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Review

Metaphor as a cognitive facilitator in L2 vocabulary acquisition

Dexter Yim

The University of Oxford, Oxford, United Kingdom

Abstract

Vocabulary acquisition is a cognitive activity that poses a significant challenge to second language learners. Non-literal language, particularly metaphor, has long been recognized as a potent cognitive and linguistic tool for expressing and understanding abstract concepts, emotions, and experiences. However, some contend that learning non-literal language may impede L2 vocabulary acquisition. This research paper aimed to investigate the impact of metaphorical competence and metaphorical awareness on vocabulary acquisition in second language learners based on theoretical and empirical studies. It examined a few studies that demonstrated how metaphorical competence and awareness facilitate vocabulary acquisition, such as scaffolding learners' acquisition of word meanings and improving their vocabulary retention. The implications for L2 vocabulary research were discussed for future design, and pedagogical implications were proffered for educators.

1. Introduction

Vocabulary learning has become the focus in language acquisition (Schmitt, 1997) since it provides a solid foundation in understanding a language, either native or non-native. In the process of acquiring a language, it is sometimes difficult for learners to understand abstract and complex ideas as many of the ideas are constituted by metaphors, or the metaphorical relationship between two concepts. The metaphor "time is money" is an illustrative example, as it facilitates learners' comprehension of the abstract concept of time by establishing a link to the more concrete and universally understood concept of money. This enhanced understanding, in turn, can aid learners in effectively retaining and utilizing the words and concepts in their own communication. Therefore, the acquisition of metaphors provides a valuable means of comprehending and acquiring knowledge (Lakoff & Johnson, 1980). After Lakoff and Jonson published their book *Metaphors We Live By* in 1980, there has been more research on the effects of metaphors on L2 vocabulary acquisition because metaphors are a major cognitive and linguistic strategy for facilitating the comprehension of abstract concepts and vocabulary acquisition (Niemeier, 2017). Despite other non-literal language like idioms also appearing in our daily lives, idioms are based on metaphors (Gibbs, 1994) and the

ways to understand and acquire idioms are similar to that of metaphors – involving metaphorical extension. Moreover, more and more idioms like "lose one's head" become conventional (Schnell, 2007) and thus can be understood by their literal meanings. Therefore, when we discuss whether non-literal language facilitates or hinders L2 vocabulary acquisition, examining metaphors provides a broader view and is more representative and significant. Given that vocabulary learning is a cognitive activity (Hua, 2020), it is appropriate to analyze the impacts of metaphors on L2 vocabulary with reference to Conceptual Metaphor Theory (CMT). This paper will first define metaphor and introduce CMT, and review how conceptual metaphors benefit L2 vocabulary acquisition based on theoretical and empirical studies, thus drawing implications for both L2 vocabulary research and pedagogy from a cognitive linguistic point of view.

2. The presence of metaphors as a phenomenon and CMT

Metaphor is deemed a device for conceptualizing one domain of experience in terms of another (Lee, 2002); in other words, metaphor involves mapping one concept onto another in a way that deviates from the expected or core meaning of a particular word or phrase,

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and has conceptual association (Grady, 2007). For example, love is often metaphorized as a journey and a battlefield as we think that there are frequent changes in a relationship and that love is difficult. Lazar (1996) emphasizes that L2 learners can identify and use the metaphorical extension of words if they want to enlarge their vocabulary; such a metaphorical extension involves cognitive processes. By virtue of the cognitive nature of processing metaphors, CMT has been harnessed to provide theoretical foundation for facilitating L2 vocabulary teaching and learning.

CMT (Lakoff & Johnson, 1980) is a framework for understanding how metaphors are used in language and how they shape our thinking and understanding of the world. It explains that metaphors are not only linguistic expressions but also a cognitive tool for humans to elucidate the process of learning English words. In CMT, cross-domain mapping is the process of mapping the structure and attributes of a more concrete and experiential source domain onto a more abstract target domain. The source domain provides a conceptual and experiential basis for understanding the target domain. In other words, cross-domain mapping is a form of mental connection between the source domain and the target domain, and this process of mapping is of great help in the memorization of words and understanding their connotations, making vocabulary learning systematic (Hua, 2020).

Cognitively speaking, when acquiring vocabulary, the concept of the learning burden of a word, which is defined as the amount of mental effort required to learn a word, poses a threat to L2 vocabulary acquisition (Nation, 2001). Learners' prior knowledge and familiarity with related similar phonological and grammatical, semantic, and collocational terms in learners' L1 were found to be the most influential factor contributing to the learning burden. It could be significantly decreased by calling the attention of learners to systematic patterns, similarities, and links between their second and first languages (Nation, 2001). Therefore, by merging many elements of information into a single chunk in working memory, long-term memory knowledge structures enable humans to avoid processing overwhelming quantities of information and effectively remove the potential working-memory overload (Sweller, 2003). Table 1 shows some examples of source and target domains:

Table 1. Frames and Constructions in Metaphoric Language proposed by Sullivan (2013)

Source domain	Target domain
love	journey, argument, war
day	life
birth	dawn
sunny students	cheerful students

Metaphors enable learners to export the conceptual structure of the source domain to the more abstract target domain. Conceptualizing "sunny" as "cheerful" allows learners to activate the knowledge of the source domain and then map the various features of the source domain onto the aspects of the target domain. Learners can deduce the meaning of "cheerful students" from their perceptions of, or experiences of having of "a sunny day". In other words, knowledge about source domains can help learners increase their understanding of a foreign language. This mapping process, the awareness of the source domain, and the ability to metaphorically associate the ideas can facilitate vocabulary retention and acquisition (Boers, 2004).

After introducing CMT and the mechanism of processing metaphors, it is important to explore why and how metaphorical awareness and competence are conducive to L2 vocabulary acquisition with theoretical and empirical studies.

Metaphor is seen as a channelling device to comprehend, store, and reproduce figurative language input (Boers, 2004), but processing metaphors requires a lot of working memory, which is the primary conscious cognitive processor responsible for constructing and integrating mental representations and the short-term storage and maintenance of the relevant information. To ease learners' working memory, extending lexical relations with metaphors is effective (MacLennan, 1994), and thus more capacity can be released to deal with unfamiliar vocabulary and lengthen the retention of vocabulary (Pourdana, Sahebalzamani & Rajeski, 2014). However, there is a paucity of measurements to indicate learners' ability to process metaphors and gauge the effectiveness of metaphors in relation to L2 vocabulary acquisition.

3. Metaphorical competence and metaphorical awareness in relation to L2 vocabulary acquisition

To investigate how processing metaphor is beneficial to L2 vocabulary acquisition, different researchers (Boers, 2004; Kalyuga & Kalyuga, 2008; Littlemore, 2001) attempted to establish the linkage among metaphorical competence, metaphorical awareness and L2 vocabulary acquisition.

Littlemore (2001) defined metaphorical competence as a mix of four components: the originality of metaphor production, the ability to find meaning in metaphor, the speed at which one finds meaning in metaphor, and the fluency of metaphor interpretation. MacArthur (2010) explored the metaphorical language used by undergraduate students in their writing. The data indicated that students utilized metaphors to describe their views on complicated and abstract topics, but their metaphorical usage was not always conventional. Hence, she defined metaphorical competence as the ability to use their second language figuratively.

On the other hand, Boers (2004) deemed "metaphor awareness" as the ability to perceive the

ubiquity, underlying themes, non-arbitrary nature, cross-cultural variances, and cross-linguistic diversity of metaphorical expressions in language. Generally, the majority of studies indicate that more proficient L2 learners appear to possess higher metaphorical competence and awareness, which help them comprehend and remember vocabulary in an effective manner (Aleshtar & Dowlatabadi, 2014; Boers & Demecheleer, 1998, Littlemore, 2001; MacArthur, 2010).

The impact of English metaphorical awareness on vocabulary retention was examined by Pourdana, Sahebalzamani, and Rajeski (2014) in their study of 60 intermediate EFL learners in Iran, aged 16 to 20. The experimental group was exposed to and engaged in 20 minutes of English metaphorical awareness tasks, including matching, pictorial idioms, and poems, while the control group was given the vocabulary exercise from *New Cutting Edge* (Cunningham, Moor & Eales 2007), an English learning book focusing on task-based learning for pre-intermediate students. A statistically significant difference was found for the better performance of the experimental group in the post test. The results support that introducing new words and expressions in chunks based on shared metaphorically themed activities such as reading poetry and teaching verbal information through imagery can enhance learners' metaphorical awareness, thus facilitating vocabulary acquisition and recalling vocabulary in four language skills.

Another empirical study undertaken by Starr, Cirolia, Tillman and Srinivasan (2021) also obtained similar results showing that processing spatial metaphors can scaffold children's acquisition of word meanings, and higher metaphorical competence and awareness can allow these children to learn a novel adjective in the domain of space or pitch and to extend the adjective to the target domain. Boers (2000) also conducted his empirical study by testing intermediate English learners whose L1 is either Dutch or French in Belgium. The results consistently substantiate the hypothesis that a lexical organization along source domains can facilitate retrieval and retention of vocabulary (Boers, 2004). A statistically significance was found for the participants who had been encouraged to process metaphors in association with their source domains being more likely to reproduce them in active usage. In other words, enhanced metaphorical awareness can be turned into an additional channel for vocabulary acquisition because they can systematically expand on their prior knowledge and use already known words in extended senses. Later, Boers (2004) and Boers et al. (2004) also presented empirical evidence for the adoption of etymological elaboration to corroborate CMT arguing that learners are more likely to recall metaphorical expressions when they know about their origin than when they only know its meaning. This echoes Kalyuga's and Kalyuga's study (2008) that words that appear in language as a result of metaphorical extensions resemble other etymologically related

words. This method helps learners establish mental associations and speed up learning because learners' prior knowledge can assist in assimilating new information by reducing the burden on working memory.

Apart from the above-mentioned studies, the qualitative research undertaken by Liu and Hsieh (2020) also suggests that employing metaphors to develop learners' metaphorical competence and awareness is essential to L2 language acquisition. They adopted a multiple case study design to explore CFL learners' developmental processes of metaphorical awareness and competence regarding Chinese animal metaphors. Three Chinese-speaking university students from a public university in the United States took part in the study. Textual data, including presurvey results, writing assignments, and all the in-class work produced by the university learners, as well as audio recordings documenting the instructional sessions, were collected. The data revealed that all the participants showed an expanded metaphorical awareness in recognizing the commonalities and differences in the animal metaphorical expressions of their L1 and L2 cultures.

4. Implications for L2 vocabulary research

Given the importance of metaphorical competence and awareness and the mechanism of CMT, this paper attempts to proffer three directions for L2 vocabulary research and pedagogical implications based on the abovementioned research.

This paper focuses on conceptual metaphors, but there are other kinds of conceptual metaphors such as imagistic, orientational, ontological, and structural metaphors (Lakoff & Johnson, 1980) that might affect how learners process them in relation to their cognitive style, proficiency, first language, and culture. Most of the research analyzed in this paper does not categorize and examine a particular conceptual metaphor, except Starr, Cirolia, Tillman, and Srinivasan's research on spatial metaphors (2021); in Boers's study (2004), metaphorical language seems to be chosen selectively or randomly. The particular conceptual metaphor could have yielded different results, suggesting that some particular conceptual metaphors might hinder learners' understanding of L2 and demotivate them. Therefore, the four conceptual metaphors should be investigated independently in relation to learners of different proficiency levels and cognitive styles (Hawkins, 1998) because the styles impact learners' ways of metaphor interpretation (Johnson & Rosano, 1993) and speed of interpretation (Littlemore, 2001).

As for learners' proficiency, most of the participants in the research in this paper are intermediate learners (Boers 2000; Pourdana, Sahebalzamani & Rajeski, 2014) although Boers (2004) claims teaching metaphors tends to work best with intermediate students, since beginners lack the vocabulary and advanced students are risk-averse. As

the studies analyzed above focused on intermediate learners, and it is unclear whether the findings can be generalized to learners of other proficiency levels. Future research could investigate the effectiveness of teaching metaphors to beginners and advanced learners and compare the results to those of the intermediate learners.

The teaching order and the level of difficulty of conceptual metaphors should also be further explored because the cognitive burden exerted by different kinds of conceptual metaphors on working memory might be different. Therefore, researchers need to think of the questions when making pedagogical suggestions: should the four conceptual metaphors be introduced to L2 learners in different order? Should teachers consider learners' L1, and their cultural and linguistic background when teaching conceptual metaphors and designing the learning materials?

More longitudinal research should be conducted in the future because most of the participants (the experimental groups) in the abovementioned research received awareness-raising activities for a very short period of time. It stands to reason that a one-off learning experience is often not sufficient to turn metaphor awareness into a long-term strategy (Kalyuga & Kalyuga, 2008), and therefore the effectiveness of awareness-raising activities in relation to L2 vocabulary acquisition and time is worth exploring because metaphor awareness can only be fruitful in the long term (Boers, 2000).

5. Pedagogical implications

Teaching metaphors is difficult because teachers must consider various variables such as learners' proficiency, cognitive style, pedagogy, and learning materials, and there is a scarcity of metaphor-based instruction and learning materials. Research on metaphoric awareness emphasizes the metaphorical foundations of language and asserts that awareness-raising activities can facilitate vocabulary acquisition (Boers, 2004). This paper suggests a few methods for teachers' reference.

Kalyuga and Kalyuga (2008) suggest raising metaphor awareness by presenting vocabulary in metaphorical chunks in conjunction with activating learners' prior knowledge to reduce potential cognitive overload. It helps learners establish associations between the metaphorical expression and its more concrete senses, which can lead to a higher retention rate of vocabulary (Boers, 2000; Guo, 2007). For example, Niemeier (2017) designed the metaphor-based lesson about colour expressions and successfully helped the learners extend their use of already known colour-related vocabulary and store the expressions as meaningful units. When teaching metaphors, teachers can prepare more similar metaphors or other non-literal expressions and guide students to guess the meaning based on their L1 knowledge, metaphorical association. Also, teachers can ask students to discuss and compare metaphors in their native and target languages, as this can improve learners' metaphor comprehension and production (Deignan, Gabrýs & Solska, 1997) because L2 speakers often lack a native speaker's worldview, culture, and socialization and may consequently be incapable of comprehending metaphorical language (Niemeier, 2017). For instance, students can compare the metaphorical meaning of the colour "green" in Cantonese and English. Teachers can also consider instructing students to organize language into thematic groupings based on conceptual metaphors to enhance their ability to expand their vocabulary.

6. Conclusion

In summary, this paper argues that learning non-literal language is conducive to L2 vocabulary acquisition by compiling theoretical and empirical research on the benefits of learning conceptual metaphors from the CMT perspective and the implications of metaphorical awareness and competence (Littlemore, 2001; Boers, 2004; Kalyuga & Kalyuga, 2008; Starr, Cirolia, Tillman & Srinivasan, 2021). As learning vocabulary is a multifaceted process and research on metaphor in relation to L2 education and how other factors such as cognitive styles, age, proficiency, and the difficulty of different types of metaphors affect the effectiveness of metaphor-based learning are scant, this paper proffers directions for future research and metaphor-based instruction and materials design with reference to Niemeier's research (2017).

Dexter Yim is currently pursuing a master's degree in Applied Linguistics for Language Teaching at The University of Oxford. After completing his studies in English Literature at The Chinese University of Hong Kong, he continued his academic journey by studying a master's degree in creative writing and a PGDE (English Language Education) at The University of Edinburgh and The University of Hong Kong, respectively. With five years of experience teaching English in Hong Kong, his research interests include second language (L2) vocabulary acquisition, L2 motivation, language assessment, pedagogical approaches, and self-regulated learning.

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