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WHAT DO METAPHORS OF UNDERSTANDING HIDE?

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Abstract

Many previous studies on the conceptual function of metaphors have focused on their function of highlighting aspects of target concepts. From the beginning of this research, it was known that conceptual metaphors also hide aspects of the target concept; however, this aspect has been less studied. This study builds upon the idea that the hiding aspect of a specific metaphor should be identified in relation to other metaphors for the same concept. A method is presented to detail this relation based on the theory of semantic frames and the FrameNet resource to identify the hidden aspects and apply it to a corpus of 298 elicited metaphor texts on the target concept of understanding. The analysis revealed that certain conceptual aspects are consistently hidden by a majority of metaphors, pointing to patterns in conceptualization. Using this approach, six aspects frequently hidden by metaphors were identified: Sociality, Transfer, Ownership, Perception, Foundation and Duration.
Keywords: conceptual metaphor, hiding, highlighting, frame semantics, understanding.

1 Introduction

Is understanding seeing a light, a process of transmission, a journey traveled, or a building erected? These metaphors do more than decorate lan-

guage – they offer an insight into human cognition, they show how individuals conceptualize or *understand* understanding (Lakoff & Johnson, 1980). They do so by highlighting certain aspects of the target concept, for instance the subjective clarity that goes along with understanding or the fact that others may facilitate understanding. This highlighting of some aspects goes along with the hiding of other aspects. Hiding might be helpful if it draws attention away from aspects that are of little relevance for understanding a target concept. However, it may also be problematic if important aspects of a target concept are hidden. In this paper, a structured method of analyzing hidden aspects of metaphors by using frame semantics is presented, and applied to a corpus of metaphors on understanding.

The following example is analyzed in detail. One metaphor for understanding is *gaining*, as in "our understanding is constantly changing as we *gain* new information and insights." According to the *Macmillan English Dictionary for Advanced Learners*, *gaining* means to "get or achieve something, usually a result of a lot of effort." This metaphor thus highlights that understanding is an intentional activity that needs effort. (Using a dictionary to identify the basic meaning of a metaphorically used word is a method that has been recommended by Steen et al. (2010); this method will be revisited later.)

Following the implications or entailments of the metaphor a bit further, *getting* and *achieving* imply a short action. *Gaining* can furthermore be interpreted as goal-directed and intentional (which would be in line with the mentioned effort and the achieving), but it also can occur partly incidentally (you can get things without intending to). It implies a rather fixed entity or fixed entities (something that one can own) as the object of understanding, and this object seems to preexist the action.

The conceptual frame of GETTING[1] can be defined as follows:

> "A RECIPIENT starts off without the THEME in their possession, and then comes to possess it. Although the SOURCE from which the THEME came is logically necessary, the RECIPIENT and its changing relationship to the THEME is profiled" (https://framenet.icsi.berkeley.edu/fnReports/data/frameIndex.xml?frame=Getting)

The core elements of the GETTING frame – conceptual structures of types of events, relations, entities, and their participants that can be used for semantic descriptions (Ruppenhofer et al., 2010) – are the RECIPIENT and the THEME. (This description stems from frame semantics, a theory of meaning; more will follow below.) But what does this metaphor hide?

In principle, an infinite number of possible properties of understanding are *not* emphasized by a specific metaphor. Many of these would be irrelevant to the understanding of understanding. In this case, it is advisable not

[1] In the following text, conceptual structures, including conceptual metaphors, domains, frames along their associated frame elements, are written in small capitals.

to speak of hiding. It is argued that an element should be identified as hidden only if this property concerns a central element of the target concept that disagrees with the metaphor or if it is clearly emphasized in other metaphors for the same target concept. Thus, to elaborate the properties hidden by a metaphor, an overview of the set of metaphors used for it or a definition and description of the target concept are needed. The first of these possibilities will be addressed in the following sections.

Preliminarily, the necessity or relevance of hiding some elements may arise from the context of a particular discourse. This may arise if a dialogue participant misunderstands a metaphorically explained issue. This constitutes an interesting case for metaphor research. However, the present study focuses exclusively on the conceptual aspect; the rhetorical or discourse aspect, as well as the linguistic one, will have to complement this at a later stage of research (see Steen, 2008, 2011).

To analyze which aspects are highlighted or hidden, this study draws on Lakoff and Johnson's *Conceptual Metaphor Theory* (1980). *Conceptual metaphors* are defined as "understanding and experiencing one conceptual domain in terms of another conceptual domain" (Kövecses, 2002, p. 4). They consist of a more concrete source domain whose elements are mapped onto an abstract target domain. An example for the conceptual metaphor UNDERSTANDING IS SEEING is "I *see* what you're saying. It *looks* different from my *point of view*" (Lakoff & Johnson, 1980, p. 48).

As already mentioned above, Lakoff and Johnson (1980, pp. 10–13) reasoned that metaphors highlight, but also hide aspects of the target to which they are applied. Through *highlighting*, metaphors focus attention on certain aspects of the issue in question, put them into the foreground, and thereby influence understanding and action. They simultaneously also *hide* some aspects of the target because the systematic mapping is necessarily partial (Lakoff & Johnson, 1980, p. 10). Aspects of source domains that are mapped onto the target domain are highlighted, while non-mapped aspects of source domains are hidden (Kövecses, 2002). That hiding is an unavoidable consequence of highlighting is often, but not necessarily, a bad thing, because the selective highlighting and hiding inherent in metaphors can promote misunderstanding at times (Taylor & Dewsbury, 2018). However, when explaining an abstract concept, a metaphor may be helpful if it hides features that correspond to common misunderstandings of the target. In this case, hiding would serve a learning or understanding function.

While the hiding aspect was recognized early in *Conceptual Metaphor Theory*, it was less clearly spelled out than highlighting in Lakoff and Johnson's (1980) theorizing and has been less in the focus in further studies. As an example, the conceptual metaphor UNDERSTANDING IS SEEING has been extensively analyzed with several methodological approaches, for instance

corpus linguistics methods (Deignan & Cameron, 2009) and frame analysis (Gemmell, 2015, also including Conceptual Integration Theory; Sullivan, 2013, 2016). All these studies focused on the highlighting function. As one of many examples, Sullivan (2013) shows how the frame elements associated with the semantic frame LIGHT_MOVEMENT are systematically transferred to the target concept UNDERSTANDING. To the best of current knowledge, no earlier study within *Conceptual Metaphor Theory* on the domain of understanding has targeted hiding (Danesi, 1990, 2001; Deignan and Cameron, 2009; Gemmell, 2015; Lakoff & Johnson, 1980; Lakoff et al., 1991; Sullivan, 2013).

The present research proposes a systematic approach to addressing the hiding aspects and test them on metaphorical notions of understanding. This approach is based on the assumption that hiding might best be understood by analyzing different source domains for the same target concept and by comparing which mappings appear only in some of them and not in others (Kövecses, 2002). As all mappings are partial, there will be a multitude of candidates for hidden elements that will subsequently be organized and structured.

Kövecses (2017, 2021, 2022, 2023) argues that conceptual metaphors can be differentiated between the levels of image schemas, domains, frames, and mental spaces and that the methodology of analysis differs with each structure. Frames and domains are relevant for the present research because they provide a systematic possibility to describe mappings of metaphors and allow a data-based categorization of metaphorical expressions to conceptual structures.

According to Sullivan (2023), frames can be differentiated into cognitive, communicative, and semantic frames; the latter is used in this study to analyze the conceptual structure of metaphors. Ruppenhofer et al. (2010, p. 5) define frames as "a script-like conceptual structure that describes a particular type of situation, object, or event along with its participants and props." This conceptual structure and the corresponding content are evoked when lexical units associated with that particular frame are used (Fillmore, 2014). These "participants and props" are frame elements, which can be classified as either core or non-core. The core elements, or participants of a frame, are essential to the frame structure, whereas the non-core elements, the props, are optional and enrich the conceptual structure with further information (Sullivan, 2023).

The differentiation between domains and frames is controversial (Cienki, 2007). According to Langacker (1987, p. 488) the conceptual structure of domains is defined as "a coherent area of conceptualization relative to which semantic units may be categorized". According to Kövecses (2017), both domains and frames are conceptual structures in long-term memory and can be differentiated based on schematicity and specificity. In contrast

to frames, domains are more schematic and less specific. Kövecses (2017) offers conceptual metaphors as examples that are based on domains: COMMUNICATION IS TRANSFER, IDEAS ARE OBJECTS, COMPLEX ABSTRACT SYSTEMS ARE BUILDINGS, or IDEAS ARE PERCEPTIONS. Following Sullivan (2013), it is argued that conceptual domains can be structured through semantic frames. The elements of these domains, however, are not clearly defined as in the semantic frames. Frames from FrameNet were created by analyzing grammatical constructions from large corpora and assigning them to conceptual structures. Therefore, they are supported by a substantial body of data (Ruppenhofer et al., 2010). Domains do not have specific elements to analyze the mappings, because they are more schematic and superordinate in nature (Kövecses, 2017). Accordingly, the level of semantic frames, together with the data provided by FrameNet, is employed to analyze the mappings between the source frames and the target concept of understanding.

Based on the Invariance Principle (Lakoff, 1993) and the Extended Invariance Principle (Ruiz de Mendoza, 1998), Sullivan (2013, 2017) argues that the conceptual structure of frames also preserves its structure in metaphorical mappings. When a semantic frame is used metaphorically, all frame elements that are in accordance with the inherent structure of the target domain are mapped onto the target concept.

Once again, the example of GETTING will be used for illustration. In FrameNet, the core elements of the GETTING frame are RECIPIENT ("the RECIPIENT indicated the entity that ends up in possession of the THEME") and THEME ("the THEME is the object that changes possession"). These core elements are mapped onto the target concept of understanding if the lexical units that evoke this particular frame are used metaphorically. In this context, the RECIPIENT is the understanding person, and the THEME is knowledge, insight, an explanation, or understanding itself. Understanding is conceptualized as an act of transmission, whereby the understanding person comes into possession of an object.

In order to answer the research question about which elements of understanding are hidden by common metaphors for understanding, a study was conducted in which participants were explicitly asked to produce a metaphor about understanding (Elicited Metaphor Analysis, Low, 2015). A total of 298 metaphor texts in English were collected (Porwol & Scharlau, 2025). This paper focuses on the hiding inherent in the mappings by different conceptual metaphors. The analysis of the mappings employed the FrameNet analysis introduced above. A companion paper will complement this work by comparing the mappings to the definitions of the target concept of understanding.

2 Methods

Participants were first-language speakers of English obtained via the online platform Prolific. They were at least 18 years old. No other demographic data were recorded. All participants gave written informed consent to the terms of the study and data processing. The study was approved by the Ethics Committee of Paderborn University, Germany.

Materials. The participants were explicitly asked to produce metaphorical expressions about the target concept understanding in response to the following prompts:

1. Imagine you meet a peer who, for some reason, has no understanding of what "understanding" means.
2. Please choose an image/analogy/metaphor for "understanding" and use it to explain to your peer what "understanding" is like.
3. Write your explanation in the box below. Start your text with the sentence "Understanding is like …".
4. What about your image/analogy/metaphor fits your concept of "understanding" and what doesn't?

There is no right or wrong when answering these questions. We are simply interested in what you imagine "understanding" to be like in as much vividness as possible.

The participants had to write at least 1000 characters in their metaphor text.

Procedure: The metaphors in the texts were identified with a standardized method for metaphor identification (*MIPVU,* Steen et al., 2010). The meaning of every lexical unit is compared to the basic meaning in a dictionary. The *Macmillan English Dictionary for Advanced Learners* (Rundell, 2007), which was also used in the testing of *MIPVU*, and in cases where the *Macmillan* did not provide a conclusive answer, the *Oxford Dictionary* (Oxford University Press, n.d.) were used. If the meaning of a lexical unit used in a text differed from the basic dictionary definition, the word was identified as a metaphor. In this study, only metaphorical lexical units that related to the target concept of understanding were identified.

With the help of the frame-evoking elements listed in FrameNet[2], the metaphorical lexical units were allocated to and checked against the semantic frames. For example, the lexical units *acquire, gain*, *get,* and *obtain* were identified as metaphors for understanding. According to FrameNet, these lexical units evoke the frame GETTING and its corresponding frame elements. These frames were coded using Label Studio (Tkachenko et al., 2020). Highlighted aspects of understanding were worked out based on the semantic frames, the metaphorical mappings, the LUs, and their corresponding defi-

[2] The lexical unit index can be found at: https://framenet.icsi.berkeley.edu/luIndex

nitions. These aspects were then used to analyze all identified semantic frames. The corpus, which assigns elicited understanding metaphors to semantic frames, is made openly available at the Open Science Foundation[3].

3 Results

In the present paper, 298 English texts were analyzed. The texts had a mean length of 192 words. Two coders coded the material; interrater agreement was 86% and Cohen's κ = 0,86, which is an almost perfect agreement (Landis & Koch, 1977).

Overall, 91 different metaphorical expressions were identified that evoke 44 semantic frames in total according to the lexical unit index in FrameNet, which can be found in Table 1.

Other metaphorical expressions that were not listed in the lexical unit index were assigned to individual present frames on the basis of the Macmillan definition and the definition of the semantic frames, which are in brackets: *come on* (LIGHT_MOVEMENT); *go on, enlighten* (LOCATION_OF_LIGHT); *marry together* (BUILDING); *unlock* (CLOSURE); *further, broaden, deepen* (CAUSE_EXPANSION); *attain* (ACCOMPLISHMENT); *integrate, take in* (CAUSE_TO_BE_INCLUDED); *evolve* (PROGRESSION).

In the following, the results of the FrameNet analysis are presented. Firstly, in Table 1 the semantic frames are presented in rows with all aspects of the target domain that could be inferred from the semantic frames of the data. As already described, most of these elements are explicitly listed in the descriptions of the frames, the mappings of the elements, or the definitions of lexical units. Generally, the elements are binary. For instance, a shift either exists (as in a CHANGE_OPERATIONAL_STATE in *turning on* or *switching off*) or does not exist. Only the aspect modification summarizes several related elements. In general, modification indicates that an object is modified by an agent. As examples, *opening, creating, filling, extending* or *shaping* an object would highlight the modification aspect. Location changes were not coded as modifications because they do not change the object's inherent structure.

Secondly, individual mappings of the core elements are described for selected semantic frames in order to illustrate the highlighting. For the sake of brevity, the analysis focuses on the most frequent frames in the data.

[3] https://doi.org/10.17605/OSF.IO/Y6SMX.

Table 1
Semantic frames in rows, aspects of the target domain in columns. An X indicates that an aspect is highlighted by a frame, a hyphen that it is hidden. A tilde indicates the few cases where an element can be present in some LUs, but is absent in others or that the element can be optionally filled with a non-core element. The numbers after the frames represent the number of texts in which the semantic frame was evoked. The list of lexical units shows the metaphorical expressions from the data that were assigned to the semantic frames.

	Transfer	*Ownership*	*Intentionality*	*Duration*	*Dynamism*	*Modification*	*Foundation*	*Sociality*	*Completion*	*Progress*	*Control*	*Shift*	*Perception*	*Lexical Units*
GETTING (53)	X	X	X	-	-	-	-	~	X	-	-	X	-	*acquire, gain, obtain, get*
RECEIVE (3)	X	X	X	-	-	-	-	X	X	-	-	X	-	*receive*
POSSESSION (129)	-	X	-	~	-	-	-	-	X	-	X	-	-	*have, possess*
RETAINING (3)	-	X	-	X	-	-	-	-	-	-	X	-	-	*retain*
ARRIVING (19)	-	-	X	-	X	-	-	~	X	X	-	-	-	*approach, reach, come, get*
SELF_MOTION (8)	-	-	X	~	X	-	~	~	-	X	-	-	-	*climb, walk, go*
COTHEME (4)	-	-	X	~	X	-	~	X	-	X	-	-	-	*guide, lead*
MOTION_DIRECTIONAL (5)	-	-	-	-	X	-	~	-	-	X	-	X	-	*fall*
RIDE_VEHICLE (2)	-	-	X	~	X	-	~	-	-	X	X	-	-	*sail, ride*
FLUIDIC_MOTION (3)	-	-	-	-	X	-	~	-	-	-	-	X	-	*rush*
DEPARTING (1)	-	-	-	-	X	-	~	-	-	X	-	-	-	*disappear*
ATTACHING (15)	-	-	X	~	X	X	X	-	-	-	X	-	-	*attach, connect, link*
MANIPULATION (3)	-	-	X	~	X	-	X	-	-	-	X	-	-	*grasp, hold*
CLOSURE (12)	-	-	X	-	X	X	X	-	X	-	X	X	-	*open, unlock**
CAUSE_TO_BE_INCLUDED (11)	-	-	X	-	X	-	X	-	-	X	X	-	-	*add, include, integrate* take in**
GATHERING_UP (6)	-	-	X	~	X	-	-	~	-	X	X	-	-	*collect, gather*
ARRANGING (1)	-	-	X	-	X	-	-	-	-	X	X	-	-	*arrange*
BUILDING (36)	-	-	X	~	X	X	-	-	X	X	X	-	-	*build, construct, fit/marry*/put/piece together*
INTENTIONALLY_CREATE (78)	-	-	X	-	X	X	-	~	X	X	X	-	-	*create, develop, make, synthesize*
FILLING (6)	-	-	X	-	X	X	X	-	X	-	X	-	-	*fill, flood, plant*
RESOLVE_PROBLEM (14)	-	-	X	~	X	-	-	~	X	X	-	-	-	*solve*

Table 1 (cont.)

	Transfer	*Ownership*	*Intentionality*	*Duration*	*Dynamism*	*Modification*	*Foundation*	*Sociality*	*Completion*	*Progress*	*Control*	*Shift*	*Perception*	*Lexical Units*
ACTIVITY_FINISH (8)	-	-	X	-	-	-	-	-	X	X	-	-	-	*complete, finish*
CAUSE_EXPANSION (7)	-	-	X	~	X	X	-	-	-	-	X	-	-	*broaden*, deepen*, expand, further*, widen*
CHANGE_OPERATIONAL_STATE (19)	-	-	X	-	-	X	-	-	X	-	X	X	-	*flick*, turn on, switch on*
GETTING_TRIGGERED (4)	-	-	-	-	-	-	-	-	-	-	-	X	-	*go off*
CREATE_PHYSICAL_ARTWORK (3)	-	-	X	-	X	X	-	-	X	X	X	-	-	*draw, paint*
CAUSE_MOTION (8)	-	-	X	~	X	-	-	-	-	X	X	-	-	*draw*
RESHAPING (9)	-	-	X	X	X	X	-	-	-	-	X	-	-	*form*
SOAKING_UP (3)	-	X	-	~	X	X	-	-	-	X	-	-	-	*absorb, soak up*
REMOVING (5)	-	-	X	-	X	X	-	-	-	X	-	-	-	*clear, remove*
CAUSE_TO_FRAGMENT (1)	-	-	X	-	X	X	-	-	-	X	X	-	-	*break down*
SEPARATING (1)	-	-	X	-	X	X	-	-	-	X	X	-	-	*separate*
PERCEPTION_EXPERIENCE (52)	-	-	-	~	X	-	-	-	X	-	-	X	X	*experience, hear, perceive, see*
PERCEPTION_ACTIVE (12)	-	-	X	~	X	-	-	-	-	-	-	-	X	*listen, look, observe, view, watch*
LIGHT_MOVEMENT (6)	-	-	-	-	-	-	-	-	-	-	-	X	X	*come on*, shine*
LOCATION_OF_LIGHT (15)	-	-	-	~	-	-	-	-	-	-	-	X	X	*bright up, enlighten*, go on*, illuminate, light up,*
LOCATING (8)	-	-	X	-	X	-	-	-	-	-	-	X	X	*find*
SUITABILITY (15)	-	-	X	-	-	-	X	-	-	-	-	-	-	*fit*
MAKE_NOISE (8)	-	-	X	-	-	-	-	-	X	-	-	X	-	*click*
CAUSE_IMPACT (2)	-	-	-	-	X	X	-	-	-	-	-	X	-	*crash, strike*
ENTER_AWARENESS (6)	-	-	X	-	-	-	-	-	-	-	-	X	X	*come to*
BECOMING_AWARE (18)	-	-	X	-	-	-	-	-	-	-	-	X	X	*discover, find out, recognize, pick up*
DIFFERENTIATION (2)	-	-	X	-	X	-	-	-	-	-	-	-	X	*collate*, sort*

Table 1 (cont.)

	Transfer	*Ownership*	*Intentionality*	*Duration*	*Dynamism*	*Modification*	*Foundation*	*Sociality*	*Completion*	*Progress*	*Control*	*Shift*	*Perception*	*Lexical Units*
READING_ACTIVITY (1)	-	-	X	X	-	-	-	-	-	X	-	X	-	*read*
INGESTION (2)	-	-	X	~	X	X	X	-	-	X	X	-	-	*eat*
ACCOMPLISHMENT (11)	-	-	X	~	X	-	-	-	X	-	-	X	-	*achieve, attain**
EXPANSION (10)	-	-	-	~	X	X	-	-	-	X	-	-	-	*grow*
PROGRESSION (17)	-	-	X	~	X	-	-	-	-	X	-	-	-	*evolve*, develop, progress*
OBVIOUSNESS (25)	-	-	-	-	-	-	-	-	-	-	-	-	X	*clear*

The following sections analyze the most common semantic frames.

POSSESSION

The semantic frame POSSESSION, which is evoked by the lexical units *have* or *possess,* was most frequent in the data (it occurred in 129 out of 298 texts). It involves the core elements OWNER (understanding person) and POSSESSION (knowledge, insight). The frame highlights the acquisition and persistent storing of understanding. The duration of the possession is not clearly defined by the semantic frame and can be filled, because DURATION is a non-core element. Possessing the object, the owner has control over the entity. The frame further highlights that the understanding process is finished, and that the understanding only needs to be stored. However, possessing the understanding does not indicate a pre-existing system. Concerning hidden elements, the social aspect is excluded. Possessing an object is neither an intentional nor a dynamic process. The POSSESSION is not modified in any meaningful way by the agent. The semantic frame does not highlight that there is a shift or that there is a development. In contrast to POSSESSION, RETAINING highlights the duration of the action, and it can also be further specified. Similarly to POSSESSION, the act of perceiving is also not emphasized in this particular frame.

INTENTIONALLY_CREATE

The frame INTENTIONALLY_CREATE (78 texts) is evoked by the lexical units *create, develop, make* as well as *synthesize* and contains the core elements CREATOR, which is filled by the understanding person and the CREATED_ENTITY

understanding. Similarly to BUILDING, this frame highlights the agency of the understanding individual, who intentionally creates new entities and, in doing so, significantly transforms an object. Throughout this highly dynamic process, the creator maintains control over the understanding. Furthermore, this particular frame highlights the longer developmental aspect of the understanding process, showing different levels of understanding. However, there is no sudden shift in the understanding. Other frames of the target concept highlight the transfer of knowledge and the acquisition of understanding. This particular frame does not highlight the social aspect which is for instance highlighted by RECEIVING, but it can be optionally included. Further, there is no pre-existing system; the entity is newly created.

GETTING

The semantic frame GETTING was present in 53 texts, being evoked by *acquire, gain, get* and *obtain*. It involves the core elements of the RECIPIENT and the THEME, which are mapped as the understanding person and the knowledge, insight, or as an explanation. The frame thus highlights an intentional transfer in which a defined object changes its location, which leads to the possession of the theme. This also highlights the completion of a shift from one state to another. At the same time, the acquisition of an object is not a dynamic process, in which an object merely changes its location or structure, as shown in INTENTIONALLY_CREATE for instance.

In contrast to INTENTIONALLY_CREATE or BUILDING, GETTING does not highlight the developmental aspect of understanding or the aspect of control over an entity. The foundational aspect, which is for instance highlighted by FILLING, is also hidden. GETTING also does not highlight the social aspect of understanding, whereas the closely related RECEIVING does. The aspect of perception is not highlighted by GETTING, but is emphasized by the following frames.

PERCEPTION_EXPERIENCE

PERCEPTION_EXPERIENCE (52), which includes the lexical units *experience, hearing, perceiving,* and *seeing*, contains the core elements BODY_PART, PERCEIVER_PASSIVE and PHENOMENON. The frame-element PERCEIVER_PASSIVE is the understanding person, the PHENOMENON is the information or insight and the BODY_PART is the mind. This frame highlights the sudden shift from not understanding to understanding. The process is further highlighted as a finished experience, in which perception is essential. All other aspects are hidden. The passive perceiver does not act intentionally, in contrast to PERCEPTION_ACTIVE, which is, for example, evoked by *look*. There is no social aspect, no transfer, and no possession involved in this semantic frame. The develop-

mental aspect, which is especially highlighted in the semantic frames of motion, is also not covered. The perceiver neither controls nor alters the phenomenon.

The degree of understanding can be influenced, for instance, by the light, which was frequently mentioned in the data: “I see it as a lightbulb in my head which lights up”. There are also frames that address the usage of light like LIGHT_MOVEMENT and LOCATION_OF_LIGHT. The lexical units *illuminate* and *light_up* evoke the frame LOCATION_OF_LIGHT (15 texts). Similarly to the other visual frames, this frame highlights the sudden feeling of understanding. All the other aspects are hidden. Enabling the act of seeing, the usage of light undermines that understanding is associated with visual perception. In the data, either a place near the agent is illuminated, which allows perception of the room, or the agent’s mind is lit up, which depicts understanding.

Unsurprisingly, each metaphor hid at least some aspects – the hyphens in Table 1. What is more important is that some aspects were hidden by more metaphors than others, and some were even hidden by most of the metaphors (compare the columns of Table 1).

The aspects hidden most often are (in descending order):

— *Sociality*, which highlights that understanding occurs or is constructed in interaction with other sentient entities (as for instance in most, if not all, learning situations),
— *Transfer*, which is the metaphorical conceptualization of acquiring objects from other entities,
— *Ownership*: Closely related to Transfer, acquisition conceptualizes that an object is possessed, indicating ownership,
— *Foundation*, which emphasizes the presence of an existing structure that is extended upon or modified,
— *Duration*, in which understanding is seen as extended and gradual,
— *Perception*: Here, understanding is conceptualized through perception. Understanding is not acquired or constructed, but revealed or seen.

These aspects were absent in most of the understanding metaphors. To give an example, few frames present understanding as an extended process (an example is RESHAPING with the lexical unit *form*), many others hide its duration (e.g., frames GETTING, MAKE_NOISE or PERCEPTION_EXPERIENCE). This is in strong contrast to actual understanding processes which often take a long time. Although sudden "aha moments" can occur and a subjective sense of understanding may develop quickly, the cognitive effort required for deep understanding takes time. In semantic frames evoked by understanding metaphors, understanding is rarely presented as related to social embeddedness, possession of knowledge, a pre-existing structure, extension or gradualness, or a sudden moment of perception. Interestingly, three of these aspects are common when speaking about understanding and learning. In

this context, these are, as Sfard (1998) has argued, transfer and ownership, and, quite generally in Western culture, perception. It is debatable whether these aspects are hidden in actual usage. Social embeddedness, the structure of understanding, and the gradual und slow development of understanding, which lack the advantage of frequent and common usage, are features that might truly be hidden by the available metaphors. Common metaphors rarely refer to understanding as a social occurrence or its internal structure. More often than not they present understanding as sudden and brief.

Least often hidden were (in ascending order):

— *Control*, highlighting the ability to contain or control entities,
— *Progress*, that is a gradual development towards understanding,
— *Dynamism*, the process as evolving and changing rather than being understood as a fixed state,
— *Intentionality*, i.e. a goal-directed process driven by conscious effort

To detail a feature that is rarely hidden, few frames present a nonintentional case. Most frames highlight that deep understanding requires intentional effort and some frames highlight that understanding comes without conscious action or without high effort. Few frames like SOAKING_UP, PERCEPTION_EXPERIENCE (*hear* and *see*) and light-related frames lack intentionality.

4 Discussion

Although there is a large body of research on metaphors for understanding, hidden aspects were not identified and problematic implications were not in the focus. Based on elicited metaphor texts, in which participants were asked directly to produce metaphors for the target domain of understanding, the semantic frames invoked by metaphors for understanding were identified and the highlighted and hidden aspects were analyzed.

In summary, the frames inherent in common metaphors of understanding hide the aspects *Sociality, Transfer, Ownership, Duration, Foundation*, and *Perception*. These aspects fall into two categories: frequent and rare metaphors. Perception, especially *seeing*, is a very common metaphor of understanding in Western culture, as indicated by tits extensive study in metaphor research (see, for instance, Deignan & Cameron, 2009). Similarly, acquisition is prominent in discussions about learning (Sfard, 1998). Elements of foundation are present, among others, in learning taxonomies (e.g., Krathwol et al., 1969). The actual frequency of usage of these elements would have to be taken into account before making statements about what is hidden.

On the other hand, understanding is rarely seen as a social process or one that includes social elements. This aspect of understanding appears to be hidden, as it can only expressed through very few common metaphors. Also,

few metaphors describe understanding as a longer, more complex process. Both features – social embeddedness and extended processes – have high face validity. However, a definite answer would require mapping the metaphors to theories of understanding in order to evaluate their appropriateness.

5 Conclusion

To sum up, the present study expanded the range of metaphors about the target domain of understanding with the help of elicited-metaphor data. It has been demonstrated that semantic frames can be used to identify highlighted and hidden aspects, thereby expanding the methods that can be used for their identification and analysis. The notion of frames was used to systematically identify the highlighted and hidden aspects of the target concept.

All metaphors are partial. No metaphor perfectly describes the process of understanding (or any other target domain). However, the structured analysis may help identify misconceptions caused by certain metaphors, especially when used in isolation without other metaphors or literal explanations of understanding.

One limitation of the present study is that it uses only one language. It may be said that the German metaphors collected in the same study were quite similar (Porwol & Scharlau, 2025), but this may not be the case for other languages. Another limitation is the omission of metaphor usage in the analysis. This pertains not only to the frequency with which metaphors are used (as previously discussed, perception metaphors appear to be quite frequent, even though they are among the few frames that highlight perception), but also to the question of whether combinations of metaphors, or combinations of metaphors with literal descriptions might compensate some of the lopsidedness of single frames.

Taken together, the findings suggest that, although metaphors offer valuable insights into how people conceptualize understanding, they may also constrain this process by systematically hiding certain aspects. Recognizing which aspects are marginalized – such as social interaction or progress – can inform both theoretical models of understanding as well as practical applications for communication, education and AI development. Another important question is whether understanding metaphors elicit framing effects (Flusberg et al., 2024), or, influence how people perceive and shape comprehension processes and their contexts (e.g., learning or explanatory situations), and how this in turn affects their understanding. Furthermore, cross-cultural comparisons are needed to determine whether the identified patterns are universally applicable or are culturally specific. By doing so, we may move closer to a more nuanced grasp of what it means to understand.

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