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Reviewed by Asma Dhifallah and Tuomas Huumo

1 Introduction

In recent decades, metaphors of time have become a popular research object in Cognitive Linguistics. Most attention has been paid to metaphors that use motion as their source domain (or source frame), such as *We are approaching Christmas* or *Christmas is coming*. However, the category of temporal metaphor obviously covers a much wider array of expressions, including ones in which motion is not the primary source concept for a metaphorical depiction of the experience of time.

Zsuzsa Máthé's doctoral dissertation *What does time do? The spatialization and the transience of time in English, Finnish, and Hungarian* is a study on temporal metaphors in three languages: English, Finnish, and Hungarian. The main focus is on the verbs and verb constructions in figurative expressions of time. Besides motion-based metaphors, Máthé analyzes force-dynamic (cf. Talmy 2000a: Ch. 7) metaphorical expressions in which 'time' is represented as an agentive entity (for example, 'time destroys...' or 'time heals...'). Additionally, the author analyzes expressions in which a noun signifying 'time' is a genitive modifier within a noun phrase, such as the English *wheel of time* or the Finnish *ajan hammas* 'tooth of time', as well as a wide array of novel (innovative) metaphors of time in the three languages. These often rely on sound-imitative verbs and present the elapse of time as an aural image, as in *Time was gushing through the wound like arterial blood* (Charles L. Harness), or use innovative spatial imagery, as in *Their compassion broke through the walls of time* (Frank Bergon). The analysis is based on well-established cognitive-linguistic frameworks, most notably Conceptual Metaphor Theory (CMT), and is inspired by the seminal works of Lakoff and Johnson (e.g., 1980), Evans (e.g., 2004), and Kövecses (e.g., 2010, 2015).

2 Part 1: Theoretical foundations (Chapters 1–2)

The book begins with an introduction (Ch. 1), which lays out the objectives of the research, introduces the organization of the study and briefly presents the methodology and research materials in use. The author states (p. 11) that her main research question is to find out what 'time' does in language, with a focus on verbs of motion and causation with a subject argument meaning 'time'. In other words, the study is focused on uses of the nouns *time* (English), *idő* (Hungarian), and *aika* (Finnish) as subjects of motion verbs and verbs of causation. Moreover, the author analyzes uses of 'time' as a genitive modifier of another noun with a metaphorical meaning, as in 'the wheel of time', 'the tooth of time', 'the mill of time', 'the sands of time', among others. In clause-level expressions, such metaphorical entities have a variety of different roles, for example as metaphorical forces, places, or obstructions.

The two main types of conceptual metaphors under study are TIME IS A MOVING ENTITY ('time' used with a motion verb) and TIME IS A CHANGER ('time' used with a verb

of causation). The author also considers more specific, often idiomatic metaphorical expressions in each language that instantiate these general metaphors. TIME IS A MOVING ENTITY metaphors are mostly expressed by intransitive verbs of motion, while transitive (semantically causative) verbs are used in TIME IS A CHANGER metaphors. The comparison of the three languages is expected to bring up differences in the ways such metaphors are realized, and in the ranges of use of these highly schematic conceptual metaphors and their more specific elaborations, even though both main types of conceptual metaphors are known to exist in all three languages. As regards motion metaphors of time, which have been studied extensively in Cognitive Linguistics (as the author points out on p. 12), the focus of the research at hand is on expressions known as Moving Time metaphors, which code a temporal entity as the mover (e.g., *Christmas is coming*), as opposed to Moving Ego metaphors that represent Ego, the experiencer of time, as the mover (*We are approaching Christmas*). The latter type is not studied, which follows from the restriction that a nominal meaning ‘time’ must be the subject of a motion verb. In addition to these two main types of conceptual metaphors, the author analyzes constructions with the noun ‘time’ as a genitive modifier of another noun. This third group is thus based on form, not (directly) on meaning.

Chapter 2 lays out the theoretical foundation of the work. The author first briefly discusses the concept of time and its foundations in cognitive science and cognitive linguistics (2.1), the general relations between time and space (2.2.), different roles of ‘time’ as either a MOVER or a CHANGER (or more generally, a FORCE) in her analysis. She then introduces the cognitive-linguistic models in use, which include Conceptual Metaphor Theory, as first introduced by Lakoff and Johnson (1980) and more recently elaborated by Kövecses (e.g., 2010, 2015; Section 2.4), Conceptual Blending Theory (Fauconnier and Turner 2002; Section 2.7), and Talmy’s (2000a, 2000b) model of Cognitive Semantics, in particular its motion event descriptions and analyses of force dynamics. The author also discusses cognitive-linguistic perspectives on metonymy (2.5), idioms (2.6), and image schemas (2.8). This versatile chapter ends with a discussion of variation and universality between languages and cultures (2.10), to set up a foundation for the comparison of the three languages under study.

Chapter 2 is an impressive sum-up of different cognitive-linguistic approaches on temporal metaphor. However, it is regrettable that the seminal works by Kevin Ezra Moore (e.g., 2014), are not mentioned at all. The classification of temporal metaphors proposed by Moore (2014) in particular might have been useful in a detailed analysis of the motion metaphors, to determine the direction of the metaphorical motion as advancing toward later or earlier times on the (metaphorical) timeline. For instance, in all three languages verbs meaning ‘advance’ (pp. 83–85) seem to indicate motion from earlier toward later (or toward the future), in accordance with Moore’s NOW IS A MOVER metaphor, while ‘pass’ verbs (pp. 90–91) instantiate what Moore calls EGO-CENTERED MOVING TIME metaphors with advancement ‘past’ Ego (the EXPERIENCER of time) from the future toward the past (or earlier times), as in *Time was passing quickly*.

3 Part 2: Quantitative commentary (Chapters 3–5)

Chapter 3 presents the qualitative results of the comparative study of the three languages. The framework in use is first briefly introduced (3.1), and this is followed by analyses of metaphors of motion with ‘time’ as the subject of a motion verb (3.2), force-dynamic metaphors of causation, with ‘time’ as the subject of a causative verb (3.3), and genitive

constructions in which ‘time’ is a genitive modifier of another noun (3.4). The comparison of the three languages is performed on three levels: 1) the linguistic level (the literal meaning of the expressions), 2) the figurative level (the metaphorical meaning of the expressions), and 3) the conceptual level (the conceptual metaphor that motivates the combination of the literal and figurative meanings). On pp. 80–81, the author presents a primary list of motion verbs used in motion metaphors in the three languages, with ‘time’ as their subject. As special cases, she also considers positional verbs such as ‘bend’, ‘expand’, ‘loop’ and ‘stretch’, and verbs of three-dimensional motion such as ‘expand’ or ‘shrink’. Such verbs often express fictive motion. Metaphorical expressions based on these verbs are then compared qualitatively in detail (pp. 83–124).

Section 3.3 presents a similar comparison of force-dynamic verbs in TIME IS A CHANGER metaphors. These involve a force-dynamic scenario with two participants, referred to as Agonist and Antagonist, that exert opposing forces upon each other. The section begins with a detailed discussion of force dynamics and the polarity of the exerted force: whether ‘time’ brings about a positive or a negative change. The author points out (p. 135) that since force-dynamic metaphors present ‘time’ as an AGENT which exerts a force on an object or an entity, its role is commonly that of the Antagonist, while the object entity is the Agonist and undergoes the force-dynamic effect exerted by ‘time’. In the metaphorical force-dynamic scenarios, the Antagonist is the stronger participant of the two. The Agonist usually has a tendency towards rest (more generally, to maintain the situation unaltered), while the Antagonist ‘time’ then brings about some kind of a change. On pp. 146–150, the author presents the force-dynamic verbs under study in two tables that juxtapose expressions of the three languages compared: first in alphabetical order (Table 7) and then in groups based on their polarity (Table 8). Many positive-polarity verbs indicate meanings such as ‘heal’, ‘ease’ or ‘teach’, while negative verbs carry meanings such as ‘destroy’ or ‘devour’. Neutral-polarity verbs, such as ‘alter’, ‘prove’, or ‘take’, take on a polarity that depends on the context, more precisely on the nature of the object referent and its positive or negative effect (for example, ‘time’ can ‘bring’ both positive and negative consequences).

Section 3.4 shifts from a metaphor-based to a structure-based approach by analyzing metaphorical expressions with ‘time’ as a genitive modifier of another noun, as in ‘the wheel of time’, ‘the hands of time’, ‘the tooth of time’, and ‘the current of time’. These are idiomatic, often language-specific expressions that base their metaphorical meaning mostly on the head noun of the modifier ‘time’. Many (though not all) of these metaphors can be classified into the two main types of conceptual metaphors in the focus of the study. For example, TIME IS A MOVING ENTITY motivates metaphorical NPs such as ‘the current of time’, ‘the stream of time’, ‘the wheel of time’, while TIME IS A CHANGER is a motivation for ‘the mill of time’ (also involving motion), ‘the tooth of time’, or ‘the sieve of time’.

Chapter 4 is dedicated to novel, often language-specific metaphors that have mostly escaped the attention of earlier research. These consist of two main types: 1) aural images with sound-imitative verbs, such as the English *whizz* or *gush* (metonymically evoking fast motion), or *tick* or *click* (metonymically evoking a clock) among others, and 2) expressions of visual images, such as natural disasters (‘The waves of time are smashing’), animals (*Time flaps about*), vapor (*Time evaporated in my exhilaration*), monstrosity (*time’s tooth [was] chewing up lives...*), and anthropomorphic expressions (*Time is a cruel mistress*). As can be seen, these metaphors are very innovative, versatile, and often based on vivid imagery.

Chapter 5 is, perhaps somewhat misleadingly, titled *Overview of results*, but rather than an overview it is actually a detailed presentation of the results of a quantitative study of the used corpora from the point of view of six “scales”: 1) frequency (of semantically equivalent verbs in each language), 2) dynamicity (the rate of motion in moving time metaphors as slow, steady, or fast), 3) polarity (negative, positive, or contextually alternating effect of ‘time’ in a force-dynamic event), 4) salience (entrenchment of the metaphors), 5) stability (collocational strength of ‘time’ with individual verbs), and 6) specificity (of a metaphor to an individual language in the sample). Since the statistical analysis relies so strongly on these scales, we explore them and the results obtained by each one of them in detail below.

The frequency scale is based on raw vs. normalized frequencies in the data. Tables 13 and 14 (p. 246–252) indicate the most frequent verbs of motion and the most frequent verbs in causative constructions, respectively. These tables are undeniably valuable for researchers examining the time metaphors and selecting verbs of corpus searches, bearing in mind that the values presented are based on metaphors with the lexeme ‘time’. In addition to presenting the most frequent verbs, this section also concludes that English expresses transience mostly through the spatialization of time, while Finnish and Hungarian rely more heavily on TIME IS A CHANGER metaphor (p. 258).

The dynamicity scale concerns TIME IS A MOVING ENTITY metaphors. The dynamicity scale illustrates both the rate of motion and the dynamic-static dichotomy underlying the metaphor TIME IS A MOVING ENTITY (p. 258). This scale includes four subclassifications proposed by Evans (2004) and employed to group the motion verbs used in the metaphor. They are: 1) fast; 2) context-dependent, or steady; 3) slow; and 4) static rates of motion. This classification departs from traditional motion typologies and offers a novel approach that reflects how the three languages conceptualize the motion of time. However, while the three categories of static, slow, and fast motion are reliable, verbs in the category *context-dependent or steady motion* can be easily modified with adverbs or other particles changing the neutral or steady pace of motion.

This section shows that English has a higher tendency towards steady motion than Hungarian and Finnish (p. 260). More generally, throughout the analysis, Finnish and Hungarian exhibit more similarities to each other than to English. However, a more complex multivariate clustering method is needed to substantiate these observations.

The polarity scale focuses on TIME IS A CHANGER metaphor and consists of three classifications: positive, negative, and context-dependent/neutral metaphors. The central question explored here is whether the lexeme ‘time’ in TIME IS A CHANGER metaphors is predominantly framed in one of these categories across a large set of representative expressions in the three different languages. In other words, the study examines whether time is generally described as having a positive or negative causative impact.

From a quantitative perspective, the author concludes that “it seems that what time ‘does’ in language is more often positive or neutral than negative, and this is true for Finnish, Hungarian as well as English” (pp. 263–264). However, since the majority of verbs (in terms of raw metaphor token counts) are context-dependent or neutral, this division has limited explanatory power. As a result, evaluations of time’s polarity remain highly context-dependent and likely influenced by register. More informative than raw frequencies, however, is the distribution of verbs by causation in Table 20, which offers insight into the specified verbs within each category and opens venues for further investigation. Qualitatively, the analysis highlights an interesting psycholinguistic connection between novelty and negativity, noting that “negative polarity force patterns

in time metaphors are more frequently novel, low frequency, and emotionally charged; positive polarity, or neutral metaphors, are often idioms or conventionalized expressions” (p. 264).

The salience scale is defined as a function of type and token frequencies (p. 266). The author then considers three methods of quantifying it: token/type ratio, type/token ratio, and the sum of token and type percentages combined with the number of metaphorical mappings. Each method defines salience differently. The author applies all three methods and adapts the third by using metaphorical entailments instead of mappings to quantify salience ratios.

The salience scale depends on a clear type/token division to create a quantifiable hierarchy. The author illustrates salience using the example of metaphors of *time moving through air*. However, the core analysis focuses on the salience of stationariness vs. dynamism, along with Ground + Vector salience in TIME IS A MOVING ENTITY metaphor, and negative and positive polarities in TIME IS A CHANGER metaphor. To quantify the number of mappings within a metaphor, the author cites the mappings of TIME IS A MOVING ENTITY metaphor from Lakoff (1993), but ultimately focuses on a single mapping that depicts time as an agent, namely “the passing of time is motion” (ibid, pp. 216 – 217). Six entailments are deduced from this mapping, all of which are empirically derived from the studied data and are shared across the three languages. Additionally, three additional entailments are identified, though these are shared by only two of the three studied languages. Following this, the author cites three entailments of TIME IS A CHANGER that focus on the polarity of change.

Although the block text descriptions of the salience ratios are somewhat dense for the reader, the analysis is generally lucid. The author observes that “the results of the salience scale are similar to the results of the frequency and the dynamicity scale” (pp. 276 – 277). Overall, there is converging evidence (from frequency and salience) supporting the entrenchment of dynamic (over static) metaphors and context-dependent (over positive and negative) polarities across the studied languages.

The stability scale is defined as “a co-occurrence scale [which]... investigates the strength of ‘time’ (as a word form) and verb collocations (as lemmas)” (p. 277). The author calculates the co-occurrence value of time metaphors using the lemma ‘time’ and collocates within the span of three words. The procedure for identifying collocates starts with a cleansing of the corpus to remove homonymous uses of the word *aika* (time) in Finnish, the polysemous uses of the Hungarian *idő*, and the uses of *time* in idiomatic expressions in English (e.g. *the first time*, *the last time*) (p. 279). Next, the author presents three methods for calculating stability scales: the O/E Ratio, or the Observed to Expected Ratio; the I-value using the Mutual Information Score; and the T-value used to assess the statistical significance of the co-occurrence.

The final presentation of the values ultimately relies on the O/E ratio and log₂ values. Specifically, the log₂ values in Tables 31, 33, and 35, which show motion verbs in the three languages, and Tables 37, 39, and 41, which present causative verbs, show the strength of the association between motion verbs and time metaphors across the languages. What’s more, the analysis reveals that examining collocation values based solely on isolated verbs can be misleading. Instead, the author emphasizes the importance of considering the role of verbal particles in shaping co-occurrence values, as they influence the strength of the association with metaphors. Consequently, the results shown in the tables primarily present verb + particle combinations (i.e. *go on*, *by*; *stand still*, etc.) or specific expressions (e.g. *wait for no one*) rather than isolated verbs.

The specificity scale concerns the degree of conventionalization of the metaphors. Using the Conventional Figurative Language Theory (Dobrovols'kij & Piirainen, 2005, 2018) and the Hierarchical Mental Metaphor Theory (Casasanto, 2017), the author presents a scale of metaphors with two binary polarities, ranging from unique/innovative metaphors to entrenched/dead metaphors. On the one hand, entrenched metaphors are conventionalized, frequently reproduced in speech using the same wording, and tend to become idiomatic over time. These metaphors are more likely to evolve into dead metaphors, and they also serve as a foundation for the creation of novel metaphors. On the other hand, unique or novel metaphors are innovative, rarer in usage, and less frequent than dead metaphors. They are also often derivatives of dead or entrenched metaphors.

The specificity scale aims to identify novel metaphors and explain different sources of variation. To achieve this, the author introduces two types of variation. The first is source-internal variation, which results from an extension of an aspect of the source domain through an entailment. The second is source-external variation, where the metaphor employs a new source domain.

The analysis identifies four cases of source-internal variation (entailments) in Hungarian, two in English, and three in Finnish. Concerning source-external variation, the study defines new metaphorical mappings: one in English, three in Hungarian, and three in Finnish.

The author explains the existence of novel metaphors in terms of blending. Building on this, it may be beneficial to use conceptual blending not only to justify the existence of novel metaphors but also to illustrate how novel entailments emerge in source-internal variation and how new source domains are integrated into source-external variation. Besides, incorporating grounding scenarios into Table 42 would have strengthened the conceptual foundation of source-internal variation. That said, these are not limitations, but suggestions for potential expansions of the work in the future.

4 Conclusion

Overall, the presentation of the results in Chapter 5 in extensive multi-page tables can be difficult to follow. It might have been helpful to highlight or bold the most important figures (mentioned in the text commentary) to improve clarity and further aid the reader. Besides, the process for deducing the different entailments (in describing source-internal variation and calculating salience) and identifying the metaphors for source-external variation is not explicitly mentioned. That is, it is unclear whether this was based on annotation, introspection, or another methodological approach.

In general, Máthé's work is an impressive corpus-based study on metaphors of time in three languages. She employs three large corpora: The corpus of Contemporary American English (COCA) for English, the *Magyar Nemzeti Szövegtár*, or The Hungarian National Corpus, and *Kielipankki*, or The Language Bank of Finland, complemented by a sub-corpus of online chats in Finnish to achieve a sample of formal, informal, and literary contexts of use.

The querying process searches for the word 'time' as a node word, not a lemma, and finds verbs appearing within a two-word span (before and/ or after 'time'). Altogether 150 metaphor-signaling verbs are examined in each of the three languages based on five criteria, including the type of metaphor (TIME AS A MOVING ENTITY OR TIME IS A CHANGER), the use of 'time' as a metaphorical agent, the verb inflection in the 3rd person singular, the frequency of the metaphor (4 hits 0.003-0.004 normalized frequency and the variety

of registers/contexts (p. 13). The low-frequency threshold of 4 hits indicates high recall, meaning that the study does not focus solely on selecting high-frequency metaphors (which would necessitate a high-frequency threshold); rather, it includes a broad range of both high-frequency and low-frequency metaphors. This approach proves useful for analyzing novel metaphors across different scales (notably, specificity and polarity), making the analysis more comprehensive.

In causative constructions, especially genitive constructions, the association of ‘time’ with TIME is stronger and more reliable, potentially reflecting *what time does* in language. In motion metaphors of time, however, the lexeme ‘time’ refers only to a small subset of potential temporal entities. Additionally, at least in English, in moving time metaphors, adding the definite article ‘the’ (as in ‘the time’), the indefinite article ‘a’, or otherwise possessive suffixes and demonstratives, can transform the word from a generic mass noun (denoting the domain of TIME) to a bounded specific noun that refers to a particular moment or period.

In sum, we can conclude that Zsuzsa Máthé’s study is an important contribution to the cognitive-linguistic study of temporal metaphor. Though the study is not typological, the author’s choice to examine and compare three different languages is a valiant step toward a more general and less language-specific understanding of the nature of temporal metaphor and the conceptualizations that underlie it. The detailed analysis of the causative TIME IS A CHANGER metaphors is likewise an innovation in a field that thus far has been mostly concerned with metaphors of time based on the source frame of spatial motion. Máthé’s study also combines the general and widespread metaphors of TIME IS A MOVER and TIME IS A CHANGER with the more language-specific, often quite idiomatic metaphors that are based on genitive constructions with ‘time’ as a modifier of another noun. As always, some critical remarks can be made of the work extending from the author’s choice not to include Kevin Moore’s work in the theoretical background, all the way to the representation of the results. In spite of such critical remarks, we find Máthé’s work to be an important step forward in the study of this extremely complex and fascinating field of linguistic expressions, as well as the conceptualization strategies that underlie and motivate them.

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