

Applicability of technology-enhanced visual glosses for explicit L2 vocabulary learning: The enhancement of metaphoric competence through the learning of English polysemous words



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HIGHLIGHTS

- Examination of the efficacy of animated schematic image as visual gloss for explicit L2 vocabulary learning.
- Based on the hypothesis that the animated schematic images could facilitate better L2 text comprehension and production.
- No difference in learning effect between pictorial glosses and animated glosses in the text comprehension.
- Higher accuracy rate of the text comprehension with *over*, the most polysemous word in the target words.
- Significant difference was observed in producing sentences with metaphorical senses of the target words.

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ABSTRACT

This study examines the efficacy of technology-enhanced visual glosses in explicit L2 vocabulary learning based on the concept of the image schema, which is a mental pattern of our bodily experiences. Although our previous studies could not confirm the advantage of the animated visual glosses for acquiring English prepositions, this study reexamines the learning effect of the animated glosses; we assume that the animation, could enhance learners' comprehension and production of the target prepositions (especially in their metaphorical sense). The findings suggest that the animated visual glosses were only effect in certain scenarios. More specifically, the animated image schema was more a more effective gloss for students to produce metaphorical prepositions than for them to select the correct word in receptive tests. Thus this study therefore shows that when examining technology for L2 learning, more analysis of the features of the target L2 knowledge should be made.

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One of the primary goals of second or foreign language (L2) acquisition is to improve learners' comprehension of texts and discourse in the target language. In order to achieve this goal, L2 learners are taught various aspects of the target language, such as grammar and vocabulary. Since the 1990s, increasing attention has been paid to L2 vocabulary L2 learning; this is because learners' insufficient vocabulary has been consistently reported as a significant problem in their achievement of L2 proficiency [11,14,15,29,42]. Many studies, including computer-assisted language learning (CALL) research, have thus focused on how to most effectively learn L2 vocabulary (e.g., [6,28]).

Along with the Dual Coding Theory [38] in multimedia learning [37], which notes how representing information using verbal and visual codes can more effectively facilitate information recall of information than when using only one code, the efficacy of pictorial aids as visual glosses [35] in dictionaries and learning materials has been examined in CALL research. In fact, many studies conclude that the use of pictures as visual glosses can facilitate longer retention of target vocabulary (e.g., [1,7,19,27,35,48,49]). [5] noted the multimedia environment's advantage for input comprehension by stating that “[i]n material in which visualization, sequence, motion and/or trajectory were essential, the animated presentation strategy showed significant advantage over text-only. (p.100)”, thus demonstrating how visual glosses can facilitate increased information retention [27].

However, this study asserts that the findings of previous studies are not sufficiently robust to present a clear conclusion on the

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merits of technology-enhanced visual glosses for L2 vocabulary learning. First of all, the previous studies tend to give too much credit to technology in L2 learning and as a result, they ignore the linguistic differences of the target vocabulary. Although their conclusions seem to claim that technology-enhanced visual aids lead to successful learning of any vocabulary items, they do not mention the learning effect per their target vocabulary item. These studies' random selection of the target vocabulary might indicate their ignorance of the fact that some words are easier or more difficult to learn. Often, some words are easier to learn because each form has only one meaning, while other words are more difficult because they have multiple meanings that require the users to select the appropriate meaning for the given context. [11] pointed out that the type of vocabulary item or its semantic structure may affect its level of learning difficulty. The studies mentioned above did not examine such differences and instead rather roughly conclude that pictorial aids are effective in any setting.

Furthermore, they examined the effectiveness of visual glosses in terms of incidental vocabulary learning (e.g. Refs. [1,5,7,17,28,48,49,52]), this emphasis is based on the claim that most words are learned incidentally [16]. The participants in these studies, therefore, should use visual glosses not to understand the target words, but to understand the texts they read. [48]; for example, asked learners to read a narrative story on the Internet with verbal, visual, and both verbal and visual glosses and thereby illustrate which glosses could enhance retention of the target vocabulary learned incidentally. This research design indicates that the L2 learners did not use the visual glosses to understand the semantic features of the target words explicitly or intentionally. Therefore, the study's finding as well as other related studies shown above do not support visual glosses' effectiveness in learning certain vocabulary types explicitly.

Considering the limitations of previous studies focusing on computer-mediated visual glosses for incidental L2 vocabulary learning, this study focuses on the semantic features of the target vocabulary and therefore, the relevant theoretical perspectives from semantic research should be used in tandem with L2 vocabulary acquisition studies. In order to address the issue, this study takes up a theoretical framework from Cognitive Linguistics.

1. Application of cognitive linguistics in CALL research: image-schema

Cognitive Linguistics (CL) is the study of language as a cognitive function, that is, the study “to discover the ways in which linguistic structures are related to and motivated by human conceptual knowledge, bodily experience, and the communicative functions of discourse” [13]; p. 11). The most interesting claim of CL is that of the “embodiment of meaning” [53]. [22] also illustrated that our concepts are meaningful because they are embodied or rooted in our bodily experiences. Metaphor, which is one of the most important concepts of CL, plays a pivotal role in mapping our bodily experiences to abstract ideas that underlie our ways of thinking [13]. To conduct CL-based language analysis called usage-based model [25], many studies address prepositions [8,9,22,44,46,50] and conclude that words develop prototypical semantic categories which are related to bodily experiences and the categories can systematically extend into abstract ones [12,22,25].

Furthermore, CL highlights how the patterns of our bodily experiences can serve as crucial mediators between language and concept, as well as facilitating metaphorical mappings from our bodily experiences to abstract domains [18]. Such patterns are called a schema [18,21,22,25]. [26] speculated that all the members of a category (such as meanings of a word) are conceptually motivated by a certain schema. This is because the schema is an

instantiation of a prototypical member created by conceptualizing our bodily experiences, which could then motivate non-prototypical members (such as figurative senses of a word). Due to how all members of a category are systematically connected to the schema, the schema could help people understand both the literal and the figurative meanings. The process of polysemous network is illustrated in Fig. 1 [26]:

Considering the CL-based polysemous network that all meanings can be conceptually motivated by the schema and how figurative meanings are vital for L2 learners' understanding [36]; as cited in Ref. [33], I hypothesize that the schema can be utilized as a pedagogical device to aid L2 learners' comprehension of the target vocabulary semantic network, as well as to understand and produce both the physical and figurative expressions of a word.

This study, which focuses on visual glosses, addresses the abstract representations of our bodily experiences [24] called the image schema [22], which is the core image of a word that connects it to a spatial concept [10]. [18] also defined image schemata as “abstract patterns in experience and understanding that are not propositional” (p. 2).

Fig. 2 depicts a prototypical image schema called above-across schema [22]; a moving object (TR: trajector) is located at the vertically upper side of another object (LM: landmark), which is a typical spatial relationship expressed by the preposition *over*. The image schema is intended to cover all the meanings the word has, although each meaning appears to be different.

2. Polysemous words

In this sense, what word type should be learned using the schematic image? As shown in the previous CL studies analyzing the semantic structure of prepositions, an image schema can actively organize extended examples of polysemous words that involve several physical (or literal) and figurative (or metaphorical) senses, due to the special problems they pose for EFL learners. Common examples of polysemous words include not only prepositions but also several verbs (e.g., *break, take, bring, get*).

[32] demonstrated the importance of polysemous words in L2 vocabulary learning. First, polysemous words are very frequently used in many types of contexts. Secondly, the words referring to positional relationships are important and finally, prepositions are one of the most typical polysemous word types and are used to construct and express many important concepts. However [31], argued that learning L2 spatial polysemous words involves some problems, which he presumes to stem mainly from learners' perceptions. They are likely to think that spatial polysemous words are highly idiomatic and very often delexical, which means they are not the content words with any significant meanings. Therefore, a better way to learn how to use them naturally has to simply memorize as many set phrases as possible in their appropriate contexts. However, this study emphasizes that such rote learning results in learners' failure to appropriately use spatial polysemous words. The complexity of their semantic networks makes them

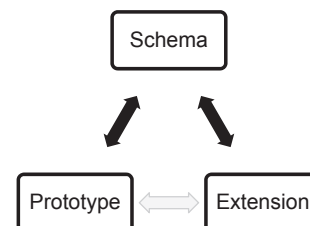


Fig. 1. The process of extension [26]; p. 271).

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