciemny* 'dark' and *mroczny* 'dark, obscure' cannot be explained from the perspective of CMT. According to Lakoff and Johnson (2008 [1980]), our conceptual structure is based on a central physical experience, like UP-DOWN, IN-OUTSIDE, WARM-COLD, or DARK-LIGHT. Both analyzed lexical items refer to darkness—there is no difference on the conceptual level. Therefore, there should be no difference in their use in metaphors since they primarily arise on the conceptual level and are only expressed in language. Despite this hypothesis, the adjectives differ significantly in their literal and metaphorical usages.

43 The night of May 1st, according to German myths, which is a night of evil spirits and witches.

44 In Slavic tradition, the midsummer night (called also *the night of Kupała* or *Sobótka*) is a feast of water, fire, and love.

Tab. 61: Mapping in the metaphors KNOWING IS SEEING (Sullivan 2006: 393).

SEEING FRAME	KNOWING FRAME
VIEWER	LERNER
OBJECT	IDEA
LIGHT SOURCE	SOURCE OF KNOWLEDGE
LIGHT-EMISSION	INTELLIGENCE

An analysis of two pairs of synonyms, which are keywords in Synamet, shows that there are several semantic factors that have a considerable impact on metaphorization. First of all, the frame analysis shows that there are differences in their literal senses—especially in the pair *ciemny* ‘dark’ and *mroczny* ‘dark, obscure’. The adjective *mroczny* ‘dark, obscure’ can refer only to a lack of light, while the adjective *ciemny* ‘dark’ can also mean weak or dim lighting. According to Sullivan (2006), the metaphor KNOWING IS SEEING can be described as a systematic mapping of the source frame on the target frame (see Tab. 61).

Since the adjective *ciemny* ‘dark’ can refer to LIGHT SOURCE (e.g., *ciemne słońce* ‘dark sun’) and LIGHT-EMISSION (e.g., *ciemne światło* ‘dark light’), it can also mean figuratively that a person is stupid or uneducated. As opposed to *ciemny* ‘dark’, the adjective *mroczny* ‘dark, obscure’ literally means a lack of light; thus, it is never used in such metaphors.

The next semantic factor is a word’s connotations. Few studies have explored this problem. Deignan (2000) investigates a group of near synonyms with different connotations, to see whether these semantic relationships are also apparent in target domain uses. She concentrates on the LUs *thin*, *slim*, *slender*, and *skinny*, and on a group of near synonyms describing excess bodyweight. The study found no evidence for mapping a word’s connotation in literal uses onto metaphorical uses, especially where the word has a complex etymology. Nevertheless, Deignan (2010: 363) writes about her earlier study on connotation as follows:

However, the study did not demonstrate that connotations are never mapped metaphorically; there was evidence from financial reporting texts that words such as bloated and flabby have negative connotations consistent with their literal meanings. It is possible that the study took too simplistic an approach, especially in its focus on single words. (363)

The problem is that Deignan concentrated solely on the connotations of words in their literal senses. In my opinion, one should also consider connotations of lexicalized metaphorical senses of a word. The adjectives that are less often used

in metaphors—i.e., *zimny* 'cold' and *ciemny* 'dark'—have specific, rather determined negative connotations in their metaphorical senses (death, deprivation of emotions in the case of *zimny* 'cold' and stupidity, fishy business, and evil in the case of *ciemny* 'dark'). In contrast, the adjectives *chłodny* 'cool' and *mroczny* 'dark, obscure' have less clearly defined metaphorical meanings; therefore, they have still potential for new, more creative metaphorical usages. Moreover, the connotations of the stereotypical vehicles of a feature (like a fish or corpse for the adjective *zimny* 'cold') should be also considered.

The last two factors, which may have an impact on selecting words for metaphorical expressions, need further research. The first one pertains to a stylistic issue. The adjective *mroczny* 'dark, obscure' is less often used in everyday language. The dictionaries specify that the lexical item is typically used in a literary style. Stylistic factors should possibly also be taken into consideration. The second factor pertains to the phonetic shape of a word and euphonia. Marks (1996: 47) posits that words can evoke physiognomic reactions via their sound, their printed shape, or the shape the vocal apparatus takes in speaking them. The adjective *ciemny* 'dark' contains a front and high vowel [i], while the adjective *mroczny* 'dark, obscure' contains a back and mid vowel [o]. Two formants⁴⁵ F1 and F2, which are most important for distinguishing vowels, differ with respect to the articulation of [i] and [o]. The vowel [i] has the lowest F1 (200) and the highest F2 (2400), while the vowel [o] has a much higher F1 (550) and much lower F2 (900). According to Marks (1982a, 1982b, 1996), people align increasing brightness with increasing pitch. Therefore, subjects in his experiments tend to describe the noun *cough* as dark (as it is lower in pitch) and the noun *sneeze* as brighter (as it is higher in pitch). The Polish adjective *ciemny* 'dark' is higher in pitch than *mroczny* 'dark, obscure'; thus, it might be perceived as brighter. Perhaps for this reason, the phonetic shape of the adjective *mroczny* 'dark, obscure' is more consistent with its literal sense.

45 Formants are the resonant frequencies created by the vocal tract. They are usually referred to as F1, F2, F3, etc. A high F1 is characteristic of a low vowel (i.e., high frequency F1 = low tongue body) and a low F1 is characteristic of a high vowel (i.e., low frequency F1 = high tongue body), see <http://www.bazamazak.uw.edu.pl>.

6 Metaphors in Synamet

In the Synamet corpus, the procedure of annotation and the tool were designed to comply with CMT. It was assumed that every metaphorical expression would reflect a particular conceptual metaphor and could be described as a mapping between two frames—source and target. However, during the analysis of blog entries gathered in Synamet, annotators encountered quite a number of phenomena that did not fit into the source-and-target dual schema. The analyzed texts were characterized by great condensation of phenomena typical of the patterning of metaphor in discourse (Semino 2008: 23–24), that is: clustering, extension, combination, and mixing. This chapter attempts to provide insight into atypical metaphors, and it is structured as follows. The first section presents the variety of verbal metaphors in Synamet and proposes definitions and classifications for them. Then, typical metaphors are analyzed in more detail. The following section takes a closer look at narrative metaphors. In the fourth section, I examine mixed metaphors. The following section brings out different types of metaphorical triggers, and I argue against the claim that metaphors are embodied and that metaphorical expressions reflect conceptual mappings between sources and targets. The final section deals with the different functions of metaphors.

6.1 Classification of metaphors in Synamet

Metaphors in Synamet are classified on grounds of the following attributes:⁴⁶

1. fit in the unidirectional source-to-target metaphorical mappings,
2. grammatical boundaries (one phrase or one sentence boundaries),
3. number of evoked elements of a source frame,
4. number of evoked source frames related to the same target,
5. semantic and syntactic relations between words evoking source and target.

An analysis of the texts showed that only some MUs can be described by the schema put forward by CMT. A MU can be confined to one phrase or one sentence, or it can reach beyond the boundaries of one sentence and encompass a

46 The classification presented in this chapter is more extensive than the categorization of MUs described in the *Annotation methodology* chapter. The latter was adopted for annotation purposes and hence is more general.

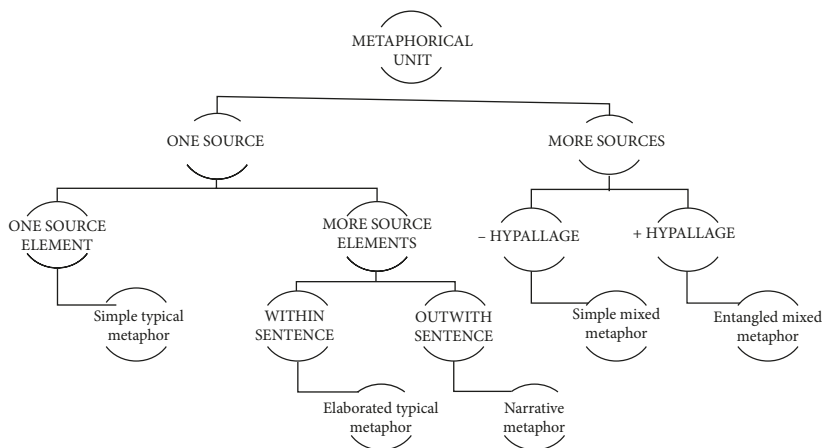


Fig. 30: Typology of metaphorical units in Synamet.

fragment of text, or sometimes even a whole text. Although a metaphor on the general conceptual level can be described as a source-to-target mapping, it may be more elaborated on the linguistic level—several words can evoke the same source but different elements within the same frame. Yet another possibility is that one target is described by more than one source frame. The next feature of a MU, which has to be considered in the classification, is the coherence of semantic and syntactic relations in a MU, since hypallage is quite common in the analyzed metaphors. Keeping those attributes in mind, the following categories of metaphors were distinguished (see Fig. 30): 1. typical simple metaphors, 2. elaborated typical metaphors, 3. narrative metaphors, 4. simple mixed metaphors, 5. entangled mixed metaphors,.

6.2 Typical metaphors

The first and the second groups in the above classification contain typical metaphors in terms of CMT. A *typical metaphor* is defined in the Synamet corpus as a dually structured (*X is Y*) metaphor with a single source frame, confined to one word, one phrase, or one sentence. This type of metaphor fits CMT perfectly. The only difference between the two groups consists in evoking one element (group 1) or more than one source FEs (group 2). The metaphors gathered in the first group I will call *simple typical metaphors*, and the metaphors from the second group I will call *elaborated typical metaphors*.

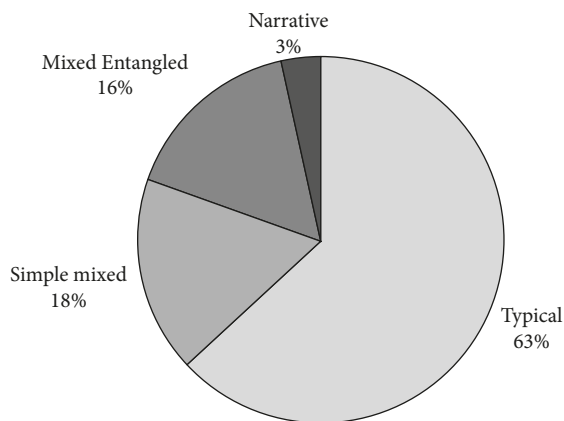


Fig. 31: Percentage of metaphor types in the Synamet corpus.

Interestingly, unidirectional source-to-target metaphorical mappings in Synamet are not as frequent as one might expect; they make up 63 % (see Fig. 31).

6.2.1 Simple typical metaphors

Simple typical metaphors can be expressed in a text as a single word, as different types of phrases, or as a sentence, e.g.,

1. *słodziak* ‘sweet perfume’, a derivative from *słodki* ‘sweet’, **TASTE** → **SMELL**,
2. *smakoprzestrzeń* ‘space of taste’, a compound: *smak* ‘taste’ + *przestrzeń* ‘space’, **SPACE** → **TASTE**
3. *nuta cedrowa* ‘cedar wood note’, **HEARING** → **SMELL**,
4. *ślad jaśminu* ‘trace of jasmine’, **VISION** → **SMELL**,
5. *vetiverowo goździkowa melodia refrenu milknie* ‘vetiver’s and pink’s melody of refrain quiets down’, **HEARING** → **SMELL**
6. *Te perfumy umieją się naprawdę pięknie rozwinąć* ‘The perfumes can come into bloom beautifully’, **PLANT** → **SMELL**.

6.2.2 Elaborated typical metaphors

Elaborated typical metaphors are characterized either by evoking several elements of the same source frame or by evoking the same element of a source frame with several activators, e.g.:

1. *Wino jest delikatne i miękkie* ‘The wine is delicate and soft’, **TOUCH/SUSCEPTIBILITY TO DESTRUCTION** (*delikatny* ‘delicate’)/ **SUSCEPTIBILITY TO PRESSURE** (*miękki* ‘soft’) → **TASTE**,
2. *Ciało osiłka na sterydach: niby duży, niby silny, ale i groteskowy*⁴⁷ ‘The body of an ironman on steroids: he is supposed to be big, strong, but he is also grotesque’, **PERSON/BODY PART** (*ciało* ‘body’)/ **BUILD** (*duży* ‘big’)/ **STRENGTH** (*silny* ‘strong’)/ **BODY EVALUATION** (*groteskowy* ‘grotesque’) → **TASTE**,
3. *Pierwszy akord brzmi przepotężną słodowością*⁴⁸ ‘The first chord sounds with tremendous maltiness’, **HEARING/COMBINATION OF SOUNDS** (*akord* ‘chord’)/ **STATE OF SOUND SOURCE** (*brzmieć* ‘to sound’) → **TASTE**,
4. *Intensywnie doprawiony przedpokój prowadzi do cytrusowego salonu, który jak dla mnie mógłby zajmować trochę mniej miejsca, bo najbardziej wartościowa jest kuchnia – serce domu!*⁴⁹ ‘Intensively flavored entrance hall leads to the citrus salon, which for me could be smaller because the most valuable is the kitchen—the heart of a home!’, **HOUSE/PART OF HOUSE** (*przedpokój* ‘entrance hall’)/ **PART OF HOUSE** (*salon* ‘salon’)/ **PART OF HOUSE** (*kuchnia* ‘kitchen’) → **SMELL**.

6.3 Narrative metaphors

The third category in the classification contains MUs that have one source but reach beyond the sentence boundary. In the Synamet corpus, they are called *narrative metaphors* (see Fludernik 2009a), which are elaborated metaphorical stories. Narrative metaphors can encompass extensive fragments of a discourse or even a whole text. For example, a review of the perfume *Aqua Allegoria Winter Delice* by Guerlain provides a good instance of narrative metaphor (31).

- (31) Czuję w nich przede wszystkim świdrujący dym z dopiero rozpalanych szczap, kiedy piec nie ma jeszcze ustalonego ciągu, i izbę, którą tak koniecznie chcemy ogrzać spowija szary obłok. Zimno tej kompozycji nie pozwala zapomnieć o warunkach panujących tuż za drewnianymi ścianami chaty: jest cicha, spokojna, bardzo mroźna noc, i jakkolwiek mocno drzewa płakałyby żywicą, te lży tężeją natychmiast po wypłynięciu. Z czasem ogień rozpala się stałym płomieniem, zapach „oczyszcza się”, nabiera przejrzystości, nie traci jednak chłodu, jest jak oddalone, posrebrzane szczyty gór w gęstym, zimnym powietrzu. Ciepłe i jadalne komponenty ciągle mającą gdzieś bardzo daleko w tle, a dominuje dym i żywice, co powoduje, że

47 *Baturrica Tarragona Reserva 2007* wine.

48 *Artezan Samiec Alfa* beer.

49 *Scent of Departure* by Abu Dhabi perfume.

zapach wydaje mi się bardzo mocno przynależać do świata przyrody, zdecydowanie mniej do człowieka.

(<http://nostrills.blox.pl/2010/01/Guerlain-Aqua-Allegoria-Winter-Delice.html>)
 ‘First of all, I sense there a drilling smoke from inflamed splints when a flue draft in the stove is not established yet, and a room, which we necessarily want to heat, is smothered with a grey pall. The coldness of this composition does not allow us to forget about the atmospheric conditions behind the wooden walls of the cottage: It’s a silent, calm, freezing night, and no matter how heavily the trees would cry with resin, these tears freeze immediately after surfacing. With time, the fire kindles with a stable flame, the smell “cleans itself,” it gains transparency, but doesn’t lose its coldness, it is like far, silver-plated peaks of mountains in dense, cold air. Warm and edible components still loom somewhere very far in the background, but smoke and resin dominate, which makes us think that the smell seems to belong strongly to the world of nature – certainly less than to the world of man.’

The author of the text in (31) compares the perfume’s aroma to the smell of smoke coming from wood burning in a stove. This comparison is a starting point for an elaborate story about a freezing night and a cottage in the woods near mountains. Only one element of the whole story corresponds strictly to the aroma of the perfume—resin, which is used as an essential oil. The rest is a set of subjective and loose associations engaging various visual and tactile perceptions.

Narrative is an important structuring element of human understanding. According to Bruner (2009), narrative offers a way of “ordering experience, of constructing reality” (11). Schank and Abelson (1995) propose that our knowledge is structured in a story format. Likewise, Snævarr (2010) argues that

The ability to construct small spatial stories is universal. We are naturally wired to organise the world as stories. To slice the world into discrete objects means putting the slices in small spatial stories because our identification of objects is dependent upon the typical stories in which they appear. (242)

Filar (2013: 86–88) hypothesizes that language can be interpreted as a Big Narrative, which arranges, co-creates the world, and organizes its linguistic image. She distinguishes *small narratives* and *micronarratives*, which are individual text narratives that depend on the Big Narrative. Small narratives can repeat linguistic conventional structures, expand them creatively, or even challenge them. Micronarratives, which can be evoked by lexical items or grammatical structures, are the smallest narrative parts of a language.

The relation between metaphor and narrative is an under-researched topic (see Fludernik 2009a; Ritchie 2017b; Eubanks 2000). Fludernik (2009a) notes that “cognitive metaphor theory has not resulted in a greater understanding of metaphor in narratives” (110). Nevertheless, there are scholars who note strong

connections between metaphors and narratives (Deignan 2017; Hellsten 2002; Nünning 2009; Martens & Biebuyck 2013). Hellsten (2002) argues that there is one more level in metaphors, which are broad narratives about the world. Therefore, Hellsten (2002) distinguishes three levels of metaphors; “the narrative, the conceptual, and the linguistics” (47).

6.3.1 Definition of a narrative metaphor

A narrative metaphor can be viewed as a type of a more general class called *extended metaphor* (Browse 2016; Charteris-Black 2016; Ritchie 2017a; Semino 2008; Tirrell 1989). Semino (2008) proposes the use of the term *extended metaphor* “when at least two metaphorically used words belonging to different phrases describe the same target domain/scenario in terms of the same source domain/scenario” (25). According to Charteris-Black (2016), “an extended metaphor is where a series of semantically related metaphor vehicles describe the same metaphor topic” (162). Gibbs (2017) defines this type of metaphor as “one conceptual metaphor that motivates several related linguistics expressions in the same stretch of discourse” (47). Oswald and Rhis (2014) note that “extended metaphors are realised in discourse through the recurring exploitation of the same metaphor at several conceptual levels over a relatively long span of text” (139). Likewise, Werth (1994, 1999) defines an extended metaphor as a construction beyond the sentence level—it exists on a discourse level and is governed by a main megametaphor that manifests itself through a series of micro-metaphors. Crisp (2005: 124) argues that extended metaphor contains language that relates directly to both the source and target and hence differs from allegory.

Other scholars note that extended metaphors contain element of narrative (Nünning 2009; Deignan 2017). Snævarr (2010: 233) uses the term *storied metaphors*, and emphasizes that such metaphors are constituted by explicit or implicit narratives. According to his definition, metaphor has a storied structure if “a) essentially unfolds in time and has a given beginning, middle, and end; b) this unfolding forms a unified whole” (Snævarr 2010: 174). Extended metaphor is also described as scenes or scenarios (Koller 2004; Musolff 2004, 2006; Nerlich 2011; Semino 2008). Although extended metaphors are not a subject of research in CMT, Lakoff and Narayan (2010) note that “Conventional stories with conventional motifs are often mapped by conceptual metaphors onto everyday situations, e.g., in politics, science, the arts, a personal biography” (27). Musolff (2006), rather than using the term *source domain*, introduces the term *source scenario*:

Scenarios enable the speakers to not only apply source to target concepts but to draw on them to build narrative frames for the conceptualization and assessment of sociopolitical issues and to “spin out” these narratives into emergent discourse traditions that are characteristic of their respective community. The analysis of source scenarios as focal areas of source domains provides a platform to link the conceptual side of metaphor to its usage patterns in socially situated discourse. (35–36)

Likewise, Semino (2008) argues that “the source scenario provides a narrative line that is exploited to structure the target in terms of a sequence of actions with a beginning, a middle and an end” (220).

The most extended research on metaphorical stories has been done by Ritchie (2010, 2011, 2017a, 2017b). Ritchie (2017a) calls this phenomenon a *metaphorical story* and defines it as “subcategory of communication in which a vehicle story is at least narrated, such that it expresses something about, and can be mapped onto, a topic story from a totally different domain” (242). In his definition, metaphorical stories do not necessarily have extended metaphors. He argues that “metaphorical stories are often only implied, or only the bare bones are related, as in the ‘born on third base’ example” (Ritchie 2017b: 132).

In this book, a *narrative* is understood as a creation of a *possible world*, in terms of Fludernik’s (2009b) definition:

A narrative (Fr. récit; Ger. Erzählung) is a representation of a possible world in a linguistic and/or visual medium, at whose centre there are one or several protagonists of an anthropomorphic nature who are existentially anchored in a temporal and spatial sense and who (mostly) perform goal-directed actions (action and plot structure). It is the experience of these protagonists that narratives focus on, allowing readers to immerse themselves in a different world and in the life of the protagonists. In verbal narratives of a traditional cast, the narrator functions as the mediator in the verbal medium of the representation. Not all narratives have a foregrounded narrator figure, however. The narrator or narrative discourse shape the narrated world creatively and individualistically at the level of the text, and this happens particularly through the (re)arrangement of the temporal order in which events are presented and through the choice of perspective (point of view, focalization). Texts that are read as narratives (or ‘experienced’ in the case of drama or film) thereby instantiate their narrativity (Fr. narrativité; Ger. Narrativität). (6)

Therefore, a *narrative metaphor* is defined in this book as follows: the metaphor is narrative when 1) it describes the same referent, 2) it is a construction beyond the sentence level, 3) it is a representation of a possible world (different than the world created in the rest of the text), and 4) the possible world is introduced by an apparent shift in reference.

In (32) the target—the aroma of a beer—is introduced right at the beginning by the activator *zapach* ‘smell’. Then, there is a shift to the source, which is a terrain, evoked by words *góra* ‘mountain’, *las* ‘wood’, and *rzeka* ‘river’.

- (32) Zapach:⁵⁰ Gdzieś tam, za górami i lasami owocowych i kwiatowych estrów, przebijają się nieśmiało oznaki jankesowości. Płynie rzeka autolizy, szumi paloność i karmel. Wesoło prószą diacetyl. Średni to krajobraz.
(<https://www.piwo.org/forums/topic/14678-piwny-garaż-ipa-day-2014/>)
‘Aroma: Somewhere, over hills and woods of fruity and flowery esters appear shy signs of Yankee. River of autolysis flows, smoke and caramel rustle. Diacetyl merrily snows. The landscape is average.’

Sometimes narrative metaphors start with a simple source-to-target metaphor (e.g., (33) AROMA IS FABRIC), or a simile (e.g., (34)—perfume smells like a woman—or (35)—perfume is like a shawl). Afterwards, the narrator apparently switches referents and moves on to a thorough and detailed description of a source as if it were the real thing—in (33) and (34), the narrators describe rooms and in (35), the apparent referent is a red shawl. The narration is sometimes so elaborate that at some points the reader may lose sight of the actual topic.

- (33) Satyna niejedno ma imię, a ta którą otula nas Kurkdjian⁵¹ to satyna gruba, ciężka i mięsista — jak wieczorowa suknia sprzed lat, jak zasłony w starodawnym salonie w orientalnym stylu, jak pluszowe obicie fantazyjnie złożonej na brzegach kanapy, jak baldachim w kolorze głębokiej, rubinowej czerwieni. Nie dajcie się jednak zwieść tym kilku encyklopedycznym niemal przykładom przepychu i zbytku. Rozejrzyjcie się dokładniej, a zauważycie, że to tylko parę klejnotów oprawionych w minimalistyczną, grafitową ramę całego wnętrza. Widać, że zaplanowano je z kunsztem, unikając przesady. [...] Pośród prostych, ciemnych ścian na wysokim łożu z baldachimem hojną ręką rozsypał ktoś tysiące płatków róż, przetykając je gdzieniegdzie drobnymi fiołkami. A oud? Oud leży na tym miękkim posłaniu z wonnych fiołków i róż, wsiąka w nie niczym Mena Suvari na słynnym plakacie do filmu *American Beauty*.
(<http://pachnacehistorie.pl/2015/08/12/maison-francis-kurkdjian-oud-satin-mood/>)
‘Satin has many names and this one, with which we are wrapped by Kurkdjian, is a satin thick, heavy, and fleshy like an evening dress from the olden days, like curtains in an ancient salon in an oriental style, like the plush covering of a sofa,

50 Review of the *Great Heck Brewing Black Jesus Black IPA* beer— An American black ale-style beer.

51 Review of the perfume *Oud Satin Mood* by Francis Kurkdjian.

with fancy gold-plated edges, like a canopy in the color of a deep, ruby redness. Don't be fooled by these encyclopedic examples of splendor and lap of luxury. Look around and you will see that these are just a couple of jewels mounted in a minimalistic, graphite collet of the whole room. Apparently, it is exquisitely arranged, avoiding extravagancy. Within simple, dark walls, someone sprinkled on a large canopied bed thousands of rose petals, interspersed here and there with dainty violets. And what about an oud? The oud is lying on this soft bedding made of aromatic violets and roses, soaking in them like Mena Suvari in the famous poster of the American Beauty film.'

- (34) Nazwałabym Artemisie⁵² zapachem buduarowym, pachnie bowiem jak kobieta ukąpana ekskluzywnym mydłem, w lnianej krochmalonej, schnącej na powietrzu pościeli. Na dębowej toalecie owej kobiety pyszni się wielki bieluteńki puszek, utyłany co nieco pudrem Yardley a obok stoi wielki wieheć bogatego w kwiecie jaśminu, zapachy przenikają się, bukiet jaśminu znika a na jego miejscu staje niepozorny bukietek fiołków, albo nie – stoją obydwaj, albo nie – cały pokój zastawiony jest wazonami. W pięciu jest jaśmin, w kolejnych pięciu fiołki a w trzech ostatnich-konwalie. Nie ma już miejsca, zostało tylko 10x10 cm wolnej powierzchni na komodzie i tam stoi filiżanka herbaty, oczywiście jaśminowej.

(<http://skarbka-nosem.blogspot.com/2011/09/penhaligons-artemisia.html>)

'I would call Artemisia a boudoir perfume because it smells like a woman washed with a posh soap, in air-dried bed linen. A big, white puff, with Yardley powder stains on it, lies on the woman's oaken dressing table, and alongside stands a huge bunch of flourishing jasmine, aromas interpenetratable, the bouquet of jasmine fades away and in its place appears an inconspicuous bouquet of violets, or no—they stand together, or no—the whole room is stacked with vases. In five of them are jasmines, in another five—violets, and in the last three—lilies of the valley. There is no more place left, just 10x10 centimeters of free space remains on a chest of drawers where stands a cup of tea—jasmine obviously.'

- (35) [...] zapach⁵³ otulający ciało jak miękkiej szal: niemal namacalnie, ale jednak przyskórnienie. Ten szal jest oczywiście czerwony – czerwony ciemną, głęboką, nieco zgaszoną, szlachetną czerwienią.

(<http://www.sabbathofsenses.com/2008/07/comme-des-garcons-series-2-red.html>)

'the perfume wraps a body like a soft shawl: nearly tangible and yet next to the skin. The shawl is of course red—with a dark, deep, a bit subdued, noble redness.'

52 Review of the perfume *Artemisia* by Penhaligon's.

53 Review of the cologne *Comme des Garçons Series 2 Red: Palisander*.

Tab. 62: Mapping the source frame onto the target frame in the narrative metaphor of example (36).

THE SOURCE FRAME (MEADOW)	THE TARGET FRAME (PERFUME)
plant	perfume <i>Emerald</i>
leaves rich in chlorophyll	first percept
golden glow	neroli essential oil
appears bergamot	bergamot essential oil
white flowers blossom	essential oils of jasmine, magnolia, lily of the valley

6.3.2 Different types of narrative metaphors

There are different types of narrative metaphors with regard to mapping between source and target frames. In example (36) below, one root metaphor PERFUME IS A MEADOW is extended by chains of sub-metaphors, where the essential oils of the perfume *Emerald* are conceptualized as various plants growing in a meadow.

- (36) Emerald⁵⁴ wyrasta na żywej łące. Początkowa soczystość podkreśla liściaste, nasycone chlorofilem nuty. Gdzieś w tle majaczy złocista poświata neroli, ale cały czas to dodatek, a nie temat główny. W atmosferze zieleni jest mnóstwo świeżości i trawiastych elementów. Nie ma za to przesady. Po kilku minutach pojawia się cierpka bergamotka, ale znowu ze sporym ładunkiem organicznej zieleni. Zakwitają w końcu białe kwiaty. Jaśmin, magnolia, konwalia...

(<https://www.nezdeluxe.pl/2011/11/cuarzo-signature-emerald-zielen.html>)

'Emerald grows in a living meadow. An initial juiciness emphasizes its leafy notes, rich in chlorophyll. Somewhere in the background looms a golden glow of neroli, but still it is an addition – not the main topic. There are a lot of freshness and grassy elements in the atmosphere of verdure. Yet, there is no exaggeration. After a few minutes a tart bergamot appears, but again with a considerable load of organic verdure. Eventually, white flowers blossom. Jasmine, magnolia, lily of the valley...'

In example (36) above, the mapping from the source frame structure onto the target domain is observed throughout the whole text or a text fragment (see Tab. 62).

Examples (37) and (38) are even further removed from the main topics of metaphorical expressions. The authors associate the perfume's aroma with sunny spots on the fur of a big yellow cat in (37) or a daily morning routine in (38).

54 *Emerald Cuarzo Signature* perfume.

There is no obvious relation between the structure of the source and target frames. The stories resemble impressionistic pictures, a free interpretation of a personal olfactory experience.

- (37) Jej subtelna, dyskretna zmienność przypomina leniwie zmienny układ słonecznych plamek na futerku wielkiego, żółtego kota wylegującego się na miękkim kocyku pod kwitnącą jabłonią. Kot donikąd się nie wybiera. A Lamsa⁵⁵ spieszy się dokładnie tak samo. Niedostrzegalnie. W sumie wcale... Gdzieś poza naszą percepcją przewędrowuje od owocowo-kremowego otwarcia po kremowo-owocową bazę. Bezszelstnie jak słońce. Albo jak kot. Choć ten kot, jak już wspomniałam, donikąd się nie wybiera. Ma czas. Poczekaj, aż słońce sobie pójdzie. Ono musi. On nie. (<http://www.sabbathofsenses.com/2013/06/jak-kot-czeka-az-sonce-sobie-pojdzie.html>)

'Its subtle, discreet variability resembles the lazily changing layout of sunny spots on the coat of a big, yellow cat lounging on a soft blanket under a blooming apple tree. The cat is going nowhere. And Lamsa rushes identically. Imperceptibly. Altogether – not at all. Somewhere beyond our perception it wanders from the fruity-and-creamy opening to creamy-and-fruity base. Silently like the sun. Or like a cat. Even though, as I have mentioned, this cat is going nowhere. He's got time. He waits until the sun goes away. It must eventually go. He doesn't have to.'

- (38) Wyobraź sobie chłodny, może nawet lekko deszczowy poranek. Powietrze jest krystaliczne, słońce dopiero wstaje. Otwierasz oczy, przeciągasz się powoli i wychodzisz z ciepłej, bawełnianej pościeli. Budzisz się, biorąc letni prysznic. To chwila tylko dla Ciebie, zanim wejdziesz w rytm zwykłego dnia. Nie szykujesz się jeszcze do wyjścia. Mokre włosy zaczesujesz do tyłu, by wyschły naturalnie. Narzucasz na siebie sweter i idziesz napić się kawy... Narciso⁵⁶ to ten miękki biały sweter założony na świeżo umytą, pachnącą jeszcze kremowym mydłem skórę. Ogrzewa ją, otrzymując jej ciepło w zamian. To błogi poranek. (<http://pachnacehistorie.pl/2015/04/13/narciso-rodriguez-narciso/>)

'Imagine a cold, maybe even a little rainy morning. The air is crystal, the sun is just rising. You open your eyes, stretch out slowly, and slip out from the warm, cotton bedding. You wake up, taking a lukewarm shower. It is a moment only for you before you get into a rhythm of an ordinary day. You have not prepared to leave yet. You slick your wet hair back to let it dry naturally. You slip into a jumper and go to have a cup of coffee... Narciso is that soft, white jumper put on freshly washed skin, still smelling of creamy soap. The jumper warms it up and receives its warmth in exchange. It is a blessed morning.'

55 The perfume for woman *Lamsa* by Arabian Oud.

56 The perfume *Narciso* by Rodriguez Narciso.

While the perfume *Lamsa* is described as a yellow cat, there is no indication in the text of what the sources “soft blanket” or “blooming apple tree” correspond to in the SMELL target frame. Likewise, in example (38) we cannot establish a mapping between source and target—we do not know which essential oils correspond to drinking coffee or taking a shower. Therefore, narrative metaphors are sometimes close to allegories (Crisp *et al.* 2002; Crips 2005, 2008; Gibbs 2011, 2015; Ritchie 2017b; Snævarr 2010, Sullivan 2013). According to Crisp (2008):

[a]llegory can be regarded as a super-extended metaphor, extended to the point where its language relates only to the metaphorical source. [...] While extended metaphor involves both source-related and target-related language, allegory involves only source-related language. [...] Extended metaphors create a conscious, and rather strange, experience of metaphorical blended spaces, while allegories refer to and characterize fictional situations functioning as their metaphorical sources. (291–293)

The usage of narrative metaphors may be driven by many factors. When a single extended metaphor provides a conceptual structure for an analyzed piece of discourse, it contributes to the fact that the author is able to “make a point emphatically and vividly” (Kövecses 2016: 8). If this is the case, it follows that the function of extended metaphors is both expressive (it allows the speaker to express their views, emotions, and subjective associations, which are often difficult to communicate) and impressive (it enables the reader to get in touch with the speaker’s internal world of thoughts and emotions and to share a subjective experience, at least to some extent). It is worth noting that extended metaphors occur in the Synamet corpus primarily in texts that concern olfactory or gustatory experiences (perfume, beer, or wine reviews). The volatile, subjective experience calls for a method of description that could convey not only objective properties of the object of perception, but also various emotions and associations connected with it.

6.4 Mixed metaphors

The fourth and the fifth groups in the classification of metaphors consist of MUs that exhibit several sources referring to one target. Such metaphors are called *mixed metaphors*. Traditional views on stylistics and poetics see this phenomenon as an example of bad writing, yielding incongruent images (Gibbs 2016: vii). Nevertheless, within the contemporary framework of cognitive linguistics, various explanations of mixed metaphors’ acceptability have been offered (Gibbs’s 2016 edited volume; Kimmel 2010; Sullivan 2019; White 1996). Crisp *et al.* (2002) propose the following definition: “mixed metaphor arises when multiple or complex metaphor contains metaphorical items which may

be derived from more than one source domain” (63). Kimmel (2010: 110) notes that metaphors should be defined as mixed when they involve different metaphorical expressions occurring within the same clause. Likewise, Forceville (2016: 225) argues that mixed metaphors result from squeezing several conceptual metaphors into a single grammatical expression. In contrast, Semino (2016) emphasizes semantic features of mixed metaphors instead of grammatical boundaries, and writes that “neither clause boundaries nor sentence boundaries can, in principle, block the perception of clashes between metaphors that are described as ‘mixed’” (216).

Mixed metaphors are quite problematic from the perspective of CMT. Kövecses (2016) notes that on the CMT view, a receiver has to resolve incompatibilities in imagery when two (or more) source domains collapse. However, it seems that people have no difficulty in the comprehension of mixed metaphors (see Lonergan and Gibbs 2016: 67; Müller 2016: 39–40; Semino 2016: 207); hence, they might comprehend the target directly (on a non-CMT view). Kövecses (2016) observes that “it is the non-CMT view that appears to be the more adequate way to account for the processing of mixed metaphors” (11). Likewise, Lonergan and Gibbs (2016: 69) note that CMT cannot explain both the production and understanding of mixed metaphors.

In this book, a *mixed metaphor* is defined as a metaphorical phrase or clause where more than one source frame is activated. Moreover, two types of mixed metaphors are proposed: *simple mixed metaphors* (group 4) and *entangled mixed metaphors* (group 5).

6.4.1 Simple mixed metaphors

In simple mixed metaphors, semantic relations are coherent with syntactic relations, i.e., a target frame is superordinate also on the sentence level, e.g., (39):

- (39) Chanel Coco Mademoiselle to zapach niby łatwy, lekki i przyjemny — cytrusy, kwiaty i trochę paczuli, prosty przepis na wiosenny bestseller.
 ‘Chanel Coco Mademoiselle is a seemingly simple, light, and agreeable fragrance—citrus, flowers, and some patchouli, a simple recipe for a spring bestseller.’

In the phrase *zapach niby łatwy, lekki i przyjemny* ‘a seemingly simple, light, and nice fragrance’, two source frames are evoked: the source frame, **ABSTRACT CONCEPTS**, is evoked by the adjective *łatwy* ‘simple’, and the source frame **MULTIMODAL PERCEPTION** is evoked by the adjective *lekki* ‘light’. In the phrase *prosty przepis na wiosenny bestseller* ‘a simple recipe for a spring bestseller’, two more source frames are activated: the **COOKING** source frame by

the noun *przepis* ‘recipe, and the **CULTURE&ART** source frame by the noun *bestseller* ‘bestseller’.

In example (40), the target (*Chablis 1er Cru Côte de Cuissy 2009* wine) is described by four source frames: **VISION** (evoked by *krągły* ‘round’ and *cień* ‘shadow’), **TOUCH** (evoked by *satynowy* ‘satiny’ and *ostrość* ‘sharpness’), **WILD ANIMAL** (evoked by *pazur* ‘claw’), and **TIME** (evoked by *końcówka* ‘end’). The source frames activators are intertwined within the MU.

- (40) Prawdziwą uczta dla zmysłów okazuje się jednak Chablis 1er Cru Côte de Cuissy 2009 [...], bardzo aromatyczne (kwiaty, suszone owoce), krągłe, satynowe, z cieniem mineralności i z pazurem, którego ostrość ujawnia znienacka dopiero w końcówce. (<http://blogi.magazynwino.pl/rybak/page/5/>)
 ‘Chablis 1er Cru Côte de Cuissy 2009 turns out to be a true feast for the senses [...] it is very aromatic (flowers, dried fruits), round, satiny, with a shadow of minerality, and with a claw, whose sharpness is suddenly revealed only in the end.’

6.4.2 Entangled mixed metaphors

Entangled mixed metaphors are much more complex than simple mixed metaphors. In entangled metaphors, one encounters not only several source frames, but also highly condensed layers of metaphors, metonymies, and hypallages. A hypallage is a reversal of the syntactic relationship of words in an utterance. In this figure of speech, syntactic and grammatical dependences are divergent with logical connections, i.e., an epithet (e.g., an adjective) is transferred from a noun, to which it belongs, to a noun with which it fits only grammatically, but not logically (Głowiński *et al.* 1988). Entangled metaphors can be viewed as structures that compress several multi-leveled metaphors into one, much smaller, surface form. This compression creates a complex image that cannot be easily explicated by uncompressed constituent metaphors without losing some important senses. For example, the sentence *Stopniowo wycisza się cytrusowa słodycz* ‘The citrus sweetness quiets down little by little’ refers to the smell of citrus essential oil in a perfume. The nominal phrase *cytrusowa słodycz* ‘the citrus sweetness’ is a transfer from the **TASTE** source frame (evoked by the noun *słodycz* ‘sweetness’) to the **SMELL** frame (evoked by the adjective *cytrusowy* ‘citrus’)—in this case, on the syntactic level, the target is subordinate. The verb *wyciszać się* ‘to quiet down’ evoking the **HEARING** source frame in the analyzed sentence refers to the subject, which is the noun *słodycz* ‘sweetness’. It seems as if the verb describes a gustatory sensation, but in fact the referent of the whole sentence is the perfume *Aqua Allegoria Mandarine Basilic* by Guerlain. Therefore, the mapping is from the **HEARING** source frame to the **SMELL** target frame.

The aroma of the perfume is described by two sources—**TASTE** (*słodycz* ‘sweetness’) and **HEARING** (*wyciszać się* ‘to quiet down’). It is an example of a mixed metaphor combined with hypallage. In *Tak samo źle wypada baza, która jest pylista z cieniem zakurzonych nut kwiatowych* ‘The base is equally bad: powdery with a shadow of dusty flowery notes’, we observe two highly compressed, entangled mixed metaphors: *baza, która jest pylista* ‘the base which is powdery’ and *z cieniem zakurzonych nut* ‘with a shadow of dusty flowery notes’. At the syntactic level, it looks as if the noun *baza* ‘base’ has a feature of being powdery, but the word *baza* ‘base’ is already a metaphor—the noun denotes the scent of a perfume, which appears as the last one. In fact, the adjective *powdery* describes the smell of the perfume. Therefore, the syntax and semantics of the metaphorical expression are mismatched. The second fragment of the above example seems to be a description of musical notes; yet again, the real topic of the metaphor is smell, signaled only by the adjective *flowery*. The noun *nuta* ‘note’ is also a metaphorical term for an ingredient of perfume—essential oil. In the analyzed example, we have three layers of metaphors (the metaphorical terms *baza* ‘base’ and *nuta* ‘note’, and the entire metaphorical expression), and two hypallages—the adjectives *powdery* and *dusty* describe the most intense scent of the perfume.

The concept of an entangled metaphor seems to be similar to a cascade:

A cascade is a hierarchically organized conceptual combination of image-schemas, frames, and metaphors that has been used often enough to become fixed as a single complex entity, though each of its parts continues to occur separately. The notion of cascade builds on the observation made in frame semantics that frames are bundles of coherent roles dynamically related to one another [...] It also builds on the observation in conceptual metaphor theory that metaphors are essentially bundles of mappings across frames that occur within domain. (David *et al.* 2018: 86)

The texts in the Synamet corpus are characterized by an abundance of mixed and entangled metaphors. In fact, if the Semino (2016) approach were to be adopted in the definition of mixed metaphors (with no grammatical but rather semantic boundaries), the typical metaphors would be in the minority, since a typical example of the annotated texts in Synamet looks like (41):

- (41) Smak:⁵⁷ Wybitnie pełne, słodkie i mocno słodowe. Niskie wysycenie. Pierwszy akord brzmi przepiękną słodowością i jest elegancko aksamitny. W drugim zaczynają grać ciemne nuty – gorzka czekolada, likier kawowy i wanilia. Finisz pełny, palony, lekko pikantny. Aksamitny jak i cały profil.
(<https://www.piwo.org/forums/topic/13871-piwny-garaż-samiec-alfa/>)

57 *Artezan Samiec Alfa* beer review.

‘Taste: Remarkably full, sweet, and heavily malt. Low saturation. The first chord sounds like a very mighty maltiness and is elegantly velvety. In the second—start to play dark notes—dark chocolate, coffee liqueur, and vanilla. The finish is full, burned, lightly spicy. Velvety like the whole profile.’

In this excerpt referring to one target (a beer taste), seven different source frames are evoked at the same time: the **OBJECT** source frame (*pełny* ‘full’), the **VISION** source frame (*niski* ‘low’, *ciemny* ‘dark’, *profil* ‘profile’), the **HEARING** source frame (*akord* ‘chord’, *brzmieć* ‘to sound’, *nuta* ‘note’), the **PERSON** source frame (*przepotężny* ‘very mighty’), the **CLOTHES** source frame (*elegancko* ‘elegantly’, *aksamitny* ‘velvety’), the **SPORT** source frame (*finisz* ‘finish’), and the **MULTIMODAL PERCEPTION** source frame (*lekko* ‘lightly’).

The tendency to use mixed and entangled metaphors in annotated texts is conspicuous and striking. One might wonder why people so willingly use such metaphors. Fauconnier and Turner (2008) emphasize that:

Conceptual products are never the result of a single mapping. What we have come to call “conceptual metaphors,” like TIME IS MONEY or TIME IS SPACE, turn out to be mental constructions involving many spaces and many mappings in elaborate integration networks constructed by means of overarching general principles. These integration networks are far richer than the bundles of pairwise bindings considered in recent theories of metaphor. (53)

According to Kimmel (2010: 110), mixed metaphors allow a speaker to cover various aspects of a target domain. Likewise, Kövecses (2016) notes that:

[...] the target domains, or frames, we are developing in the course of producing and understanding (metaphorical) discourse have many aspects to them, and these aspects normally require different source domains, or frames, for their conceptualization. (6)

Charteris-Black (2016) writes, “While ‘mixed’ at the surface linguistic level—they may be conceptually and rhetorically consistent” (163). Müller (2016) thinks that “mixing of metaphors results from dynamic activation of uncommon aspects of metaphoric meaning” (49), and claims that a dynamic view on metaphor is needed to account for this phenomenon. Mixing and entangling metaphorical expressions seems to be, on the one hand, a convenient way to simultaneously express several different aspects of the target frame and, on the other hand, to condense the verbal metaphor, thus making it highly economical.

6.5 Metaphorical triggers

In this section, I argue that metaphors can be triggered by different factors, calling into question two main assumptions of CMT—the embodiment of and

conceptual mapping between source and target. The embodiment approach defines metaphorical mapping as occurring between a physical, concrete source domain and a more abstract target domain. The idea that physical experiences are a basis for abstract reasoning is not new or original. Most etymologists believe that concrete, physical senses anteceded the abstract meaning of words. Nevertheless, the hypothesis is unduly simplified and in some cases not true. For example, Todorov (2011: 248) notes that the idea of concrete nouns' primacy in language is misleading. Todorov quotes an analysis by Benveniste, who shows quite the opposite—that an abstract meaning can be the primary one and a concrete sense can be derived. Benveniste criticized Osthoff's etymology of the words *trust*, *true*, and *truce*, which are cognates of the noun *tree*. Osthoff proposed that the semantic and morphological evolution of those words began with a Proto-Indo-European root, continued, e.g., in Greek *drûs* 'oak'. Osthoff claimed that the Gothic adjective *triggws* and the Old High German *Gitriuwi* 'faithful' in their literal sense meant 'hard as an oak', and he hypothesized that an oak was a symbol of reliability and trust for Germans. In contrast, Benveniste demonstrates that the root *drû* meant 'oak' only in Greek and that meaning is much later, while in other Indo-European languages, the main sense of the root *drû* was 'wood, tree' (see Polish *drewno* 'wood', *drzewo* 'tree'). Moreover, oaks do not grow on all of the territories where Indo-European languages are spoken. Therefore, in Proto-Indo-European the root's *drû* basic and primal sense was 'to be hard, solid, healthy' and the more physical and concrete meanings 'tree', 'wood', or 'oak' were secondary. The analysis of texts in Synamet shows that physical and concrete perceptual experiences can be targets onto which more abstract concepts can be mapped (e.g., *latwe wino* 'an easy wine' **ABSTRACT CONCEPTS** → **TASTE**); therefore, some weak synesthetic metaphors do not support the embodiment hypothesis. Likewise, not all mappings that occur in MUs gathered in the Synamet corpus can be explained by analogies in source and target frame structure. Gibbs and Cameron (2008: 2008) note that:

There is little consideration of the possibility that even if such mental structures exist that they may only be partially recruited during metaphor performance. For instance, metaphor performance may be influenced by understandings of conventional metaphorical mappings without all aspects of that knowledge (i.e., the rich set of entailments arising from source-to-target domain mappings) being accessed during speaking and listening. (67)

Gibbs and Lonergan (2009: 251) emphasize the necessity of looking at metaphor as a product of discourse and, at the same time, as a creator of a discourse, situated in a given socio-cultural context. Gibbs and Lonergan (2016)

argue that “people’s understanding of verbal metaphors in narratives is aided by their rich social and cultural knowledge of the source domains referred to explicitly in language” (69). Semino (2008: 218) observes that in some metaphors, the choice of source may be influenced by the topic of the text or by the situational context. Semino (2008) distinguishes two types of metaphorical triggers: *topic-triggered metaphors* which “involve the use of some aspect of the topic under discussion as a source domain or scenario” (222), and *situationally triggered metaphors* in which “the chosen of source domain or scenario is linked to some aspects of the relevant communicative situation” (224). Likewise, Kövecses (2016) observes that “in the case of ‘context-induced’ metaphors [...] the various contextual factors may unconsciously and intuitively prime the use of source domains” (14). Kövecses (2016) argues that the choice of metaphors in a particular discourse is “often influenced by the local and global context. The local context might be for example cultural, social, physical, or linguistic factors” (9–10). The analysis of MUs in Synamet allows us to distinguish the following metaphorical triggers: already lexicalized metaphorical terms, names of subjects of reviews (perfumes, wines, beers, etc.), and situational and cultural factors.

6.5.1 Lexicalized metaphorical terms

In wine, music, or perfumery discourses, specialized terms are used, which have metaphorical provenience, e.g., *ciało wina* ‘body of wine’, *ogon* ‘lit. tale, sillage’, or *material* ‘material—music on an album’. These lexicalized terms can trigger new, more creative metaphors. This phenomenon seems similar to *layered metaphor* (Cameron 2016; Ritchie 2010), which is a metaphor where the vehicle itself is already metaphorical (e.g., *sweet talk* or *my healing journey*). In this book, a modified definition is offered—a layered metaphor is when one metaphorical expression consists of more than one conceptual metaphor and/or, in order to understand it, a reader needs to evoke a broad context that is also metaphorical. For example, (42) uses *otulacz* ‘something, which wraps’, a derivative of the verb *otulać* ‘to wrap’:

- (42) Kontynuując opowieść o jesiennych otulaczach, napiszę Wam o jednym z nich—różanym.⁵⁸

‘To continue a story about autumnal wrappers, I will write about one of them—the rose one.’

58 The perfume *Calligraphy Rose* by Aramis.

The derivative is motivated by the lexicalized metaphorical expression *nosić perfumy* ‘to wear perfume’ as if perfume were clothes. Example (43) is built on the same basis, in which the author describes perfume as a garment.

- (43) Widzę jednak wyraźnie, że moja zapachowa garderoba jest dość niezależna od pory roku.
‘I can see clearly that my aromatic garment is quite dependent on the time of year.’

And yet another perfumery term, with metaphorical provenance, triggers a more elaborate metaphor in (44).

- (44) [...] dalej robi się już tylko bardziej francusko, dzięki mydlano-słodkiemu ylang-ylang by w końcu u kresu trwania na mankiecie (który nadchodzi nieco zbyt szybko jak dla mnie) stać się zmysłowym i powiedziałabym nawet lekko buduarowym absolutnie kobiecym puchatką z ambrowym ogonkiem.⁵⁹
(<http://skarbkanosem.blogspot.com/2012/11/>)
‘[...] further, it is becoming more French thanks to the soapy and sweet ylang-ylang and in the end of the lasting of the aroma on my cuff (of which the end comes too quickly for me), it becomes sensual and, I would say, even a little boudoir, an absolutely feminine fluffy critter with an ambergris tale.’

The perfumery term *ogon* literally means ‘tale’, but in English perfumery discourse its equivalent is *sillage*, which refers to the intensity and duration of a perfume’s aroma in the air. In (44), the author uses *puchatek* ‘fluffy critter’, derived from the adjective *puchaty* ‘fluffy’. The term *ogon* ‘tale’ triggers a more creative association of a small, fluffy animal with a little tale (*ogonek* is the diminutive of the base *ogon* ‘tale’) made of the aroma of ambergris.

The wine term *ciało wina* ‘body of wine’ mainly describes a wine texture—its density, alcohol, extract, and glycerin content. Another metaphorical term—*character wina* ‘character of wine’ means that the wine has all of the essential features of a particular variety. These lexicalized terms trigger more complex layered metaphors, as in (45).

- (45) I choć lubiłam myśleć o nero⁶⁰ jak o szorstkim, nieokrzesanym Sycylijczyku (z wszystkimi tego wadami), to ogolony i wygładzony nero od Gigliotto przypadł mi do gustu. [...] To wino-osiełek, dobrze zbudowane, mięsiste, gęste o lukrecjowo-goździkowym nosie; Chciałoby się rzec, że to wino z silną osobowością.
(<http://blogi.magazynwino.pl/rybak/nero-ogolony-na-gladko/>)

59 The perfume *Les nombres d’or amber* by Mona di Orio.

60 The wine *Nero d’Avola 2010* of Gigliotto.

‘And even though I like to think of Nero as a brittle, uncouth Sicilian (with all his drawbacks), the shaven and polished Nero of Gigliotto appealed to me [...]. It is a wine-muscleman, well built, fleshy, thick, with a licorice and clove nose. I would say this wine has a strong personality.’

The noun *osilek* ‘muscleman’, which describes the wine, is motivated by the term *ciało wina* ‘body of wine’, while the term *character wina* ‘character of wine’ is elaborated in a description of two wines as a brittle and uncouth Sicilian versus a version made by Gigliotto—more elegant and civilized, but still having a strong personality.

In texts about music, the **CLOTHES** frame is a popular source. The creation of music is quite often compared to making clothes (46):

- (46) Melancholijny klimat każdego utworu spotęgowany smutnym, delikatnym i czystym głosem lidera obsztyj jest równym ściegiem profesjonalnej aranżacji, która nie raz przyjemnie zaskakuje. (<https://magazyngitarzysta.pl/muzyka/recenzje/rock-i-punk/7627-little-hell>)
 ‘The melancholic climate of each song, escalated by the sad, delicate, and clear voice of the bandleader, is edged with even stiches of professional arrangement, which nicely amazes us often enough.’

The metaphorical lexicalized musical terms: *kawałek* ‘piece of music’ or *material* ‘fabric, material’, i.e., a music recorded on an album, seem to motivate this more creative usage of **CLOTHES** FEs.

6.5.2 Name of a subject

According to Ritchie (2017b), a “[s]ingle word can also index, or activate, metaphorical stories” (133). Quite a lot of metaphors in Synamet are also activated by the names of perfumes, musical albums, or songs. For example, in (47), the author describes the scent as dark, which relates to the perfume’s name *La Nuit Trésor* ‘night treasure’:

- (47) [Paczula] także odpowiedzialna jest za tresorowy mrok⁶¹, który jest z nami przez cały czas wybrzmiewania zapachu.
 ‘[Patchouli] is also responsible for Tresor’s darkness, which is with us the whole time the aroma resonates.’

In example (48), the name of the perfume *Showtime* triggers a set of associations with a performance—*gwiazda* ‘star’, *diwa* ‘diva’, Selena Gomez (American singer,

61 The perfume *La Nuit Trésor* by Lancôme.

actress, and producer), *sceniczny demon* ‘stage demon’, and *dziewczyna z chórką* ‘back-up girl’.

- (48) Perfumy Showtime⁶² mają sprawić, że każda kobieta poczuje się jak gwiazda. [...] Showtime nikogo nie przemieni w diwę, no chyba, że ktoś widzi scenicznego demona w Selenie Gomez i zbliżonych jej wiekiem koleżankom. Ale jeśli ktoś chce się wycofać i być dziewczyną z chórką – proszę bardzo, polecam.
(<http://edpholiczka.pl/2014/09/kylie-minogue-showtime-edp.html>)
‘Showtime perfume is supposed to make every woman feel like a star. [...] Showtime isn’t going to turn anyone into a diva, unless you happen to count Selena Gomez (or some colleagues of hers, close in age) among stage demons. But if you want to stand back and be a back-up girl—go ahead and try it.’

Example (49) is motivated by the author’s nontrivial associations with the reviewed perfume *Santal Blanc* by Serge Lutens. For the author, the perfume is reminiscent of the perfume *Christopher Columbus Pour Homme*. Therefore, he calls it “Columbus in a light version”. As is well known, Christopher Columbus was an explorer and sailor who completed four expeditions across the Atlantic Ocean. The author associates Columbus with his ships and creates a story about perfume testing as if it were sailing.

- (49) Zaaplikowałem małego psika na łapę... na razie trzymam się dzielnie, gdy „Columbus w wersji light” rozwija żagle i wypływa w rejs po mojej skórze... na razie czuję się dobrze... choć miarowe „bujanie” statku powoduje pewien dyskomfort... dobrze, że miska, tfu burta jest blisko... intensywna nuta sandałowca i rozmarynu stopniowo mięknie i do głosu dochodzi delikatna nuta róży... czyżby góra lodowa?
(<https://perfumomania.wordpress.com/2012/03/25/serge-lutens-santal-blanc-edp-czyli-rosemary-or-rosemary-child/>)
‘I dosed some perfume on my hand... I keep up so far when “Columbus in the light version” spreads sail and sets off to undertake a voyage across my skin... I feel good so far ... although the regular “floating” of the ship causes some discomfort ... it is good that a bowl, ugh—a port side is close ... an intense note of sandalwood and rosemary softens little by little and a delicate note of rose comes to the forefront ... can that be an iceberg?’

In example (50), the metaphorical story is directly triggered by the name of the perfume—*J’Adore Voile* by Christian Dior. In French, the noun *voile* means ‘veil’. The author associates the perfume’s name with the words *mgiła* ‘haze’, *woalka* ‘veil’, and *tiul* ‘tulle’.

62 The perfume *Showtime* by Kylie Minogue.

- (50) J'Adore Voile de Parfum jest cudną mgłą, która otacza ciało, tworząc na około niej aurę intymności i elegancji. [...] W pierwszej godzinie przypomina mi woalkę, choćby ślubną. Jest blisko skóry (ale zachowuje dystans!), idealnie podkreśla kształt, nadaje pewnej tajemnicy. Jednak po pewnym czasie, kiedy zapach staje się słodszy, bardziej miękki i pudrowy, przypomina mi tiul. Miękki, idealnie opadający na ciało – zwiewny i romantyczny.

(<http://edpholiczka.pl/2013/06/dior-jadore-voile-de-perfu.html>)

'J'Adore Voile de Parfum is a marvelous haze, which embosoms a body, creating all around an aura of intimacy and elegance. [...] During the first hour, it reminds me of a veil, even a bridal veil. It is close to my skin (but keeps its distance!), ideally accentuates my body shape, adds some mystery. However, after some time, when the aroma becomes sweeter, softer, and powdery, it reminds me of tulle. Soft, ideally covering the body—flowy and romantic.'

In example (51), the metaphorical description of an album is inspired by its name *Air* as well as by song titles on the album—*Under the Blues Sky* and *Silver Clouds*, see:

- (51) Niczym arktyczny front z głośników Waszych odtwarzaczy powinna nadciągnąć i opanować drogiego słuchacza muzyka Konrada Kucza. Zrobił on wielką świąteczną frajdę wydając album "Air" nad którym pracował w przeciągu ostatnich dwóch lat. [...] Co usłyszymy na płycie? Dużo powietrza, świeżego powietrza, które przyda się wszystkim balangowiczom. Sekwencyjne granie okraszone ambientową przestrzenią. Wraz z autorem łagodnie fruniemy i dajemy się porwać powietrznym prądom, zarówno tym ciepłym (*Under the Blue Sky*) jak i zimnym (*Silver Clouds*). Oddychajcie głęboko i poczujcie te "powietrze" każdym skrawkiem Waszego ciała. (<https://www.laboratoriummuzycznychfuzji.com/2016/01/konrad-kucz-air.html>)

'The music by Konrad Kucz should gather and overrun a dear listener like an arctic weather front from loudspeakers. Kucz gave me great holiday pleasure finishing the album "Air" on which he has worked for the last two years. [...] What will we listen to on that album? A lot of fresh air, fresh air that would do good for all party animals. Sequential playing decorated with an ambient space. Alongside the author, we softly fly and let ourselves be carried away by airflows both warm (*Under the Sky*) and cold (*Sliver Clouds*). Breathe deeply and feel this "air" with every inch of your body.'

In example (52), the author of the album's review was inspired by a fragment of a song. The leader of the band *Popszysze* on the album *Popsute* 'Broken' in the song *Letko* sings *piasku, piasku coraz więcej* 'sand, sand, more sand'.

- (52) Idę, idę, idę coraz głębiej. Piasku, piasku, piasku coraz więcej śpiewa Marciszewski w utworze *Letko* i tym samym w pewien sposób podsumowuje kierunek, w jakim podąża jego zespół na drugim albumie. Od „*Popsute*” wieje pustynią, ale *Popszysze* nie samym piachem żyje, niczym dźwiękowe miraża pojawiają się często psychodeliczne improwizacje i oniryczne wojaże.

(<https://www.laboratoriummuzycznychfuzji.com/2015/04/probowkowe-recenzje-popsysze-popsute.html>)

‘I go deeper and deeper. Sand, sand, more sand—as Marciszewski sings in the song Letko and thereby summarizes a direction in which his band is going on the second album. “Broken” is like a desert, but Popsysze does not live by sand alone, psychedelic improvisations and oneiric voyages often appear like sonic mirages.’

The word *piasek* ‘sand’ from the song triggers the metaphorical associations with walking across a desert and experiencing mirages.

6.5.3 Situational and cultural factors

Some metaphorical mappings seem to be influenced by situational and cultural factors. For example, personification in wine and perfumery discourses takes a different form according to stereotypical beliefs. In the perfumery discourse, perfumes are often portrayed as women, while in wine reviews, wine is usually portrayed as men (53)-(57). According to Classen *et al.* (2002), since perfumes are considered to be a product for women, “the great majority of perfumes and colognes are therefore created for and directed to women” (189). In most perfume commercials, models or famous actresses appear, e.g., Julia Roberts (*La Vie Est Belle*), Cate Blanchett (*Si*), and Keira Knightley (*Coco Mademoiselle*). Therefore, it is not surprising that perfumes are often personified as women.

- (53) Gdybym miała zamknąć oczy i oddać obraz kojarzący się z London⁶³, to w ogrodzie skąpanym w ciepłym deszczu widzę subtelną i radosną kobietę w jasnej, wiosennej sukience. Jej kobiecość cudownie kontrastuje z lekko infantylnym, nastoletnim śmiechem.

(<https://nezd deluxe.pl/2013/08/burberry-london-kwiaty-ktorych-nie-ma.html>)

‘If I closed my eyes and described the image, which I associate with London, I would see a garden in the warm rain and in it—a subtle and joyful woman wearing a bright, spring dress. Her femininity wonderfully contrasts with her somewhat infantile, teenage laugh.’

- (54) Rare Pedro Ximenez:⁶⁴ rodzynki, figa, kandyzowane pomarańcze, miód, kawa, cytryna – brzmi świetnie? Tak właśnie pachnie i smakuje ten słodki Andaluzyjczyk. (<http://blogi.magazynwino.pl/rybak/czym-kusi-marksspencer/>) ‘Rare Pedro Ximenez: raisins, fig, candied oranges, honey, coffee, lemon—sounds great? Just like that does this sweet Argentinian smell and taste.’

63 The perfume *London* by Burberry.

64 The *Rare Pedro Ximenez* sherry.

- (55) czerwone verde⁶⁵ nie jest winem, które da się łatwo lubić [...]; jest jak koślawy, nieśmiały kuzyn [...] białego vinho verde, które w gorące letnie wieczory z powodzeniem lansuje się na stołach, pławiąc w ochach i achach, szczypiąc bąbelkami, kwasem obdzielając na bogato.

(<http://blogi.magazynwino.pl/rybak/verde-w-pasach-1/>)

‘red verde is not a likeable wine [...]; he is like a crooked, shy cousin of [...] the white vinho verde who during hot summer nights successfully shows off on tables, basks in oohing and ahing, pinches with his bubbles, and shares his acidity opulently.’

In examples (56) and (57), a broad paralinguistic context is needed to understand what activates the metaphorical transfer.

- (56) Emerald Reign⁶⁶ zapowiadany jest jako perfumeryjny tygrys władający przestrzenią. Mocne nuty, butny opis, a tygrys... leniwy.

‘Emerald Reign was announced as a perfumery tiger, which reigns over the space. Strong notes, arrogant description, and the tiger ... is lazy.’

- (57) Pozwól, aby jedwabne wstążki perfum zawiązały Ci dłonie i usta i mówiły jedynie zapachem...⁶⁷

‘Let the silk ribbons bind your hands and mouth, and let them talk just with their aroma.’

The perfume *Emerald Reign* by House of Sillage in (56) is described as a tiger. There is no physical or structural trigger—the metaphor is motivated by the fact that the limited edition bottle of perfume is decorated with a silver tiger figure with green eyes. In the case of (57), the metaphor is activated by two factors: the name of the perfume *Nouez moi*, which means ‘bind me’, and the appearance of the bottle, which has a silver ribbon on top.

6.6 The function of metaphor

The central place of metaphor in human reasoning (as is stated in CMT) raises some doubts. According to Sperber and Wilson (2008),

metaphor is a range of cases at one end of a continuum that includes literal, loose, and hyperbolic interpretations [...] metaphorical interpretations are arrived at in exactly the same way as these other interpretations. There is no mechanism specific to metaphor, no interesting generalisation that applies only to them. (100)

65 Red vinho verde.

66 The perfume *Emerald Reign* by House of Sillage.

67 The perfume *Nouez moi* by House of Sillage.

The radical discrepancy between metaphor productivity in different blog entry categories in the Synamet corpus undermines the central ontological role of metaphors in thought. Although the focus in the Synamet corpus was on synesthetic metaphors, some texts were devoid of any metaphorical language. Therefore, it is necessary to consider that the functions of metaphor are more diversified (Zawisławska 2011). According to Steen (2008: 231), there are three main functions of metaphorical language: a) filling lexical gaps in the language (*naming*), b) providing a new interpretative frame for less understandable concepts (*framing*), and c) offering an alternative view of a referent (*changing*). In the text gathered in the Synamet corpus, we observe all the above-mentioned functions of metaphorical language. Some lexicalized synesthetic metaphors are used as terms (thereby filling the gaps in a specialized language)—e.g., *a note* (a component of perfume), *the head* (the initial smell of a perfume, which is the faintest), or a *body of wine* ‘weight of wine on the palate’. Framing in the analyzed texts is also often used—e.g., smell is conceptualized as music. The smallest elements (ingredients of a perfume) are notes, sets of elements are chords, and the perfume as a whole is a composition. The alternative view of the referent seems to be the central one in the BEER, MUSIC, PERFUME, and WINE sub-corpora. Authors of the reviews use creative and elaborated metaphors to describe their subjective views of the subjects, see (58)–(59):

- (58) Orzechoorzech.⁶⁸ Morze orzechów. Morzech. Najpierw gorzki i wilgotny, świeżo rozłupany, plastycznie przedstawiony. Potem parny i zatykający, słodki, gęsty miąższ, nieruchomiejący, tężejący. Słusznie przypuszczałam, że będzie podobny do Manoumalii - jest. Tyle że dużo słodziej, dużo bardziej “w twarz”. Czyli gorzej. Niemniej bardzo smacznie.
(<http://nostrills.blox.pl/2011/04/Parfumerie-Generale-Praline-de-Santal.html>)
‘Nutty nut. A sea of nuts. Seanut. At first, it is bitter and moist, freshly cracked, vividly pictured. Then, it becomes steamy and clogging, sweet, with a dense flesh, still, and clotted. I have correctly assumed that it would resemble Manoumalia⁶⁹—it certainly does. But it is much sweeter, much more “face-to-face”. In other words—it is worse. Still very delicious.’

In (58), the author creates a set of metaphorical neologisms based on one of the essential oils in the perfume (hazelnut): *orzechoorzech* ‘nutty nut’, a compound made of duplication of the word *orzech* ‘nut’, and *morzech* ‘sea of nuts, “seanut”’, a compound made of two nouns *morze* ‘sea’ and *orzech* ‘nut’. The olfactory perception is subjectively portrayed as eating very sweet nuts.

68 The perfume *Praline de Santal* by Parfumerie Generale.

69 The perfume *LezNez Manoumalia* by Sandrine Videault.

In the next example (59), the aroma of the perfume *Felanilla* by Parfumerie Generale is surprisingly and unexpectedly associated with a smiling puffball, even though there is no such ingredient in the perfume.

- (59) Felanilla stawia mi przed oczyma obraz uśmiechniętej, zadowolonej z siebie purchawki. To taki specyficzny grzyb, w ogóle grzybem nie pachnący, składający się z aksamitnej skóry i proszkowego wnętrza – a właśnie tak wygląda na mnie Felanilla przez kilka pierwszych godzin. Bardzo lubię taką wanilię, gorzkawą, suchą i skórzastą, pozbawioną wszystkich ciekących ozdobników, solidnie przypieczoną i przewianą, schłodzoną irysem.

(<http://nosthrills.blox.pl/2009/01/Parfumerie-Generale-Felanilla.html>)

'Felanilla puts before my eyes a picture of a smiling, self-satisfied puffball. It is a specific mushroom, which doesn't smell like mushroom at all, and which is composed of velvety skin and a powdery inside—and Felanilla looks just like that on me for first couple of hours. I like such vanilla very much, a little bit bitter, dry and leathery, deprived of all leaking ornaments, toasted really well and winnowed, cooled by an iris.'

Yet another function of metaphor should be interpolated—the esthetic one. In the wine or perfumery discourses, authors tend to use metaphors in order to attract attention and engage the reader. It is the element of a convention and a specific style. In some metaphors, there is no analogy between conceptual domains (in terms of CMT) and there is no mapping between more abstract concepts and more physical experiences—it just plays with the imagination and language, see (60).

- (60) La Petite Robe Noire Couture⁷⁰ to po prostu zapach uroczy, mimo że główna oś przywodzi na myśl figury znane już z popisów innych perfum, chociażby La Petite Robe Noire EDP. Ten słodki pudrowy likierek przypomina high-life w nowobogackim stylu – kolorowe stroje, pióra [...]. Za czołówkę robią maliny i wiśnie, występy gwiazd – wetiwer, mech i róże, a wielki finał to owocowy wodewil prowadzony przez paczulę po pudrowej scenie. [...] Wszystkie te składniki przenikają się przez wiele godzin, tworząc naprawdę kuszącą rewiew. Tutaj tylko jedna uwaga – La Petite Robe Noire Couture to raczej show dla dojrzałych tancerek.

(<https://www.opinie-perfumy.pl/guerlain-la-petite-robe-noire-couture/>)

'La Petite Robe Noire Couture is a lovely smell even though the main axis resembles dance moves already used in the shows of other perfumes, for instance La Petite Robe Noire EDP. This sweet, powdery liqueur is reminiscent of high-life in a nouveau riche style—colorful costumes, and feathers [...]. The leaders are raspberries and cherries, the performing stars are vetiver, moss, and roses, and the great finale is

70 The perfume *La Petite Robe Noire Couture* by Guerlain.

a fruity music hall lead by patchouli on a powdery scene. [...] All those ingredients interpenetrate for hours creating a really seductive revue. Only one warning—La Petite Robe Noire Couture is a show for rather mature dancers.’

The lack of semantic and pragmatic analysis in CMT results in ignoring another important function of metaphor—evaluation. Winter (2019) argues that phrases such as *sweet melody* do not involve mapping between a source and a target, but rather a transfer of evaluative content, and hence the evaluative function is more important than the descriptive one in sensory vocabulary. The analysis of metaphors in the Synamet corpus supports this hypothesis. In many cases, metaphors serve as a way of evaluating subjects. For example, in the phrase *nowy Dior zionie akordem kwiatowym* ‘the new Dior breathes with a flower chord’ the verb *zionąć* ‘breathe’ is used, which in Polish is evaluated negatively, e.g., *zionąć ogniem* ‘breathe with fire’, *zionąć nienawiścią* ‘to emanate, to ooze with hate’, or *zionąć smrodem* ‘to emanate, to ooze with stench’. Therefore, there is no mapping between the **PERSON** frame and the **SMELL** frame; instead, the author signals that the perfume has a smell that is too strong.

In the next example, *wino ma ciało chudego chłopca* ‘wine has the body of a skinny boy’, the adjective *chudy* ‘skinny’ is negatively loaded in Polish (as opposed to the adjective *szczupły* ‘slender, slim’). In this case, the lexicalized metaphor *ciało wina* ‘body of wine’ (which might be interpreted as the metaphor WINE IS A PERSON) was expanded by the evaluation of the sensation by a negative description of the metaphorical “body”. In example (61), the same metaphor is much more elaborated, and this time the evaluation is positive since the author describes the “body” of *Carruades de Lafite 2002* wine as being as beautiful as Scarlett Johansson’s curves. Scarlett Johansson is a culturally entrenched hallmark of an attractive, sexy woman.

- (61) [...] gwiazdą wieczoru zostało Carruades de Lafite 2002 (tak, ten Lafite). Znakomite wino, sprawiające wrażenie wyrzeźbionego w migdałowym drewnie (to pewnie nuta z aromatu...), uderzające finezją i powściągliwością, a jednocześnie prezentujące okrągłości których nie powstydzila by się Scarlett Johansson.

(<http://vitisvinifera.blox.pl/html>)

[...] the star of the night was Carruades de Lafite 2002 (yes, yes, that Lafite). Great wine, which gives the impression of being carved out of almond wood (this must be a note of its aroma...), striking with its finesse and temperance and at the same time revealing curves that Scarlett Johansson would not be ashamed of.

In example (62), the perfume *Insolence* by Guerlain is described as a young girl. But the evaluation is negative since the author of the text uses negatively laden LUs: *agresorka* ‘aggressor’, *bezczelny* ‘impertinent’, *pyskaty* ‘loudmouthed’, *panica*

‘neg. missy’, *wyszczekany* ‘lippy’. Moreover, the overly intense smell of the perfume is described as being too loud.

- (62) Jeśli znacie perfumy Insolence to pewnie wiecie, że trudno o większą agresorkę. To bezczelna i pyskata pannica, która myli swoją młodość z pięknnością. To dla mnie perfumy „wyszczekane”, które uwodzą swoją młodzieńczością i dawką szaleństwa. Kiedy jednak noszę je wcale nie jestem w stanie dostrzec ich piękna, przytłacza mnie ich głośność.

(<https://edpholiczka.pl/2015/07/guerlain-my-insolence.html>)

‘If you know the Insolence perfume, you know that it is hard to find a greater aggressor. This is an impertinent and loudmouthed missy who mistakes her youth for beauty. For me, the perfume is “lippy” and seduces with its juvenility and a dose of craziness. When I wear it, I cannot recognize its beauty, I’m overwhelmed by its loudness.’

Although many metaphors in the Synamet corpus have an ontological function (as was discussed in the *Embodiment in synesthetic metaphors* section), the evaluative and esthetic functions are equally important. The most productive in synesthetic metaphors are blog entries that review beer, music, perfume, or wine. Therefore, it is not surprising that metaphorical language is used as a tool for presenting a particular, subjective impression of a given subject in an engaging way.

Conclusion

Building the Synamet corpus allowed us to observe many interesting features of synesthetic metaphors in naturalistic texts in the form of blogs. Frame semantics turned out to be a very promising method of metaphor description. Frames offered more a formal approach and deeper insight into the mappings between source and target. The deep semantic analysis of MUs showed that there is an internal logic of transfer between perceptual and non-perceptual frames. The mappings were motivated by embodied experience and analogies and/or similarities in frame structures. On the general level (e.g., personification), differences between sub-corpora within Synamet were imperceptible, but on a more extensive level of FEs, interesting differences were found. Only a small set of perceptual source FEs was common for the main thematic sub-corpora. Clements typical in one category were very rarely activated or never used in others, e.g., the *TEMPERATURE* element in the *TOUCH* frame was very frequent in the *PERFUME* category (114 MUs), rare in the *WINE* category (seven MUs), and absent in the *BEER* category. Although the *PERSON* frame was the most frequently activated source frame in all of the main categories, various elements were preferred. The *WINE* category frequently uses *BODY*, *BODY FEATURE*, and *BODY COMPOSITION* elements, while these elements are quite rare in the *BEER*, *MUSIC*, and *PERFUME* categories. It can be also assumed that more active frames and their elements determined more complex and diverse metaphors in a given discourse.

The analysis of strong synesthetic metaphors in the Synamet corpus undermined attempts to create a universal model of synesthesia in languages (Classen 1993; Ullmann 1957; Viberg 1984; Williams 1976). The analysis carried out within this project supports Werning *et al.*'s (2006) argument that models of verbal synesthesia posited in the literature are by no means universal and need to be constructed separately for each language. Moreover, the analysis of synesthetic metaphors in Synamet further showed that models of verbal synesthesia may differ depending on the variant or style used within the same language.

Metaphor in naturalistic texts is a much more complex and multidimensional phenomena than was anticipated by the theories. The analyzed discourse was characterized by multiple creative and elaborated metaphors. Blog authors preferred vividly expanded lexicalized metaphorical terms and story-like metaphorical descriptions. Likewise, mixed metaphors were frequently represented in the Synamet corpus. The annotation of the Synamet corpus clearly showed that CMT

alone is not the right choice for an analysis of metaphors in discourse. Reducing metaphor to a mere ornament is just as incorrect as a generalization that maps from one source to one target on a conceptual level. The simple dual schema *X is Y* is much too simplified to capture all of the diversity of creative metaphorical language. Lonergan and Gibbs (2016: 69) note that CMT alone is inadequate to explain how linguistic metaphors are understood. Pawelec (2006b) argues that “If ‘metaphor’ is redefined as a ‘mental mapping’, then the verbal, conventional level (‘the literal’) is no longer criterial for metaphoricity” (118–119). Reducing verbal metaphors to conceptual mappings or to *primary metaphors*, as posited by Grady (1997, 2005), does not help to explain the nature of metaphor and further creates more problems. Since primary metaphors are defined as mappings at a much lower level of conceptual elaboration and images that are much less rich and specific, they can be interpreted as the smallest units—metaphorical sememes. Pawelec (2005: 89) notes that semantic primitives by definition cannot be analyzed since they are the ultimate concepts. Moreover, gestalts as schemas organizing our experiences lose their identity when they are decomposed into smaller elements.

The CMT model of metaphor is too static to capture vivid and dynamic metaphorical expressions in discourse. The necessity of a more dynamic approach to metaphors is emphasized by many scholars (Cameron 2011; Cameron and Gibbs 2008; Eubanks 1999; Müller 2008, 2016, 2017; Nerlich 2011; Semino 2008; Wiben Jensen 2017; Wiben Jensen and Cuffari 2014). Gibbs and Cameron (2008) argue:

A crucial feature of a dynamical system is its balance of stability and variability – one reason we believe that the variability in metaphor performance (e.g., metaphors appearing as clusters and then seemingly disappearing), like many other aspects of human behavior, is best understood in dynamical terms. (68)

Semino (2008) notes that conceptual domains should be seen as flexible structures, “partly constructed on the basis of the textual input” (26).

The rigid and reductionist view of conceptual metaphor rules out all phenomena, which do not fit in the schema. The problem is that these atypical phenomena are atypical only from the perspective of the theory and are quite normal and frequent in naturalistic discourse. Another problem is that CMT does not explain the link between the conceptual level and its verbal manifestation (Hellsten 2002). In fact, a schema of conceptual metaphor is an arbitrary and simplified interpretation of metaphorical expressions in discourse (Pawelec 2005). Kubicka (2005: 60) notes that a metaphor emerges abruptly as a result of the global reorganization of mental structures, which is remarkably influenced by emotions and inaccessible to introspection. Therefore, we must

distinguish between the process of metaphorization (which is beyond our introspection) and the result—a verbal metaphor that can be analyzed. Ignoring the semantic level of metaphorical expression leads to the omission of the evaluative function of metaphors or to an insufficient explanation for why some synonyms are preferred in verbal metaphors. Ignoring the pragmatic level of verbal metaphor results in underrating the impact of cultural, social, and stylistic factors. The esthetic function, which is extremely important in the analyzed texts, was completely eliminated in CMT by overemphasizing the conceptual nature of metaphors. The separation of conceptual and linguistic levels results in deprivation of the actual verbal form of metaphor, which is a dynamic, complex, and context-dependent structure.

List of figures

Fig. 1:	Williams' (1976000: 463) model of verbal synesthesia.	29
Fig. 2:	The main window of the ATOS editor.	41
Fig. 3:	The editor of metaphorical units in ATOS.	42
Fig. 4:	Selecting a topic in a text.	43
Fig. 5:	The topic in the main ATOS window.	44
Fig. 6:	Selection of an activator in the main ATOS' window.	46
Fig. 7:	The general characteristics of a MU in the ATOS editor of metaphorical unit.	48
Fig. 8:	The source frame description in the editor of MU.	49
Fig. 9:	The target frame description in the editor of MU.	49
Fig. 10:	The initial step of an indirect metaphor annotation in the main window of ATOS.	52
Fig. 11:	Annotation of a mediator in an indirect metaphor (example—bukiet 'bouquet).	52
Fig. 12:	The last step of an indirect metaphor annotation (konstrukcja bukietu 'construction of bouquet').	53
Fig. 13:	Metaphorical productivity and number of tokens in each category of the Synamet corpus.	60
Fig. 14:	Pearson residuals of tokens and metaphors in Synamet categories.	60
Fig. 15:	The raw frequencies of perceptual frames as sources and targets in MUs.	67
Fig. 16:	Pearson residuals of source and target frames in strong synesthetic metaphors (p-value < 0.0001).	68
Fig. 17:	Pearson residuals of the source frames' frequencies in Synamet's categories: 1) BEER, 2) COFFEE, 3) COSMETICS, 4) CUISINE, 5) CULTURE, 6) MASSAGE, 7) MUSIC, 8) PERFUME, 9) WELLNESS, 10) WINE, 11) YERBA.	73
Fig. 18:	The most frequent non-perceptual source frames in Synamet.	75
Fig. 19:	Perceptual frame elements in Synamet.	78
Fig. 20:	The most frequent elements of perceptual source frames in Synamet.	79
Fig. 21:	Elements of non-perceptual source frames in Synamet most frequently evoked in MUs.	80

Fig. 22:	Pearson residuals of word forms and lexemes evoking perceptual and non-perceptual frames.	112
Fig. 23:	Frequency of parts of speech in Synamet.	113
Fig. 24:	Lexical items evoking perceptual frames in Synamet.	114
Fig. 25:	The raw frequencies of parts of speech for the individual perceptual frames in Synamet.	114
Fig. 26:	The non-perceptual frames with the biggest sets of lexemes.	116
Fig. 27:	Grammatical forms of metaphorical units in Synamet.	126
Fig. 28:	Pearson residuals of metaphorical and non-metaphorical collocates with the adjectives <i>chłodny</i> 'cool' and <i>zimny</i> 'cold' in Synamet.	131
Fig. 29:	Pearson residuals of metaphorical and non-metaphorical collocates with the adjectives <i>ciemny</i> 'dark' and <i>mroczny</i> 'dark, obscure' in Synamet.	135
Fig. 30:	Typology of metaphorical units in Synamet.	142
Fig. 31:	Percentage of metaphor types in the Synamet corpus.	143

List of tables

Tab. 1:	List of topic keywords.	45
Tab. 2:	The list of grammatical descriptions of activators in Synamet.	46
Tab. 3:	Cohen ‘kappa’ test for the annotator inter-agreement.	55
Tab. 4:	Number of blog entries, tokens, and MUs in each category.	59
Tab. 5:	Five-number summary of the Synamet categories.	59
Tab. 6:	Standardized Pearson residuals of tokens and metaphors in Synamet.	61
Tab. 7:	The TOUCH frame’s structure in Synamet.	66
Tab. 8:	Standardized Pearson residuals of the source and target frames in the strong synesthetic metaphors (p-value < 0.0001). .	68
Tab. 9:	Raw frequencies of source/target pairs of frames in strong synesthetic metaphors.	69
Tab. 10:	Pearson residuals of source/target pairs of frames in strong synesthetic metaphors.	69
Tab. 11:	Source-and-target frames in the BEER category (p-value < 0.0001).	69
Tab. 12:	Source-and-target frames in the COFFEE category (p-value < 0.0001).	70
Tab. 13:	Source-and-target frames in the COSMETICS category (p-value < 0.0001).	70
Tab. 14:	Source-and-target frames in the CUISINE category (p-value < 0.0001).	70
Tab. 15:	Source-and-target frames in the CULTURE category (p-value < 0.0001).	71
Tab. 16:	Source-and-target frames in the MASAGE category.	71
Tab. 17:	Source-and-target frames in the MUSIC category (p-value < 0.0001).	71
Tab. 18:	Source-and-target frames in the PERFUME category (p-value < 0.0001).	71
Tab. 19:	Source-and-target frames in the WELLNESS category.	72
Tab. 20:	Source-and-target frames in the WINE category.	72
Tab. 21:	Source-and-target frames in the YERBA category.	72
Tab. 22:	Standardized Pearson residuals for source frames in the text categories in Synamet.	73
Tab. 23:	Source/target pairs of frames in weak synesthetic metaphors (standardized Pearson residuals, p-value < 0.0001).	75

Tab. 24:	Frequency of non-perceptual frames in BEER, MUSIC, PERFUME, and WINE.	76
Tab. 25:	Standardized Pearson residuals of frames and their elements in Synamet (p-value = 0.005255).	78
Tab. 26:	Number of evoked elements in the non-perceptual frames (10 and more elements).	80
Tab. 27:	Pairs of elements of the SMELL target frame and the other perceptual frames.	81
Tab. 28:	Pairs of elements of the SMELL frame and elements of the non-perceptual frames.	82
Tab. 29:	Pairs of elements of the TASTE target frame and the other perceptual frame elements.	83
Tab. 30:	Pairs of elements of the TASTE frame and elements of the non-perceptual frames.	84
Tab. 31:	Pairs of elements of the HEARING target frame and the other perceptual frame elements.	84
Tab. 32:	Pairs of elements of the HEARING frame and elements of the non-perceptual frames.	85
Tab. 33:	Pairs of elements of the VISION target frame and the other perceptual frame elements.	85
Tab. 34:	Standardized Pearson residuals for activation of source perceptual and non-perceptual frame elements in WINE, BEER, MUSIC, and PERFUME categories (p-value < 001).	85
Tab. 35:	The HEARING frame elements evoked in texts gathered in the BEER, PERFUME, and WINE categories.	86
Tab. 36:	The MULTIMODAL PERCEPTION frame elements evoked in texts gathered in the BEER, MUSIC, PERFUME, and WINE categories.	87
Tab. 37:	The TASTE frame elements evoked in texts gathered in the BEER, MUSIC, PERFUME, and WINE categories.	88
Tab. 38:	The TOUCH frame elements evoked in texts gathered in the BEER, MUSIC, PERFUME, and WINE categories.	88
Tab. 39:	The VISION frame elements evoked in MUs of the BEER, MUSIC, PERFUME, and WINE categories.	90
Tab. 40:	Elements of non-perceptual frames evoked in the MUs of the BEER category.	91
Tab. 41:	Elements of non-perceptual frames evoked in the MUs of the MUSIC category.	92
Tab. 42:	Elements of non-perceptual frames evoked in the MUs of the PERFUME category.	94

Tab. 43:	Elements of non-perceptual frames evoked in the MUs of the WINE category.	97
Tab. 44:	Models of verbal synesthesia in Synamet and in the BEER, MUSIC, PERFUME, and WINE categories.	101
Tab. 45:	Analogical elements in the HEARING and SMELL frames.	109
Tab. 46:	Standardized Pearson residuals of word forms and lexemes evoking perceptual and non-perceptual frames.	112
Tab. 47:	Standardized Pearson residuals of the frequency of parts of speech in Synamet and FrameNet.	113
Tab. 48:	Standardized Pearson residuals of the frequency of parts of speech evoking perceptual and non-perceptual frames in Synamet.	113
Tab. 49:	The standardized Pearson residuals of frequencies of parts of speech evoking perceptual frames in Synamet.	115
Tab. 50:	Keywords that most frequently evoke the HEARING frame.	117
Tab. 51:	Keywords that most frequently evoke the MULTIMODAL PERCEPTION frame.	118
Tab. 52:	Keywords that most frequently evoke the SMELL frame.	119
Tab. 53:	Keywords that most frequently evoke the TASTE frame.	120
Tab. 54:	Keywords that most frequently evoke the TOUCH frame.	121
Tab. 55:	Keywords that most frequently evoke the VISION frame.	122
Tab. 56:	Keywords that most frequently evoke non-perceptual frames. ..	123
Tab. 57:	Standardized Pearson residuals of noun types evoking perceptual and non-perceptual frames (p-value < 0.0001).	124
Tab. 58:	Standardized Pearson residuals of chłodny 'cool' and zimny 'cold' adjectives in literal and metaphorical collocates (p-value < 0.0001).	131
Tab. 59:	Standardized Pearson residuals of ciemny 'dark' and mroczny 'dark, obscure' adjectives in the literal and metaphorical collocates (p-value < 0.0001).	135
Tab. 60:	Differences in literal senses of the adjectives ciemny 'dark' and mroczny 'dark, obscure'.	136
Tab. 61:	Mapping in the metaphors knowing is seeing (Sullivan 2006: 393).	138
Tab. 62:	Mapping the source frame onto the target frame in the narrative metaphor of example (36).	150

Bibliography

- Arutjunowa, N. D. (1981). Metafora językowa (II) (Składnia i leksyka). *Teksty* 1(55), 138–153.
- Auvray, M., & Farina, M. (2017). Patrolling the boundaries of synaesthesia: A critical appraisal of transient and artificially induced forms of synaesthetic experiences. In Deroy, O. (Ed.), *Sensory blending. On synaesthesia and related phenomena*. Oxford, England: Oxford University Press, 248–274.
- Badyda, E. (2013). “Upadły anioł zmysłów?”: *Metaforyka zapachu i percepcji węchowej we współczesnej polszczyźnie*. Gdańsk: Wydawnictwo Uniwersytetu Gdańskiego.
- Bańko, M. (2004). *Słownik porównań*. Warszawa: PWN.
- Bańko, M. (Ed.). (2000). *Inny słownik języka polskiego PWN*. Warszawa: Wydawnictwo Naukowe PWN.
- Barcelona, A. (2000). On the plausibility of claiming a metonymic motivation for conceptual metaphor. In Barcelona, A. (Ed.) *Metaphor and metonymy at the crossroads: A cognitive perspective*. Berlin & New York: Mouton de Gruyter, 31–58.
- Barnden, J. (2016). Mixed metaphors. Its depth, its breadth, and a pretense-based approach. In Gibbs Jr, R. W. (Ed.), *Mixing metaphor*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 75–111.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge, England: Cambridge University Press.
- Bartmiński, J. (2001). *Styl potoczny*. In Bartmiński, J. (Ed.), *Encyklopedia kultury polskiej XX wieku. Tom 2. Współczesny język polski*. Lublin: Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej.
- Bartmiński, J., & Pajdzińska, A. (Ed.). (2008). *Podmiot w języku i kulturze*. Lublin: Wydawnictwo UMCS.
- Bartmiński, J., Niebrzegowska-Bartmińska, S., & Nycz, R. (Eds.). (2004). *Punkt widzenia w języku i kulturze*. Lublin: Wydawnictwo UMCS.
- Biłas-Pleszak, E. (2007). “Zobaczyć dźwięk” – metafory synestezyjne jako przykład “korespondencji zmysłów”. *Język Artystyczny* 13, 157–166.
- Black, M. (1949). *Language and philosophy; Studies in method*. Ithaca, NY: Cornell University Press.
- Black, M. (1971). Metafora. *Pamiętnik Literacki* LXII, Z. 3, 217–234.

- Black, M. (1993). More about metaphor. In Ortony, A. (Ed.), *Metaphor and thought*. Cambridge, England: Cambridge University Press, 19–41.
- Bogusławski, A. (1971). O metaforze. *Pamiętnik Literacki LXII*, Z. 4, 113–126.
- Boroditsky, L., Schmidt, L. A., & Phillips, W. (2003). Sex, syntax, and semantics. In Gentner, D., & Goldin-Meadow, S. (Eds.), *Language in the mind: Advances in the study of language and thought*. Cambridge, MA: MIT Press, 61–79.
- Boryś, W. (2005). *Słownik etymologiczny języka polskiego*. Kraków: Wydawnictwo Literackie.
- Bronikowska, R. (2002). Nazwy cech percypowanych zmysłem smaku jako określenia uczuć. *Poradnik Językowy* z. 6, 43–58.
- Bronikowska, R. (2006). *Przymiotniki oznaczające cechy przedmiotów odbierane zmysłem dotyku we współczesnej polszczyźnie*. Warszawa (Doctoral dissertation, University of Warsaw).
- Bronikowska, R. (2007). Przymiotniki oznaczające cechy przedmiotów odbierane zmysłem dotyku we współczesnej polszczyźnie. In Dobaczewski, A. (Ed.), *Studia nad współczesną polszczyzną. Gramatyka, semantyka, pragmatyka*. Toruń: Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, 241–250.
- Browse, S. (2016). Revisiting text world theory and extended metaphor: Embedding and foregrounding extended metaphors in the text-worlds of the 2008 financial crash. *Language and Literature* 25(1), 18–37.
- Brugman, C. (1990). What is the invariance hypothesis? *Cognitive Linguistics* 1–2, 257–266.
- Bruner, J. S. (2009). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.
- Bugajski, M. (2004). *Jak pachnie rezeda. Lingwistyczne studium zapachów*. Wrocław: Atut.
- Buttler, D. (1978). *Rozwój semantyczny wyrazów polskich*. Warszawa: Wydawnictwo Uniwersytetu Warszawskiego.
- Caballero, R., & Suárez-Toste, E. (2010). A genre approach to imagery in winespeak: Issues and prospects. In Low, G., Deignan, A., Cameron, L., & Todd, Z. (Eds.), *Researching and applying metaphor in the real world*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing, 265–287.
- Cacciari, C. (2008). Crossing the senses in metaphorical language. In Gibbs Jr, R. W. (Ed.), *The Cambridge handbook of metaphor and thought*. Cambridge, England: Cambridge University Press, 425–443.
- Cain, W. S. (2012). History of research on smell. In Carterette, E. C., & Friedman, M. P. (Eds.), *Handbook of perception*. Volume VIa: *Tasting and*

- smelling*. New York, NY/San Francisco, CA/London, England: Academic Press, 197–229.
- Cameron, L. (2003). *Metaphor in educational discourse*. London, England/New York, NY: Continuum.
- Cameron, L. (2007). The affective discourse dynamics of metaphor clustering. *Ilha do Desterro A Journal of English Language, Literatures in English and Cultural Studies* 53, 41–62.
- Cameron, L. (2011). *Metaphor and reconciliation. The discourse dynamics of empathy in post-conflict conversations*. New York, NY: Routledge.
- Cameron, L. (2016). Mixed metaphors from a discourse dynamic perspective: A non-issue? In Gibbs Jr, R. W. (Ed.), *Mixing metaphor*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 17–30.
- Cameron, L., & Low, G. (Eds.) (1999). *Researching and applying metaphor*. Cambridge, England: Cambridge University Press.
- Cameron, L., & Deignan, A. (2006). The emergence of metaphor in discourse. *Applied Linguistics* 27(4), 671–690.
- Cameron, L., & Maslen, R. (2010). Identifying metaphors in discourse data. In Cameron, L., & Maslen, R. (Eds.), *Metaphor analysis: Research practice in applied linguistics, social sciences and the humanities*. London, England: Equinox.
- Carnap, R. (1947). *Meaning and necessity*. Chicago, IL: University of Chicago Press.
- Charniak, E. (1972). *Toward a model of children's story comprehension* (Doctoral dissertation, Massachusetts Institute of Technology).
- Charteris-Black, J. (2016). The “dull roar” and the “burning barbed wire pantyhose”: Complex metaphor in accounts of chronic pain. In Gibbs Jr, R. W. (Ed.), *Mixing metaphor* (Vol. 6). Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 155–176.
- Chastrette, M. (2002). Classification of odors and structure–odor relationships. In Rouby, C., Schaal, B., Dubois, D., Gervais, R., & Holley, A. (Eds.), *Olfaction, taste, and cognition*. Cambridge, England: Cambridge University Press, 100–116.
- Classens, C. (1993). *Worlds of sense: Exploring the senses in history and across cultures*. London, England/New York, NY: Routledge.
- Classen, C., Howes, D., & Synnott, A. (2002). *Aroma: The cultural history of smell*. London: Taylor & Francis e-Library.
- Cockiewicz, W. (2011). *Metaforyka Leśmiana. Analiza lingwistyczna*. Kraków: Księgarnia Akademicka.

- Crisinel, A. S., & Spence, C. (2010). As bitter as a trombone: Synesthetic correspondences in nonsynesthetes between tastes, flavors and musical notes. *Attention, Perception, & Psychophysics* 72(7), 1994–2002.
- Crisinel, A. S., & Spence, C. (2011). A fruity note: Crossmodal associations between odors and musical notes. *Chemical Senses* 37(2), 151–158.
- Crisp, P. (2005). Allegory, blending, and possible situations. *Metaphor and Symbol* 20(2), 115–131.
- Crisp, P. (2008). Between extended metaphor and allegory: Is blending enough? *Language and Literature* 17(4), 291–308.
- Crisp, P., Heywood, J., & Steen, G. (2002). Metaphor identification and analysis, classification and quantification. *Language and Literature* 11(1), 55–69.
- Croft, W. (1991). *Syntactic categories and grammatical relations*. Chicago, IL: University of Chicago Press.
- Croft, W., & Cruse, D. A. (2004). *Cognitive linguistics. Cambridge textbooks in linguistics*. Cambridge, England: Cambridge University Press.
- Cytowic, R. E. (2002). *Synesthesia: A union of the senses*. Cambridge, MA: The MIT Press.
- Dancygier, B., & Sweetser, E. (2014). *Figurative language. Cambridge textbooks in linguistics*. Cambridge, England: Cambridge University Press.
- David, O., Lakoff, G., & Stickles, E. (2018). Cascades in metaphor in the gun debate. In Petruck, M. R. L. (Ed.), *MetaNet*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 85–126.
- Day, S. (1996). Synaesthesia and synaesthetic metaphors. *Psyche* 2(32), 1–16.
- Deignan, A. (2000). Metaphors of persuasion. In Heffer, C. & Sauntson, H. (Eds.), *Words in context: A tribute to John Sinclair on his retirement*. Birmingham: University of Birmingham. (CD-ROM).
- Deignan, A. (2005). *Metaphor and corpus linguistics*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins.
- Deignan, A. (2008). Corpus linguistic data and conceptual metaphor theory. In Cavalcanti, M., Cameron, L., & Zanotto, M. S. (Eds.), *Confronting metaphor in use: An applied linguistic approach*. Amsterdam, Netherlands: John Benjamins Publishing, 149–162.
- Deignan, A. (2010). The evaluative properties of metaphors. In Low, G., Deignan, A., Cameron, L., & Todd, Z. (Eds.), *Researching and applying metaphor in the real world* (Vol. 26). Amsterdam, Netherlands: John Benjamins Publishing, 357–373.
- Deignan, A. (2017). Mapping and narrative in figurative communication. In Hampe, B. (Ed.), *Metaphor. Embodied cognition and discourse*. Cambridge, England: Cambridge University Press, 200–219.

- Deignan, A., & Semino, E. (2010). Corpus techniques for metaphor analysis. In Cameron, L., & Maslen, R. (Eds.), *Metaphor analysis: Research practice in applied linguistics, social sciences and the humanities*. London, England: Equinox.
- Derwojedowa, M., Linde-Usiekiewicz, J., & Zawisławska, M. (2010). Projekt RAMKI: Rygorystyczna aplikacja metodologii kognitywno-interpretacyjnej (ram interpretacyjnych) do opisu polszczyzny. In Zawisławska, M. (Ed.), *Ramki. Rygorystyczna aplikacja metodologii kognitywno-interpretacyjnej*. Warszawa: Elipsa.
- Dobaczewski, A. (2002). *Zjawiska percepcji wzrokowej: studium semantyczne*. Warszawa: UW. KLF.
- Dobrzyńska, T. (1984). *Metafora*. Wrocław/Warszawa/Kraków/Gdańsk/Łódź: Zakład Narodowy im. Ossolińskich.
- Dobrzyńska, T. (1994). *Mówiąc przenośnie... Studia o metaforze*. Warszawa: IBL.
- Dodge, E. K. (2018). A deep semantic corpus-based approach to metaphor analysis. In Petruck, M. R. L. (Ed.), *MetaNet*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 127–165.
- Duang, H., & Gao, L. (2014). Construction of sensory transfer model of gustatory and olfactory-synaesthetic metaphor (GO-STM) and English-Chinese comparative study. *Open Journal of Modern Linguistics* 4, 290–300.
- Dubisz, S. (Ed.). (2003). *Uniwersalny słownik języka polskiego*. Warszawa: Wydawnictwo Naukowe PWN.
- Dyzak, A. (1999). *Językowe wyrażenia zjawisk emisji światła*. Bydgoszcz: Wydaw. Uczelniane WSP.
- Dyzak, A. (2010). *Językowe wyrażenia zjawisk jasności i ciemności*. Bydgoszcz: Wydawnictwo Uniwersytetu Kazimierza Wielkiego.
- Eubanks, P. (1999). The story of conceptual metaphor: What motivates metaphoric mappings? *Poetics Today* 20, 419–442.
- Eubanks, P. (2000). *A war of words in the discourse of trade: The rhetorical constitution of metaphor*. SIU Press.
- Fass, D. 1991. met*: A method for discriminating. *Computational Linguistics* 17(1), 49–90.
- Fauconnier, G., & Turner M. (2002). *The way we think. Conceptual blendings and the mind's hidden complexities*. New York, NY: Basic Books.
- Fauconnier, G. & Turner, M., (2008). Rethinking Metaphor. In Gibbs Jr, R. (Ed.), *Cambridge Handbook of Metaphor and Thought*. New York: Cambridge University Press.

- Filar, D. (2013). *Narracyjne aspekty językowego obrazu świata. Interpretacja marzenia we współczesnej polszczyźnie*. Lublin: Wydawnictwo UMCS.
- Fillmore, C. J. (1968). *The case for case*. In Bach, E., & Harms, R. (Eds.), *Universals in linguistic theory*. New York, NY: Holt, Rinehart & Winston.
- Fillmore, C. J. (1977). Scenes-and-frames semantics. In Zampolli, A. (Ed.), *Linguistic structures processing*, number 59 in *Fundamental Studies in Computer Science*. Dordrecht: North Holland Publishing.
- Fillmore, C. J. (1982). Frame semantics. In *The Linguistics Society of Korea (Eds.), Linguistics in the morning calm*. Seoul: Hanshin Publishing Co., 111–137.
- Fillmore, C. J. (1985). Frames and the semantics of understanding. *Quaderni di Semantica* 6(2), 222–254.
- Fillmore, C. J., & Atkins, B. T. (1992). Toward a frame-based lexicon: The semantics of RISK and its neighbors. In *Frames, fields, and contrasts: New essays in semantic and lexical organization* 103, 75–102.
- Fludernik, M. (2009a). The cage metaphor: Extending narratology into corpus studies and opening it to the analysis of imagery. In Heinen, S., & Sommer, R. (Eds.), *Narratology in the age of cross-disciplinary narrative research (Vol. 20)*. Berlin, Germany: Walter de Gruyter, 109–128.
- Fludernik, M. (2009b). *An introduction to narratology*. New York, NY: Routledge.
- Forceville, C. (2016). Mixing in pictorial and multimodal metaphors? In Gibbs Jr, R. W. (Ed.), *Mixing metaphor*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 223–240.
- Frege, G. (1892). Über sinn und bedeutung. *Zeitschrift für Philosophie und philosophische Kritik* 100(1), 25–50.
- Gentner, D. (1982). Why nouns are learned before verbs: Linguistic relativity versus natural partitioning. In Kuczaj, S. (Ed.), *Language development 2: Language, thought and culture*. Hillsdale, NJ: Lawrence Erlbaum, 301–334.
- Gentner, D., & Boroditsky, L. (2001). Individuation, relational relativity and early word learning. In Bowerman, M., & Levinson, S. (Eds.), *Language acquisition and conceptual development*. Cambridge, England: Cambridge University Press, 215–256.
- Gentner, D., & Bowdle, B. (2008). Metaphor as structure-mapping. In Gibbs Jr, R. W. (Ed.), *The Cambridge handbook of metaphor and thought*. Cambridge, England: Cambridge University Press, 109–128.
- Gibbs Jr, R. W. (2003). Embodied experience and linguistic meaning. *Brain and Language* 84(1), 1–15.

- Gibbs Jr, R. W. (2005). *Embodiment and cognitive science*. Cambridge, England: Cambridge University Press.
- Gibbs Jr, R. W. (2011). The allegorical impulse. *Metaphor and Symbol* 26(2), 121–130.
- Gibbs Jr, R. W. (2015). The allegorical character of political metaphors in discourse. *Metaphor and the Social World* 5(2), 264–282.
- Gibbs Jr, R. W. (Ed.). (2016). *Mixing metaphor* (Vol. 6). Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company.
- Gibbs Jr, R. W. (2017). *Metaphor wars. Conceptual metaphors in human life*. Cambridge, England: Cambridge University Press.
- Gibbs Jr, R. W., & Cameron, L. (2008). The social-cognitive dynamics of metaphor performance. *Cognitive Systems Research* 9(1–2), 64–75.
- Gibbs Jr, R. W., & Lonergan, J. E. (2009). Studying metaphor in discourse: Some lessons, challenges and new data. In Musolff, A., & Zinken, J. (Eds.), *Metaphor and discourse*. London, England: Palgrave Macmillan, 251–261.
- Głowiński, M., Kostkiewiczowa, T., Okopień-Sławińska, A., & Sławiński, J. (1988). *Słownik terminów literackich*, Wrocław: Zakład Narodowy im. Ossolińskich.
- Glucksberg, S., & Keysar, B. (1993). How metaphor works. In Ortony, A. (Ed.), *Metaphor and thought*. Cambridge, England: Cambridge University Press, 401–424.
- Goatly, A. (1997). *The language of metaphors*. London, England/New York, NY: Routledge.
- Goatly, A. (2006). Ideology and metaphor. *English Today* 22(3), 25–39.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. London, England: Harper and Row.
- Górska, E. (2014). The up/down orientation in language and music. In Brenzinger, M., & Kraska-Szlenk, I. (Eds.), *The body in language: Comparative studies of linguistic embodiment*. Leiden, Netherlands/Boston, MA: Brill, 177–195.
- Grady, J. (1997). *Foundation of meaning. Primary metaphors and primary scenes* (PhD dissertation, UC Berkeley).
- Grady, J. (2005). Primary metaphors as inputs to conceptual integration. *Journal of Pragmatics* 37(10), 1595–1614.
- Grzegorzczkova, R. (2012). Określenia percepcji węchowej w języku polskim. In Grzegorzczkova, R., & Mikołajczuk, A. (Eds.), *Świat widziany poprzez słowa. Szkice z semantyki leksykalnej*. Warszawa: Wydawnictwa Uniwersytetu Warszawskiego, 160–168.

- Halliday, M. A. K. (1985). *An introduction to functional grammar*. London, England: Edward Arnold.
- Halliday, M. A. K. (1998). Things and relations: Reagrammaticising experience as technical knowledge. In Martin, J., & Veel, R. (Eds.), *Reading science*. London, England: Routledge, 185–235.
- Hardie, A. (2014). *Log ratio – An informal introduction*. Retrieved from <http://cass.lancs.ac.uk>, access date 20.01.2018.
- Hellmann, J. H., Thoben, D. F., & Echterhoff, G. (2013). The sweet taste of revenge: Gustatory experience induces metaphor-consistent judgments of a harmful act. *Social Cognition* 31(5), 531–542.
- Hellsten, I. (2002). *The politics of metaphor: Biotechnology and biodiversity in the media*. Tampere: Tampere University Press.
- Hidalgo-Downing, L., Martínez, M., & Kraljevic-Mujic, B. (2016). Multimodal metaphor, narrativity and creativity in TV cosmetic ads. In Romano, M., & Porto, M. D. (Eds.), *Exploring discourse strategies in social cognitive interaction* (Vol. 262). Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 137–158.
- Holz, P. (2007). Cognition, olfaction and linguistic creativity. Linguistic synesthesia as poetic device in cologne advertising. In Plümacher, M., & Holz, P. (Eds.), *Speaking of colors and odors*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing, 185–202.
- Hudson, R., & Distel, H. (2002). The individuality of odor perception. In Rouby, C., Schaal, B., Dubois, D., Gervais, R., & Holley, A. (Eds.), *Olfaction, taste, and cognition*. Cambridge, England: Cambridge University Press, 408–420.
- Jackendoff, R. (1983). *Semantics and cognition* (Vol. 8). Cambridge, MA/London, England: MIT Press.
- Jaensch, E. R. (1929). *Grundformen menschlichen Seins*. Berlin, Germany: O. Elsner Verlagsgesellschaft m.b.h.
- Jäkel, O. (2003). *Metafory w abstrakcyjnych domenach dyskursu. Kognitywistyczno-lingwistyczna analiza metaforycznych modeli aktywności umysłowej, gospodarki i nauki*. Kraków: Universitas.
- Jang, H., Maki, K., Hovy, E., & Rose, C. (2017). Finding structure in figurative language: Metaphor detection with topic-based frames. In Jokinen, K., Stede, M., De Vault, D., & Louis, A. (Eds.), *Proceedings of the 18th Annual SIGdial Meeting on Discourse and Dialogue*, August 2017. Saarbrücken, Germany: Association for Computational Linguistic, 320–330.
- Judycka, I. (1963). Synestezja w rozwoju znaczeniowym wyrazów. *Prace Filologiczne*. XVIII, 59–78.

- Karwoski, T. F., Odbert, H. S., & Osgood, C. E. (1942). Studies in synesthetic thinking: II. The role of form in visual responses to music. *The Journal of General Psychology* 26(2), 199–222.
- Kiklewicz, A. (2007). *Zrozumieć język. Szkice z filozofii języka, semantyki, lingwistyki komunikacyjnej*. Łask: Oficyna Wydawnicza LEKSEM.
- Kimmel, M. (2010). Why we mix metaphors (and mix them well): Discourse coherence, conceptual metaphor, and beyond. *Journal of Pragmatics* 42(1), 97–115.
- Kittay, E. F. (1987). *Metaphor: Its cognitive force and linguistic structure*. Oxford, England: Oxford University Press.
- Kittay, E. F., & Lehrer, A. (1981). Semantic fields and the structure of metaphor. *Studies in Language* 5(1), 31–63.
- Kładoczny, P. (2012). *Semantyka nazw dźwięków w języku polskim*. T.1–2. Łask: Oficyna Wydawnicza Leksem.
- Koller, V. (2004). Businesswoman and war metaphors: “possessive, jealous and pugnacious?” *Journal of Sociolinguistics* 8(1), 3–22.
- Korsmeyer, C. (1999). *Making sense of taste. Food and philosophy*. Ithaca, NY: Cornell University Press.
- Köster, E. (2002). The specific characteristics of the sense of smell. In Rouby, C., Schaal, B., Dubois, D., Gervais, R., & Holley, A. (Eds.), *Olfaction, taste, and cognition*. Cambridge, England: Cambridge University Press, 27–43.
- Kövecses, Z. (2016). A view of “mixed metaphors” within a conceptual metaphor theory framework. In Gibbs Jr, R. W. (Ed.), *Mixing metaphor*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 1–16.
- Krishnakumaran, S., & Zhu, X. (2007). Hunting elusive metaphors using lexical resources. In Feldman, A., & Lu, X. (Eds.), *Proceedings of the Workshop on Computational Approaches to Figurative Language*, Rochester, NY, April 2007. Rochester, NY: Association of Computational Linguistics, 13–20.
- Kubicka, D. (2005). Myślenie metaforyczne i jego uwarunkowania u dzieci w wieku od 4 do 10 lat. *Studia Psychologiczne* t. 43, z. 2, 59–73.
- Kunz, K. A. (2010). *Variation in English and German nominal coreference: A study of political essays*. Frankfurt am Main/Berlin, Germany/Bern, Switzerland/Bruxelles, Belgium/New York, NY/Oxford, England/Wien, Austria: Peter Lang.
- Lakoff, G. (1993). The contemporary theory of metaphor. In Ortony, A. (Ed.), *Metaphor and thought* (2nd ed.), Cambridge, England: Cambridge University Press, 202–251.

- Lakoff, G. (2006). Conceptual metaphor. The contemporary theory of metaphor. In Geeraerts, D. (Ed.), *Cognitive linguistics: Basic readings*. Berlin, Germany: Mouton de Gruyter.
- Lakoff, G. (2008). *The political mind: A cognitive scientist's guide to your brain and its politics*. New York, NY: Penguin.
- Lakoff, G. (2011 [1987]). *Kobiety, ogień i rzeczy niebezpieczne. Co kategorie mówią nam o umyśle*. Kraków: Universitas.
- Lakoff, G. (2012). Explaining embodied cognition results. *Topics in Cognitive Science* 4(4), 773–785.
- Lakoff, G. (2014). Mapping the brain's metaphor circuitry: Metaphorical thought in everyday reason. *Frontiers in Human Neuroscience* 8, 1–14. Retrieved from <https://www.frontiersin.org/articles/10.3389/fnhum.2014.00958/full>, access date 24.10.2017.
- Lakoff, G., & Johnson, M. (2008 [1980]). *Metaphors we live by*. Chicago, IL: University of Chicago Press.
- Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh*. New York, NY: Basic Books.
- Lakoff, G., & Narayan, S. (2010). Toward a computational model of narrative. In Finlayson, M. (Ed.), *AAAI Fall Symposium: Computational Models of Narrative, November 2010, Arlington, Virginia*. Menlo Park, California: AAAI Press, 21–28.
- Langacker, R. W. (1987). *Foundations of cognitive grammar: Theoretical prerequisites* (Vol. 1). Stanford, CA: Stanford University Press.
- Langacker, R. W. (1990). *Concept, image, and symbol: The cognitive basis of grammar*. Berlin, Germany/New York, NY: Mouton de Gruyter.
- Langacker, R. W. (1991). *Foundations of cognitive grammar* (Vol. 2), *Descriptive Application*. Stanford, CA: Stanford University Press.
- Langacker, R. W. (2010). Conceptualization, symbolization, and grammar. *International Journal of Cognitive Linguistics* 1(1), 31–63.
- Loneragan, J. E. and Gibbs Jr., R. W. (2016). Tackling mixed metaphors in discourse: New corpus and psychological evidence. In Gibbs Jr, R. W. (Ed.), *Mixing metaphor*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 57–71.
- Lundmark, C. (2005). *Metaphor and creativity in British magazine advertising*. Luleå: Luleå University of Technology.
- Ładziak, E. (2015). Dotykając powierzchni. Przymiotniki opisujące wrażenia odbierane przez zmysł dotyku. In Lipiński, D., & Witczak, K. T. *Badania diachroniczne w Polsce. Pamięci Profesora Witolda Stefańskiego (1953–2013)*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego, 153–165.

- Markowski, A. (1990). *Leksyka wspólna różnym odmianom polszczyzny* (Vol. 2). Warszawa: Wiedza o kulturze.
- Marks, L. E. (1982a). Synesthetic perception and poetic metaphor. *Journal of Experimental Psychology: Human Perception and Performance* 8(1), 15–23.
- Marks, L. E. (1982b). Bright sneezes and dark coughs, loud sunlight and soft moonlight. *Journal of Experimental Psychology: Human Perception and Performance* 8(2), 177–193.
- Marks, L. E. (1990). Synaesthesia: Perception and metaphor. In Burwick, F., & Pape, W. (Eds.), *Aesthetic illusion: Theoretical and historical approaches*. Berlin, Germany: Mouton de Gruyter, 28–40.
- Marks, L. E. (1996). On perceptual metaphors. *Metaphor and Symbolic Activity* 1(1), 36–96.
- Marks, L. E. (2011). Synesthesia, then and now. *Intellectica* 1(55), 47–80.
- Marks, L. E. (2017). Synesthesia, then and now. In Deroy, O. *Sensory blending. On synaesthesia and related phenomena*. Oxford, England: Oxford University Press, 13–44.
- Marks, L. E., Mulvenna, C. M. (2013). Synesthesia on our mind. *Theoria et Historia Scientiarum* vol. X, 13–35.
- Martens, G., & Biebuyck, B. (2013). Channelling figurativity through narrative: The paranarrative in fiction and non-fiction. *Language and Literature* 22(3), 249–262.
- Mihatsch, W. (2009). Nouns are things. In Panther, K. U., Thornburg L. L., & Barcelona, A. (Eds.), *Metonymy and metaphor in grammar*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 75–97.
- Mill, J. S. (1875). *A system of logic, ratiocinative and inductive: Being a connected view of the principles of evidence, and the methods of scientific investigation*, London, England: Longmans, Green, Reader, and Dyer.
- Minsky, M. (1974). *A framework for representing knowledge*. Cambridge: MIT A.I. Laboratory.
- Mitrenga, B. (2009). Nazwy zmysłu smaku w języku polskim. *LingVaria* 4(2), 227–236.
- Mitrenga, B. (2010). Intensyfikowanie doznań smakowych w polskiej leksyce i frazeologii. In Umińska-Tytoń, E. (Ed.), *Ilość – wielkość – wartość*. Łódź: Archidiecezjalne Wydawnictwo Łódzkie, 317–328.
- Mitrenga, B. (2011). Czasowniki percepcji smakowej w polszczyźnie historycznej i współczesnej. *Idea przemiany. Zagadnienia literatury, kultury, języka i edukacji*. T. 3. Częstochowa: Wydawnictwo WSL, 235–245.
- Mitrenga, B. (2014). *Zmysł smaku. Studium leksykalno-semantyczne*. Katowice: Wydawnictwo Uniwersytetu Śląskiego.

- Młodkowski, J. (1998). *Aktywność wizualna człowieka*. Warszawa: Wydawnictwo Naukowe PWN.
- Moore, K. E. (2006). Space-to-time mappings and temporal concepts. *Cognitive Linguistics* 17(2), 199–244.
- Moore, K. E. (2011). Ego-perspective and field-based frames of reference: Temporal meanings of FRONT in Japanese, Wolof, and Aymara. *Journal of Pragmatics* 43(3), 759–776.
- Müller, C. (2008). *Metaphors dead and alive, sleeping and waking: A dynamic view*. Chicago, IL: University of Chicago Press.
- Müller, C. (2016). Why mixed metaphors make sense. In Gibbs Jr, R. W. (Ed.), *Mixing metaphor*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 31–56.
- Müller, C. (2017). Waking metaphors: Embodied cognition in multimodal discourse. In Hempe, B. (Ed.), *Metaphor. Embodied cognition and discourse*. Cambridge, England: Cambridge University Press, 297–316.
- Musolf, A. (2004). *Metaphor and political discourse. Analogical reasoning in debates about Europe*. Basingstoke, England: Palgrave Macmillan.
- Musolf, A. (2006). Metaphor scenarios in public discourse. *Metaphor and Symbol* 21(1), 23–38.
- Nagórko, A. (1987). *Zagadnienia derywacji przymiotników*. Warszawa: Wydawnictwa UW.
- Najdecka, A. (2013). Innowacje semantyczne w nazwach kosmetyków. *Poradnik Językowy* 4, 75–86.
- Nerlich, B. (2011). The role of metaphor scenarios in disease management discourses: Foot and mouth disease and avian influenza. In Handl, S., & Schmid, H. J. (Eds.), *Windows to the mind: Metaphor, metonymy and conceptual blending*. Berlin, Germany/New York, NY: Walter de Gruyter, 115–142.
- Nerlich, B., & Clarke, D. D. (2000). Semantic fields and frames: Historical explorations of the interface between language, action, and cognition. *Journal of Pragmatics* 32(2), 125–150.
- Nerlich, B., Hamilton, C., & Rowe, V. (2002). Conceptualising foot and mouth disease: The socio-cultural role of metaphors, frames and narratives. *Metaphorik.de* 2(2002), 90–108.
- Niesporek-Szamburska, B. (2010). “Słowami też można dotykać” – o zmyśle dotyku w języku. *Slavica* 39/40, s. 52–65.
- Nünning, A. (2009). Steps towards a metaphorology (and narratology) of crises: On the functions of metaphors as figurative knowledge and mininarrations. *Real-Yearbook of Research in English and American Literature* 25, 229–262.

- O'Callaghan, C. (2017). Grades of multisensory awareness. *Mind & Language* 32(2), 155–181.
- Ogrodniczuk, M., Głowińska, K., Kopeć, M., Savary, A., & Zawisławska, M. (2015). *Coreference in Polish: Annotation, resolution and evaluation*. Berlin, Germany: Walter de Gruyter.
- Oswald, S., & Rihs, A. (2014). Metaphor as argument: Rhetorical and epistemic advantages of extended metaphors. *Argumentation* 28(2), 133–159.
- Padučeva, E.V. (1992). *Wypowiedź i jej odniesienie do rzeczywistości. (Referencyjne aspekty znaczenia zaimków)*. Warszawa: PWN.
- Pajdzińska, A. (1996). Wrażenia zmysłowe jako podstawa metafor językowych. *Etnolingwistyka. Problemy języka i kultury* 8. Lublin.
- Paradis, C., & Hommerberg, C. (2016). We drink with our eyes first: The web of sensory perceptions, aesthetic experiences and mixed imagery in wine reviews. In Gibbs Jr, R. W. (Ed.), *Mixing metaphor*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 179–202.
- Pawelec, A. (2005). *Znaczenie ucieleśnione. Propozycje kręgu Lakoffa*. Kraków: Universitas.
- Pawelec, A. (2006a). *Metafora pojęciowa a tradycja*. Kraków: Universitas.
- Pawelec, A. (2006b). The death of metaphor. *Studia Linguistica UJ* 123, 117–121.
- Petersen, W., Fleischhauer, J., Bücken, P., & Beşeoğlu, H. (2008). A frame-based analysis of synaesthetic metaphors. *The Baltic International Yearbook of Cognition, Logic and Communication* 3(1), 1–22.
- Pęzik, P. (2012) Wyszukiwarka PELCRA dla danych NKJP. In Przepiórkowski A., Bańko M., Górski R., Lewandowska-Tomaszczyk B (Eds.), *Narodowy Korpus Języka Polskiego*. Warszawa: Wydawnictwo PWN.
- Pęzik, P. (2013). Paradymat dystrybucyjny w badaniach frazeologicznych. Powtarzalność, reprodukcja i idiomatyzacja. In Stalmaszczyk, P. (Ed.), *Metodologie Językoznawstwa. Ewolucja Języka, Ewolucja Teorii Językoznawczych*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego.
- Pisarkowa, K. (1972). Szkic pola semantycznego zapachów w polszczyźnie. *Język polski LII*(5), 330–339.
- Pisarkowa, K. (1975). Der Tastsinn im Polnischen. *Biuletyn PTJ XXXIII*, 125–137.
- Popova, Y. (2005). Image schemas and verbal synaesthesia. In Hampe, B. and Grady, J. E. (Eds.), *From perception to meaning. Image schemas in cognitive linguistics*. Berlin, Germany: Mouton de Gruyter, 1–26.

- Pragglejaz Group. (2007). MIP: A method for identifying metaphorically used words in discourse. *Metaphor and Symbol* 22(1), 1–39.
- Prandi, M. (2012). A plea for living metaphors: Conflictual metaphors and metaphorical swarms. *Metaphor and Symbol* 27(2), 148–170.
- Prandi, M. (2017). *Conceptual conflicts in metaphor and figurative language*. New York, NY/London, England: Routledge.
- Prochowicz, A. (2013). Jak mówimy o śpiewaniu? Metafory synestezyjne jako element językowego obrazu śpiewu ludzkiego w polszczyźnie. *Linguarum Silva* 2, 55–70.
- Przepiórkowski, A., Bańko, M., Górski, R. L., & Lewandowska-Tomaszczyk, B. (Eds.). (2012). *Narodowy Korpus Języka Polskiego*. Warszawa: Wydawnictwo Naukowe PWN.
- R Core Team (2012). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Vienna, Austria. Retrieved from <http://www.R-project.org/>
- Ramachandran, V. S., & Hubbard, E. M. (2001a). Psychophysical investigations into the neural basis of synesthesia. *Proceedings of the Royal Society of London, Biological Sciences* 268, 979–983.
- Ramachandran, V. S., & Hubbard, E. M. (2001b). Synesthesia: A window into perception, thought, and language. *Journal of Consciousness Studies* 8(1), 3–34.
- Ramachandran, V. S., & Hubbard, E. M. (2003). The phenomenology of synesthesia. *Journal of Consciousness Studies* 10(8), 49–57.
- Rayson, P., & Garside, R. (2000). Comparing corpora using frequency profiling. In *Proceedings of the Workshop on Comparing Corpora, Held in Conjunction with the 38th Annual Meeting of the Association for Computational Linguistics (ACL 2000)*. October 1–8, 2000, Hong Kong. Hong Kong: Hong Kong University of Science and Technology, 1–6.
- Richards, I. (1936). *The philosophy of Rhetoric*. New York, NY/London, England: Oxford University Press.
- Ritchie, L. D. (2006). *Context and connection in metaphor*. New York, NY: Palgrave Macmillan.
- Ritchie, L. D. (2010). “Everybody goes down”: Metaphors, stories, and simulations in conversations. *Metaphor and Symbol* 25(3), 123–143.
- Ritchie, L. D. (2011). “Justice is blind”: A model for analyzing metaphor transformations and narratives in actual discourse. *Metaphor and the Social World* 1, 70–89.
- Ritchie, L. D. (2017a). Story simulation in metaphor comprehension. Metaphor. In Hampe, B. (Ed.), *Embodied cognition and discourse*. Cambridge, England: Cambridge University Press, 220–238.

- Ritchie, L. D. (2017b). *Metaphorical stories in discourse*. Cambridge, England: Cambridge University Press.
- Ritchie, L. D. and Zhu, M. (2015) Nixon stonewalled the investigation: Potential contributions of grammatical metaphor to conceptual metaphor theory and analysis. *Metaphor and Symbol* 30(2), 118–136.
- Rogowska, A. (2007). *Synestezja*. Opole: Oficyna Wydawnicza.
- Ronga, I. (2016). Taste synaesthesias: Linguistic features and neurophysiological bases. In Gola, E., & Ervas, F. (Eds.), *Metaphor and communication* (pp. 47–60). Amsterdam, Netherlands: Benjamins Publishing.
- Rosińska, A. (2005). Rola synestezji w obrazowaniu zapachu. *Studia Filologiczne Akademii Świętokrzyskiej* 18, 65–77.
- Ruppenhofer, J., Ellsworth, M., Petruck, M. R. L., Johnson, C. R., Baker, C. F., & Scheffczyk, J. (2016). *FrameNet II: Extended theory and practice*. Berkeley, CA: International Computer Science Institute. Retrieved from <https://framenet2.icsi.berkeley.edu/docs/r1.7/book.pdf>, access date 10.03.2016.
- Russell, B. (1905). On denoting. Reprinted in Marsh, RC (Ed.). (1956). *Bertrand Russell. Logic and knowledge. Essays 1901–1950* (pp. 39–56).
- Schank, R. C., & Abelson, R. P. (1975). Scripts, plans, and knowledge. *Papers presented at the 4th International Joint Conference on Artificial Intelligence*, Tbilisi, USSR, 151–157.
- Schank, R. C., & Abelson, R. P. (1977). *Scripts, plans, goals, and understanding: An inquiry into human knowledge structures*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Schank, R. C., & Abelson, R. P. (1995). Knowledge and memory: The real story. In Wyer, R. S. (Ed.), *Knowledge and memory: The real story*. Hillsdale, NY: Lawrence Erlbaum Associates, 1–85.
- Searle, J. R. (1993). Metaphor. In Ortony, A. (Ed.), *Metaphor and thought*. Cambridge, England: Cambridge University Press, 83–111.
- Sedivy, S. (1997). Metaphors picture, pulsars, platypuses. *Metaphor and Symbol* 12(2): 95–112.
- Semino, E. (2008). *Metaphor in discourse*. Cambridge, England: Cambridge University Press.
- Semino, E. (2016). A corpus-based study of ‘mixed metaphors’ as a metalinguistic comment. In Gibbs Jr, R. W. (Ed.), *Mixing metaphor*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 203–222.
- Semino, E., Demjén, Z., & Demmen, J. (2018). An integrated approach to metaphor and framing in cognition, discourse, and practice, with an application to metaphors for cancer. *Applied Linguistics* 39(5), 625–645.

- Shen, Y. (1997). Cognitive constraints on poetic figures. *Cognitive Linguistics* 8, 33–71.
- Shen, Y., & Cohen, M. (1998). How come silence is sweet but sweetness is not silent: A cognitive account of directionality in poetic synaesthesia. *Language and Literature* 7, 123–140.
- Shutova, E., Lin, S., & Korhonen, A. (2010). Metaphor identification using verb and noun clustering. In Huang, C. & Jurafsky, D. (Eds.), *Proceedings of the 23rd International Conference on Computational Linguistics (Coling 2010)*. Beijing.
- Skolik, A. (2011). *Smak w analizie sensorycznej*. Poznań: Wydawnictwo UEP.
- Skorczynska H., & Deignan, A. (2006). Readership and purpose in the choice of economics metaphors. *Metaphor and Symbol* 21(2), 87–104.
- Smith, B. (2015). The chemical senses. In Matthen, M. (Ed.), *The Oxford handbook of philosophy of perception*. Oxford, England: Oxford University Press, 314–352.
- Snævarr, S. (2010). *Metaphors, narratives, emotions: Their interplay and impact*. Amsterdam, Netherlands: Rodopi.
- Soskice, J. (1985). *Metaphor and religious language*. Oxford, England: Oxford University Press.
- Sperber, D., & Wilson, D. (2008). A deflationary account of metaphors. In Gibbs Jr, R. W. (Ed.), *The Cambridge handbook of metaphor and thought*. Cambridge, England: Cambridge University Press, 84–105.
- Steen, G. (2008). The paradox of metaphor: Why we need a three-dimensional model of metaphor. *Metaphor and Symbol* 23(4), 213–241.
- Steen, G. J., Dorst, A. G., Herrmann, J. B., Kaal, A., Krennmayr, T., & Pasma, T. (2010). *A method for linguistic metaphor identification. From MIP to MIPVU*. Amsterdam, Netherlands: John Benjamins.
- Stefanowitsch, A. (2006). Words and their metaphors: A corpus-based approach. In Stefanowitsch, A., & Gries, S. T. (Eds.), *Corpus-based approaches to metaphor and metonymy*. Berlin: Mouton de Gruyter, 63–105.
- Stefanowitsch, A. & Gries, S. T. (Eds.). (2006). *Corpus-based approaches to metaphor and metonymy*. Berlin, Germany: Mouton de Gruyter.
- Stevenson, R. J. (2009). *The psychology of flavour*. New York, NY: Oxford University Press.
- Stickles, E., David, O., & Sweetser, E. (2016). Grammatical constructions, frame structure, and metonymy: Their contributions to metaphor computation. In Healey, A., de Souza, R. N., Peškov, P., & Allen, M. (Eds.), *Proceedings of the 11th Meeting of the High Desert Linguistics Society*. Albuquerque, NM: High Desert Linguistics Society, 317–345.

- Stickles, E., David, O., Dodge, E. K., & Hong, J. (2016). Formalizing contemporary conceptual metaphor theory. *Constructions and frames* 8(2), 166–213.
- Strack, D. C. (2016) Solving metaphor theory's binding problem: An examination of "mapping" and its theoretical implications. *Metaphor and Symbol* 31(1), 1–10.
- Strik Lievers, F. S. (2015). Synaesthesia: A corpus-based study of cross-modal directionality. *Functions of language* 22(1), 69–95.
- Strik Lievers, F. S. (2017). Figures and the senses. *Review of Cognitive Linguistics* 15(1), 83–101.
- Strik Lievers, F. S., & Huang, C. R. (2016). A lexicon of perception for the identification of synaesthetic metaphors in corpora. In *Tenth International Conference on Language Resources and Evaluation (LREC 2016)*, 23–28 May 2016. Portorož, Slovenia, 4032–4036.
- Suárez-Toste, E. (2013). One man's cheese is another man's music: Synaesthesia and the bridging of cultural differences in the language of sensory perception. In Caballero, R. & Díaz-Vera, J. (Eds.), *Sensuous cognitio*. Berlin, Germany/New York, NY: Mouton de Gruyter, 169–191.
- Suárez-Toste, E. (2017). Babel of the senses. *Terminology. International Journal of Theoretical and Applied Issues in Specialized Communication* 23(1), 89–112.
- Sullivan, K. (2006). Frame-based constraints on lexical choice in metaphor. *Annual Meeting of the Berkeley Linguistics Society* 32(1), 387–399.
- Sullivan, K. (2013). *Frames and constructions in metaphoric language*. Amsterdam, Netherlands: John Benjamins Publishing.
- Sullivan, K. (2018). Integrating constructional semantics and conceptual metaphor. In Petruck, M. R. L. (Ed.), *MetaNet*. Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 11–35.
- Sullivan, K. (2019). *Mixed metaphors. Their use and abuse*. London: Bloomsbury.
- Szwedek, A. (2000). The ontology of metaphors: The sense of touch in language formation. *Scripta Periodica*, 4, 193–199.
- Szwedek, A. (2011). The ultimate source domain. *Review of Cognitive Linguistics* 9(2), 341–366.
- Szwedek, A. (2012). More evidence on the primacy of the noun over the verb. A cognitive explanation. In Wąsik, Z., & Chruszczewski, P. (Eds.), *Languages in contact 2011*. Wrocław: Wydawnictwo Wyższej Szkoły Filologicznej we Wrocławiu, 213–223.
- Szwedek, A. (2014). The nature of domains and the relationships between them in metaphorization. *Review of Cognitive Linguistics* 12(2), 342–374.

- Szwedek, A. (2017). Pierwotna podstawa doświadczeniowa metaforyzacji. *Tertium Linguistic Journal* 2(1), 1–13.
- Szymczak, M. (Ed.). (1978–1981). *Słownik języka polskiego*, vol. 1–3, Warszawa: Państwowe Wydawnictwo Naukowe.
- Tannen, D. (1993). What's in the frame? Surface evidence for underlying expectations. In Tannen, D. (Ed.), *Framing in discourse*. New York, NY: Oxford University Press, 14–43.
- Termińska, K. (1992). Metafora synestezyjna. *Poradnik Językowy* 3, 201–207.
- Tirrell, L. (1989). Extending: The structure of metaphor. *Noûs* 23(1), 17–34.
- Todorov, T. (2011). *Teorie symbolu*. Gdańsk: słowo/obraz terytoria.
- Tokarski, R. (2004). *Semantyka barw we współczesnej polszczyźnie*. Lublin: Wydaw. Uniwersytetu Marii Curie-Skłodowskiej.
- Tolstaja, S. M. (Ed.). (2017). *Antropocentrizm w języku i kulturze*. Moskwa: Indrik, Biblioteka Instytutu Slavjanovedenija RAN.
- Topolińska, Z. (1984). Składnia grupy imiennej. In Grochowski, M., Karolak, S., & Topolińska, Z. (Eds.), *Składnia. Gramatyka współczesnego języka polskiego*. Warszawa: PWN, 301–389.
- Toporov, V. N. (2015). Znak i tekst v prostranstve i vremeni, *Slavica Revalensia* t. 2, 139–167.
- Tsur, R. (1992). *Toward a theory of cognitive poetics*. Amsterdam, Netherlands: Elsevier.
- Tsur, R. (2007). Some comments on the Lakoffean conception of spatial imagery. *Theoria et Historia Scientiarum* 6(1), 245–267.
- Tyler, A., & Evans, V. (2001). The relation between experience, conceptual structure and meaning: Non-temporal uses of tense and language teaching. In Pütz, M., Niemeyer, S., & Driven, R. (Eds.), *Applied linguistics I: Theory and language acquisition*. Berlin, Germany: Mouton de Gruyter, 63–105.
- Ullman, S. (1945). Romanticism and synaesthesia: A comparative study of sense transfer in Byron and Keats. *Publication of the Modern Language Association of America* 60, 811–827.
- Ullmann, S. (1957). *The principles of semantics*. Blackwell, Oxford.
- Velasco-Sacristán, M., & Fuertes-Olivera, P. A. (2006). Olfactory and olfactory-mixed metaphors in print ads of perfume. *Annual Review of Cognitive Linguistics* 4(1), 217–252.
- Viberg, Å. (1984). The verbs of perception: A typological study. *Linguistics* 21(1), 123–162.
- Viberg, Å. (1993). Crosslinguistic perspectives on lexical organization and lexical progression. In Hyltenstam, K., & Viberg, Å. (Eds.), *Progression*

- and regression in language: Sociocultural, neuropsychological and linguistic perspectives.* Cambridge, England: Cambridge University Press, 340–385.
- Walsh, V. (2000). Neuropsychology: The touchy, feely side of vision. *Current Biology*, 10(1), R34–R35.
- Werning, M., Fleischhauer, J., & Beşeoğlu, H. (2006). The cognitive accessibility of synaesthetic metaphors. In Sun, R., & Miyake, N. (Eds.), *Proceedings of the Twenty-eighth Annual Conference of the Cognitive Science Society*. London, England: Lawrence Erlbaum Associates, 2365–2370.
- Werth, P. (1994). Extended metaphor—A text-world account. *Language and literature* 3(2), 79–103.
- Werth, P. (1999). *Text worlds: Representing conceptual space in discourse*. London, England: Longman.
- White, R. M. (1996). *The structure of metaphor. The way the language of metaphor works*. Oxford, England: Blackwell.
- Wiben Jensen, T. (2017). Doing Metaphor: An Ecological Perspective on Metaphoricity in Discourse. In Hampe, B. (Ed.), *Metaphor. Embodied cognition and discourse*. Cambridge, England: Cambridge University Press, 257–276.
- Wiben Jensen, T., & Cuffari, E. (2014) Doubleness in experience: Toward a distributed enactive approach to metaphoricity. *Metaphor and Symbol* 29(4), 278–297.
- Wierzbicka, A. (1971). Porównanie – gradacja – metafora. *Pamiętnik Literacki* LXII, Z.4, 126–147.
- Williams, J. M. (1976). Synaesthetic adjectives: A possible law of semantic change. *Language* 52, 461–478.
- Winter, B. (2016a). Taste and smell words form an affectively loaded and emotionally flexible part of the English lexicon. *Language, Cognition and Neuroscience* 31(8), 975–988.
- Winter, B. (2016b). *The sensory structure of the English lexicon* (Doctoral dissertation, UC Merced).
- Winter, B. (2019). Synaesthetic metaphors are neither synaesthetic nor metaphorical. In Speed, L. J., O'Meara, C., San Roque, L., & Majid, A. (Eds.), *Perception metaphors* (Vol. 19). Amsterdam, Netherlands/Philadelphia, PA: John Benjamins Publishing Company, 105–126.
- Witucka, M. (1998). Jak opisuje się zapachy w reklamie perfum. *Poradnik Językowy* 3, 1–8.
- Wróblewski, P. (1998). *Struktura, typologia i frekwencja polskich metafor*. Białystok: Wydawnictwo Uniwersytetu w Białymstoku.

- Yu, N. (2003). Synesthetic metaphor: A cognitive perspective. *Journal of Literary Semantics* 32, 19–34.
- Yu, X. (2015). The cognitive function of synesthetic metaphor. *Journal of Language Teaching and Research* 6(6), 1305–1310.
- Zawisławska, M. (2004). *Czasowniki oznaczające percepcję wzrokową we współczesnej polszczyźnie: ujęcie kognitywne*. Warszawa: Wydział Polonistyki Uniwersytetu Warszawskiego.
- Zawisławska, M. (2010). Ramy interpretacyjne jako narzędzie opisu znaczenia. In Zawisławska, M. (Ed.), *Ramki. Rygorystyczna aplikacja metodologii kognitywno-interpretacyjnej*. Warszawa: Elipsa.
- Zawisławska, M. (2011). *Metafora w języku nauki: na przykładzie nauk przyrodniczych*. Warszawa: Wydział Polonistyki Uniwersytetu Warszawskiego.
- Zawisławska, M. (2015). Funkcja metafory w rekonstrukcji językowego obrazu świata na przykładzie metaforyki w języku winiarzy. *Poradnik Językowy* 1, 79–88.
- Zawisławska, M. (2015). Reference, anaphora, coreference. In Ogrodniczuk, M., Głowińska, K., Kopeć, M., Savary, A., & Zawisławska, M. Coreference in Polish: Annotation, resolution and evaluation. Berlin, Germany: Walter de Gruyter, 3–22.
- Zawisławska, M., & Falkowska, M. (2017). Typology of metaphors with the gustatory target domain in Polish wine discourse. *Crossroads. A Journal of English Studies* 17(2), 76–90.
- Zeileis, A., Meyer, D., & Hornik, K. (2007). Residual-based shadings for visualizing (conditional) independence. *Journal of Computational and Graphical Statistics* 16(3), 507–525.
- Zielińska K. (2011). *Obiekt w (semantycznym) polu widzenia: analiza kontrastywna czasowników percepcji wzrokowej w języku polskim i niemieckim*. Warszawa: Uniwersytet Warszawski. Instytut Germanistyki. Wydział Neofilologii.
- Ziem, A. (2014). *Frames of understanding in text and discourse: Theoretical foundations and descriptive applications*. Amsterdam, Netherlands/ Philadelphia, PA: John Benjamins Publishing Company.
- Zinken, J., Hellsten, I., & Nerlich, B. (2008). Discourse metaphors. In R. Dirven, R. Frank, T. Ziemke & J. Zlatev (Eds.), *Body, language, and mind*. Vol. 2: *Sociocultural Situatedness*. Berlin: Mouton, 363–385.
- Żmigrodzki, P. (Ed.). (2007). *Wielki słownik języka polskiego PAN*. Instytut Języka Polskiego PAN, Kraków. Retrieved from <http://wsjp.pl/>.
- Żurowski, S. (2012). *Wyrażenia percepcji słuchowej w języku polskim: analiza semantyczna*. Toruń: Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika.

Index

A

activator 40, 42, 44, 43–44, 46–49,
51, 58, 111–118, 120, 122, 124–130,
132, 134, 136, 138, 143, 148, 154,
173, 175

allegory 146, 152, 182

Autonomy-Dependence

Constraint 124, 129

C

cascade 54, 155, 182

conceptual domain 11–15, 19, 24,
106, 124, 125, 147, 166, 170

Conceptual Metaphor Theory 9, 11,
13, 14, 34, 182, 187, 193, 195

corpuses of metaphors 35, 49, 57, 58

E

elaborated metaphors 142, 143, 169

embodiment 91, 102, 103, 106, 108,
156, 157, 168, 185

entangled metaphor 50, 51, 55, 142,
154–156

evaluative function of
metaphor 167, 171

extended metaphor 146, 147, 152,
180, 182, 191, 197

F

frame

– definition 17, 21, 24

– non-perceptual 31, 41, 63, 65,
74–85, 87, 89, 91, 92, 94, 97, 102,
111–113, 116, 120, 123–125, 169,
173, 174, 176, 177

– perceptual 28, 31, 37, 47, 63–65,
67–69, 73–85, 98, 111–115, 125,
127, 129, 169, 173, 174, 176, 177

frame semantics 9, 11, 13, 15–23,
25, 31, 91, 93, 95, 97, 99, 101, 103,
105, 107, 109, 155, 184

FrameNet 15, 17, 19–24, 63–65,
111, 113, 177, 193

H

hypallage 51, 142, 154, 155

I

Invariance Principle 12, 15, 108

L

layered metaphor 158

M

mapping 11–15, 18, 19, 24, 28, 34,
63, 91, 98, 102, 108, 110, 136, 138,
141–143, 150, 152, 154–157, 163,
166, 167, 169, 170, 177, 182–184,
188, 190, 195

MetaNet 15, 17, 19, 23–25, 182,
183, 195

metaphor identification

procedure 9, 33–35, 37

metaphorical story 53, 147, 161, 169

metonymy 9, 57, 179, 189, 190, 194

micronarrative 145

mixed metaphor 49, 50, 55, 141,
142, 152–155, 169, 179, 187, 188,
190, 193, 195, 196

model of verbal synesthesia

– Ullman's model 9, 25, 28–30, 63,
96, 98–101, 169

– Viberg's model 9, 25, 30, 63, 96,
99, 101, 169

– Williams' model 9, 25, 28, 29, 63,
96, 101, 169, 173

N

narrative metaphor 50, 53–55,
141–152, 158, 177

O

objectification 125

P

perception

- hearing 30, 39, 47, 50, 64, 65,
67–74, 78, 81, 83–86, 93, 96–99,
103–106, 108, 114, 115, 118, 120,
124, 156, 176, 177
- multimodal 39, 47, 50, 65, 67–72,
74, 78, 79, 81–87, 99, 100, 103,
105, 114, 115, 118, 120, 124–126,
129, 153, 156, 176, 177, 186
- smell 20, 23, 28–31, 39, 45, 47,
63–65, 67–74, 78, 81, 82, 87, 93,
96, 98, 99, 103–108, 114, 115, 118,
120, 124, 125, 129, 145, 151, 152,
176, 177, 180, 197
- taste 20, 28–31, 37, 45, 50, 63–65,
67–74, 78, 79, 81, 83, 84, 87, 88,
93, 96, 98–100, 103–107, 114, 115,
118, 120, 124, 156, 176, 177, 182,
186, 197
- touch 25, 28–30, 50, 63–74, 78,
81–83, 85, 87, 88, 93, 96, 98–100,
103–105, 114, 115, 118, 120,
124–126, 129, 152, 176, 177,
195, 197
- vision 28, 30, 47, 50, 65, 67–74,
78, 81–85, 90, 98–100, 103, 104,
107, 114, 115, 118, 120, 124–126,
129, 156, 176, 177, 197

perceptual synesthesia 26, 27

personification 58, 106, 163, 169

R

reference 23, 36–39, 63, 64, 147,
190, 198

referent 22, 33, 36–40, 43, 48, 50,
58, 64, 97, 147, 148, 154, 165
reification 106, 127

S

scenario 17, 146, 147, 158, 190
scene 17, 20, 21, 24, 127, 146, 167,
184, 185
senses higher and lower 28, 30, 96,
98, 139
simile 11, 148
situationally triggered
metaphor 158
storied metaphor 146
strong synesthetic metaphor 31, 41,
68, 69, 81, 82, 98, 99, 102,
103, 106–108, 110, 123, 169,
173, 175

T

tools for annotation
– ATOS 33, 40–42, 44, 46–52,
54, 173
– DISTSYS 39, 40
– SPEJD 39
topic 11, 30, 33, 36–41, 43–45,
47, 50, 53, 58, 94, 101, 129,
145–148, 150, 155, 158, 173, 175,
186, 188
topic-triggered metaphor 158
typical metaphors 50, 55, 121,
141–143, 155

V

verbal (linguistic) synesthesia 9,
25–27, 30, 96, 103, 105

W

weak synesthetic metaphor 31,
33, 41, 74, 75, 79, 81, 82, 102,
103, 106, 108, 110, 157, 175

Studies in Philosophy of Language and Linguistics

Edited by Piotr Stalmaszczyk

- Vol. 1 Piotr Stalmaszczyk / Luis Fernández Moreno (eds.): *Philosophical Approaches to Proper Names*. 2016.
- Vol. 2 Piotr Stalmaszczyk (ed.): *Philosophical and Linguistic Analyses of Reference*. 2016.
- Vol. 3 Martin Hinton (ed.): *Evidence, Experiment and Argument in Linguistics and the Philosophy of Language*. 2016.
- Vol. 4 Piotr Stalmaszczyk (ed.): *From Philosophy of Fiction to Cognitive Poetics*. 2016.
- Vol. 5 Luis Fernández Moreno: *The Reference of Natural Kind Terms*. 2016.
- Vol. 6 Szymon J. Napierała: *Symmetry Breaking and Symmetry Restoration. Evidence from English Syntax of Coordination*. 2017.
- Vol. 7 Piotr Stalmaszczyk (ed.): *Philosophy and Logic of Predication*. 2017.
- Vol. 8 Jarosław Jakielaszek: *A Minimalist View on the Syntax-Semantics Relationship. Turning the Mind into a Snowflake*. 2017.
- Vol. 9 Piotr Stalmaszczyk (ed.): *Understanding Predication*. 2017.
- Vol. 10 Aleksandra Majdzińska: *"The Same, but Different". A Cognitive Linguistic Approach to Variantivity*. 2018.
- Vol. 11 Veronica O'Neill: *Translating Translation. Walter Benjamin on the Way to Language*. 2018.
- Vol. 12 Piotr Stalmaszczyk (ed.): *Objects of Inquiry in Philosophy of Language and Linguistics*. 2018.
- Vol. 13 Kacper Bartczak, Jakub Mácha (eds.): *Wallace Stevens: Poetry, Philosophy, and Figurative Language*. 2018.
- Vol. 14 Magdalena Zawistawska: *Metaphor and Senses. The Synamet Corpus: A Polish Resource for Synesthetic Metaphors*. 2019.

www.peterlang.com

