



Expanding Vocabulary Comprehension and Production Through Metaphor Awareness: A Case of Iranian EFL Learners

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ARTICLE INFO:

Received date:

2026.02.18

Accepted date:

2026.05.21

Print ISSN: 2251-7995

Online ISSN: 2676-6876

Keywords:

Metaphor Awareness,
Vocabulary Learning, Foreign
Language, Production,
Comprehension



Abstract

The seemingly arbitrary nature of word meanings has long hindered the development of effective channels for vocabulary learning in a non-native language. This study compares enactment-based and explanation-based instructional methods in raising learners' awareness of metaphorical motivation behind a set of word meanings, and their subsequent effect on medium-term retention and long-term reproduction of figurative senses. A convenience sample of 60 EFL students were divided into two groups. Subsequently, they underwent metaphor awareness training in which the researcher provided either physical enactments or verbal explanations. In addition to administering pretests, two delayed posttests were conducted to assess the comprehension and production of the target words at one-week and one-month intervals, respectively. Overall, the instruction based on teacher-centered verbal explanations showed significant improvements in participants' receptive and productive knowledge of the words in their metaphorical senses. Likewise, the implementation of enactment-based activities yielded significant improvements in their comprehension and production of the metaphorical uses of the words. Further analysis indicated that whereas physically enacting the literal senses of the words was more effective for their metaphorical comprehension, the intervention based on verbal explanations had a significantly stronger effect on their reproduction.

Citation: Al-Dirawi, A. & Rafiee Fazel, A. (2026). Expanding Vocabulary Comprehension and Production Through Metaphor Awareness: A Case of Iranian EFL Learners. *Journal of English Language Teaching and Learning*, 18 (37), 213-228. DOI: 10.22034/elt.2026.71522.2853

Introduction

Traditional vocabulary teaching methods, which rely heavily on rote memorization, have been challenging for many language learners in internalizing new words, understanding metaphorically rich texts, and expressing complex ideas in a vivid and captivating way. To address these issues, highlighting the semantically motivated, metaphorical aspects of words offers an effective alternative strategy for vocabulary teaching and learning purposes (Boers, 2000).

A key claim in cognitive semantics is that the nonliteral meanings of some everyday words are motivated by our sensorimotor experiences rather than being entirely arbitrary (e.g., Gibbs, 1994; Johnson, 1987; Lakoff, 1987). This view holds great promise for incorporating a focus on conceptual metaphors into the second language (L2) classroom. Accordingly, there are growing calls for further research on raising learners' awareness of metaphors instantiated by such words that are deeply embedded in language.

This study seeks to compare the relative effectiveness of two instructional methods—enactment-based and explanation-based—on enhancing awareness of the conceptual metaphorical underpinnings of English words. Specifically, Iranian English as a foreign language (EFL) learners' ability to comprehend and produce a set of words motivated by the “up–down” orientation is examined over the medium and long terms, respectively.

Literature Review

Theoretical Frameworks

Conceptual Metaphor Theory

Lakoff and Johnson's (1980) call for an experientialist approach to cognition revolutionized our understanding of metaphor by disputing the view that they are merely decorative elements of literary language. Instead, these scholars contended that metaphors are intrinsic components of our everyday conceptual system. As a fundamental aspect of human cognition, metaphors enable us to make sense of abstract concepts by mapping them onto the attributes of more concrete domains. These concrete conceptual domains are grounded in our bodily interactions with both the physical and cultural environment around us. For example, the metaphorical linguistic expression “This relationship is a *dead-end street*” illustrates the notion of love as a journey. The conceptual metaphor LOVE IS A JOURNEY maps certain features of a journey (source domain) onto the concept of love (target domain). In other words, we conceptualize love in terms of a journey, with constituent elements such as travelers, obstacles, and destinations (Kövecses, 2010).

In the initial formulation of conceptual metaphor theory, Lakoff and Johnson (1980) proposed a tripartite distinction among structural, ontological, and orientational metaphors. Structural metaphors enable individuals to conceptualize a target concept in terms of the knowledge structure provided by the source domain. In the LOVE IS A JOURNEY conceptual metaphor, the concept of love is metaphorically structured in terms of the concept of a journey. Unlike structural metaphors, ontological metaphors provide limited cognitive structuring; they assign target concepts only a new ontological status, thereby creating new abstract entities. Personification, for example, can be understood as a type of ontological metaphor (e.g.,

“Inflation is *eating up* our profits”). Orientational metaphors provide even less conceptual structure for abstract concepts than ontological metaphors do. Their cognitive function is to map spatial orientations (i.e., up–down, front–back, in–out, and center–periphery) onto target-domain concepts. For instance, the upward orientation is commonly associated with the concept of more (e.g., MORE IS UP; “Speak *up*”), whereas the downward orientation is typically associated with the concept of less (e.g., LESS IS DOWN; “Keep your voice *down*”).

Embodied Cognition Thesis

Metaphor has been recognized as a deeply embodied aspect of human cognition (see Gibbs, 2005; Lakoff & Johnson, 1999). Unlike traditional views of meaning in terms of mental representations or definitions, abstract thought has been argued to be experientially grounded (Littlemore, 2023). This is exemplified by a more fundamental type of metaphor—primary metaphors (Grady, 1997)—which have their experiential bases in the physical interactions of our bodies with the world (Gibbs, 2005). In the metaphors previously cited, spatial concepts such as “up” and “down” project our physical experiences with gravity onto abstract domains. According to the proponents of this thesis, the production or perception of such metaphors activates corresponding mental representations of our sensorimotor experiences in the brain (Barsalou, 2008; Gibbs, 2015). Therefore, we tend to understand abstract concepts in terms of our everyday experiences (i.e., embodied simulations).

The theory of image schemas offers a compelling framework for articulating the central tenets of the embodied cognition hypothesis. According to this cognitive linguistic theory, image schemas emerge directly from our perceptual engagements with the world (Johnson, 1987). These include, among others, our encounters with physical forces (e.g., walking against the wind, referred to as “FORCE schemas”), our interactions with physical objects (e.g., containers with objects inside or outside them, referred to as “CONTAINER schemas”), and our experiences of spatial relations (e.g., up–down orientation, referred to as “SPACE schemas”; see Evans & Green, 2006, for a complete list). Such recurring patterns serve as organizing frameworks that structure a wide range of abstract concepts metaphorically (Kövecses, 2010). For example, various emotional states can be structured in terms of schemata such as HAPPY IS UP and SAD IS DOWN, resulting in metaphoric extensions like “She’s feeling *up* today” and “He’s really *low* these days.” It should be noted that although embodiment is not the exclusive basis for all language processes, it remains a fundamental component of the cognitive mechanisms through which we derive meaning from basic bodily experiences.

Empirical Studies

In recent decades, several scholars have sought to incorporate metaphoric thinking into instructional materials and pedagogical practices. This type of mental elaboration can be achieved through verbal and/or nonverbal metaphor awareness-raising activities. A substantial body of evidence now illustrates the far-reaching benefits of enhancing learners’ awareness of conceptual metaphors (e.g., Boers, 2000; Saaty, 2020; Yasuda, 2010; see Lindstromberg & Boers, 2005; see also Zhou et al., 2022, for a meta-analytic review). These studies converge on the view that metaphor-based teaching interventions can effectively develop L2 vocabulary

knowledge, particularly in terms of the comprehension, production, and retention of novel lexical items.

Metaphor Production

One of the experiments reported by Boers (2000) examined the effect of enhanced metaphor awareness on learners' ability to recall and reproduce newly learned words. This study involved 73 university students, aged 19–20 years, all majoring in business and economics. The participants were native French speakers with intermediate proficiency in English. They were given a list of English expressions illustrating the orientational metaphors MORE IS UP and LESS IS DOWN, which they used to describe upward and downward economic trends. In the experimental group ($n = 40$), students' attention was directed to the source domains of the words (e.g., "plunge" evokes the image of diving, whereas "creep up" evokes that of mountain climbing). In contrast, the control group ($n = 33$) was encouraged to focus on the pragmatic functions of the same words (e.g., "plunge" indicates a rapid change, whereas "creep up" indicates a gradual change). After reviewing the list for 10 min, participants were asked to write a short essay interpreting a number of graphs on unemployment rates. Notably, the task was disguised as a revision exercise on tenses (i.e., past, present, and future economic trends).

In the immediate posttest, participants prompted to associate the figurative items with their source domains were significantly more likely than the control group to use them in their written descriptions. This suggests that learning vocabulary through imagery processing enhances learners' lexical knowledge in the target language.

Results from Boers's (2000) early study, although informative, could have been more insightful, had a pretest been administered. In fact, this investigation did not control for the participants' prior knowledge of the target words. Furthermore, this experimental set-up was merely meant to draw the participants' attention to the source domains, predicting that imagery would be applied in their processing of the figurative lexis. Beyond this 10-min instruction session, no further attempt was made to increase their metaphor awareness through a more explicit focus. This can in part explain why the experimental group performed no better than the control group when followed up one year later (Boers, 2004).

Metaphor Comprehension

Lindstromberg and Boers (2005) conducted a study to examine the effect of enactment- and mime-based instruction on learners' acquisition of English manner-of-movement verbs. As part of this study, 62 Dutch university students majoring in English (aged 21–22 years) were divided into an experimental group ($n = 27$) and a control group ($n = 35$). They were presented with a set of 24 enactable verbs, each with both literal and metaphorical senses. Participants in the enactment group took turns miming the basic senses of the verbs for their peers to guess which verb was being acted out (e.g., "to hurl stones"), whereas those in the control group conveyed the meaning of the words using only verbal explanations. An immediate gap-fill test was subsequently administered to assess short-term retention of the verbs' literal meanings. On this test, the experimental group recalled the literal senses significantly better than those who had learned them through verbal definitions. Interestingly, the participants who enacted or explained the verbs themselves exhibited higher recall rates than those who merely attended to

their demonstrations or explanations. Moreover, enacting a verb resulted in even better retention than verbally explaining it.

In a delayed posttest conducted one week later, the participants were asked to evaluate the quality of Dutch translations of English sentences in which the same verbs were used metaphorically (e.g., “to hurl reproaches”). The results showed that the students in the miming condition were significantly more likely to detect imprecisions in the translations. Lindstromberg and Boers (2005) concluded that motoric imagery facilitated this group’s ability to transfer their enhanced understanding of the literal senses of the verbs to a deeper appreciation of their metaphoric extensions.

The translation task in the delayed posttest was administered to measure the participants’ comprehension of the metaphorical uses of the manner verbs. Yet, the study employs no language production task to provide data on their ability to use the verbs metaphorically in more active usage.

Metaphor Comprehension and Production

Building on the previous studies, Saaty (2020) investigated the effectiveness of an enactment-based approach in raising learners’ awareness of the embodied nature of the conceptual metaphor LIFE IS A JOURNEY. Eleven metaphoric expressions—including verbs, nouns, multiword units, and collocations—were selected for their figurative and literal relations to the conceptual metaphor in question. The participants were 60 Saudi female EFL students, aged 18–20 years. They were assigned to three groups: the enactment metaphor group ($n = 25$), who mimed the meanings of the target expressions using Total Physical Response (TPR) commands; the conceptual metaphor group ($n = 18$), who learned the same expressions through the Presentation–Practice–Production method; and the control group ($n = 17$), who studied the items solely as figurative expressions under semantic clusters, without addressing their conceptual motivations. The participants’ understanding of the expressions was assessed using multiple-choice metaphor comprehension tests at three occasions: a pretest, a posttest, and a two-week delayed posttest. The metaphor production pretest and posttest consisted of free-writing tasks designed to elicit the figurative use of the expressions.

Analysis of group differences in metaphor comprehension gains revealed significant improvements from the pretest to both the posttest and the delayed posttest across groups. Pairwise comparisons revealed significant differences between the control group and the conceptual metaphor group, as well as between the control group and the enactment metaphor group. These findings corroborate previous research showing that raising learners’ awareness of the metaphorical motivation behind meaning extensions facilitates deeper comprehension. Notably, the enactment-based metaphor awareness intervention produced stronger mnemonic benefits in terms of the longer-term retention of the figurative senses. However, the results of the metaphor production test showed no significant differences among the three groups in the productive use of the expressions.

There is a possibility that the free-writing tasks designed to promote productive use of the taught expressions was unsuccessful in yielding positive results. As acknowledged by Saaty (2020), there was in fact no guarantee that the writing topics could reliably elicit free production

of the targeted metaphoric expressions. In addition, the study did not assess metaphor production beyond two weeks. Given that most models of vocabulary acquisition view active vocabulary to be at the endpoint of the lexical knowledge continuum (e.g., Nation, 2001/2013, as cited in Saaty, 2020), the assessment of productive knowledge over two weeks postintervention could have offered a more accurate picture of the impact of enactment-based metaphor awareness.

The Present Study

Although a number of studies have exploited metaphor awareness-raising activities in promoting vocabulary learning, several research gaps remain to be addressed. First, there have been relatively few attempts to measure the effect of enactment-based awareness-raising activities on metaphorical usage of words. Second, the results of previous studies remain largely unclear as to the possible effect of such an approach on the production of metaphoric language. Third, more systematic research is needed to examine long-term benefits of various awareness-raising activities for the production of metaphorically used words. Finally, in view of the evidence supporting the advantages of different metaphorical instructional interventions for vocabulary development, a comparison between them would yield valuable insights into their differential impact and practical application in the language classroom.

The current study therefore compares the relative effectiveness of enactment-based and explanation-based instructional techniques to metaphor awareness. To this end, the researchers examine EFL students' performance on the comprehension and production of a set of English words, which are metaphorically motivated by the "up-down" orientation, at different time intervals. This comparative study provides insights into the extent to which such a cognitive linguistic approach can be harnessed to structure L2 vocabulary teaching.

Method

Participants

Sixty Persian-speaking EFL students from the University of Kashan voluntarily took part in this study. They were adults aged 19–29 years ($M = 21.6$, $SD = 2.4$), with nine men in the sample. The students were selected nonrandomly using convenience sampling. They majored in English language and literature, English translator training, and English language teaching. The participants were divided into two parallel, nonrandomly assigned groups ($n = 30$): an enactment metaphor group (EMG) and a conceptual metaphor group (CMG).¹ Of the initial sample, data from seven participants were excluded from the final analysis: four participants were temporarily absent, two refused to continue, and one was removed for not following the instructions during the assessment tasks. Consequently, 25 participants remained in the CMG, and 28 participants remained in the EMG. Written informed consent was obtained from all participants prior to data collection, and they received course credit in exchange for their participation.

Design and Materials

The present study employed a quasi-experimental nonequivalent comparison group design. While the teaching methods (i.e., enactment-based vs. explanation-based metaphor awareness raising) served as the between-subjects independent variable, participants' comprehension and

production scores on one-week and one-month delayed posttests, respectively, were the dependent variables.

The researchers selected a set of common English words whose meanings are metaphorically motivated by the “up–down” spatial orientation (i.e., “soar,” “surge,” “creep (up),” “mount,” “slump,” “collapse,” “sink,” and “slide”). In doing so, care was taken to choose those lexical items with transparent basic senses. In the initial set of words, the motion verbs that could not be mimed in a relatively straightforward manner were excluded (e.g., “plunge” and “skyrocket”). This manageable number of the target words also helps ensure participant attention to the TPR commands. Dictionary definitions of both the literal and metaphorical meanings of the words, together with their usage examples, were included in a six-page handout prepared for the training and practice sessions. A sample of the dictionary definitions and usage examples for the words “soar” and “slump,” derived respectively from the conceptual metaphors MORE IS UP and LESS IS DOWN, is presented in Table 1 (see Appendix).

Table 1. *Dictionary Definitions and Usage Examples for “Soar” and “Slump”*

Word	Literal sense	Metaphorical sense	TPR command
RAPID RISE IS FLYING HIGH			
Soar (v)	(Of a bird or aircraft) to rise or fly high in the air <i>Planes soared overhead.</i>	To increase quickly in amount, number, value, or level <i>House prices soared a further 20 percent.</i>	Stand upright and then move your arms up and down quickly as if you were a bird flapping its wings.
RAPID REDUCTION IS SUDDEN PHYSICAL FALLING			
Slump (n, v)	To sit or fall heavily and suddenly <i>She slumped into the chair, exhausted.</i>	To fall suddenly in price, amount, or value <i>Home computer sales slumped dramatically last year.</i> A fall in the price, value, sales, etc. of something <i>There's been a slump in the demand for new cars.</i>	Suddenly, fall limply onto a chair and lean back.

Note. Definitions and usage examples were adopted from the *Cambridge Dictionary*.

The two groups were assessed before and after the teaching sessions using a production pretest, a comprehension pretest, a delayed comprehension posttest, and a delayed production posttest. The pretests were administered to ensure that the groups were on equal footing with respect to the target vocabulary items. To conceal the precise purpose of the study, the production pretest was designed as a sentence-building quiz. It comprised a scrambled list of 16 words, with the eight target words embedded among eight filler words. On the other hand, the comprehension pretest consisted of multiple-choice questions. It comprised eight items illustrating the use of each target word in its metaphorical sense and four filler items containing other words with either upward or downward meanings. The response options consisted of three incorrect answers, one correct answer, an option for an alternative meaning, and an option indicating a lack of knowledge.

To assess the medium-term retention of the words' metaphorical meanings, a delayed comprehension posttest was administered to the participant groups. This test was also designed as a multiple-choice assessment. However, the response options for "It means something else" and "I don't know" were omitted. To minimize threats to internal validity, the pre- and posttests were matched for comparable vocabulary difficulty.

The assessment of participants' productive vocabulary knowledge in the delayed posttest comprised two tasks: a fill-in-the-blank task and a graph description task. In the former test, they were required to write an appropriate word to fill in each blank (e.g., "When the secretary lost his job, he into deep despair."). Notably, the participants were not restricted in their choice of responses as each blank could be completed not only with the previously studied lexical items but also with other collocated words. For instance, the aforementioned test item could be answered either with the word "sank," one of the target words, or with the word "fall," which was not among the taught words.² The description task was designed to elicit the lexical items that the participants had studied. They were provided with four different line graphs, each depicting a specific trend (i.e., a sharp upward slope, a sharp downward slope, a gradual upward slope, and a gradual downward slope). Figure 1 illustrates a sharp upward trend in a line graph.

1. Annual expenditure on extracurricular activities by a school in France over a two-year period from 2001 to 2003

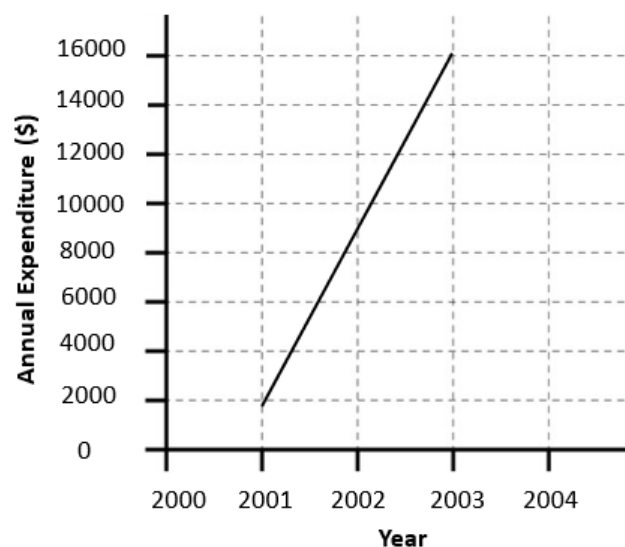


Figure 1. An Example of a Line Graph in the Delayed Production Posttest

Procedure

Inspired by Saaty's (2020) experimental setup, this study included four teaching sessions and four testing sessions over a 10-week period.

Teaching phase

This phase was conducted over four weekly sessions, each held at the same time and delivered by the same instructor (the first author). The two groups received an equivalent amount of training time (four 15-min sessions) and identical teaching materials (eight lexical items), but they underwent different treatments.

The EMG participants learned the associations between the literal and metaphorical senses of the words through simple TPR commands. The instructor demonstrated the literal meanings of the words through enactment using TPR activities. Meanwhile, participants' attention was drawn to specific aspects of the metaphorical senses (e.g., upward or downward trends and sharp or gradual slopes). For example, to demonstrate the word "soar," the instructor stood upright with his rib cage *lifted* and moved his arms *rapidly* up and down. Follow-up practice activities included (a) inferring the metaphorical senses from the instructor's TPR pantomimes, (b) recognizing the metaphorical senses in various sentence contexts, and (c) producing meaningful sentences using each word.

The Presentation–Practice–Production teaching method was employed to enhance metaphor awareness among the CMG participants. During the presentation phase, the instructor explained and compared the literal and metaphorical senses of each target word in meaningful sentence contexts. The participants were then encouraged to infer the relationship between the source and target domains. The practice phase involved (a) reading sample sentences to recognize the metaphorical uses of the words and (b) inferring their metaphoric themes (source domains). In the production phase, they were asked to construct short or long sentences using the target words.

Testing phase

A production pretest was administered to both groups two weeks before the treatment to evaluate their ability to actively use the target words in their figurative senses. Using a sentence-building quiz, participants were asked to construct one grammatically correct sentence for each item. They were informed that the study focused solely on evaluating their sentence-making skills; therefore, they could produce either short or long sentences as long as the sentences were meaningful. Each participant took approximately 15 min to complete the test; no feedback was provided.

One week before the treatment, a comprehension pretest was also administered to assess participants' prior knowledge of the words in their metaphorical senses. They read each sentence and selected the option that best described its overall meaning. The test lasted almost 10 min.

One week after the teaching sessions, the two groups were given an unannounced delayed comprehension posttest to assess the medium-term retention of the words in their metaphorical senses. Participants required approximately 10 min to complete the test.

Four weeks following the instructional phase, the productive use of the vocabulary items was measured in the delayed production posttest. The participants were asked to write descriptions of line graphs illustrating various types of upward and downward trends. The test also included a fill-in-the-blank task that required them to provide an appropriate target word for each blank. They were instructed not to repeat the lexical items across the subtests but to use semantically similar words in the appropriate contexts.³ Overall, they required no more than 20 min to complete the tasks.

Results

The data were analyzed using R (Version 4.0.4). Table 2 presents the summary statistics for each treatment group.

Table 2. *Descriptive Statistics for Pre- and Delayed Posttest Scores*

Assessment	CMG				EMG			
	Max	Min	M	SD	Max	Min	M	SD
Pretest								
Comprehension test	7	0	2.68	1.79	5	0	1.85	1.53
Production test	4	0	0.88	1.16	2	0	0.46	0.63
Delayed posttest								
Comprehension test	8	2	5.6	1.87	8	3	6.10	1.47
Production test	7	0	3.72	1.90	6	0	2.53	1.83

Note. CMG = conceptual metaphor group; EMG = enactment metaphor group.

Between-Group Comparisons of the Pretest Scores

The assessment of participants' comprehension of the words in their metaphorical senses indicated mean accuracy scores of 2.68 and 1.85 (out of 8) for the CMG and EMG, respectively.⁴ No significant difference in median scores was found between the two groups, as indicated by the Wilcoxon rank-sum test (Mann–Whitney U test; $W = 440.5$, $p = .103$).⁵ The effect size, computed as a rank-biserial correlation, was also small ($r_{rb} = 0.26$). On the other hand, the mean scores for the productive knowledge of the words were 0.88 and 0.46 (out of 8) for the CMG and EMG, respectively. This suggests that neither group actively used all of the words in their figurative senses. A comparison of these scores revealed no statistically significant difference between the groups ($W = 401.5$, $p = .305$, $r_{rb} = 0.15$).⁶ Figure 2 illustrates a comparison of the data obtained at different testing times.

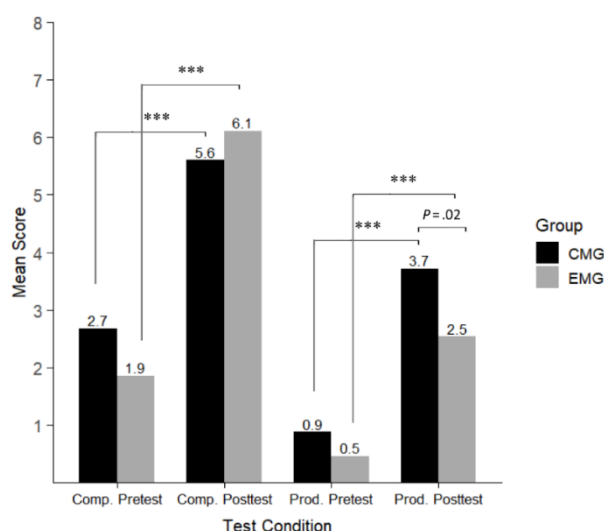


Figure 2. Comparison of Receptive and Productive Word Knowledge Over Time

Note. EMG = enactment metaphor group; CMG = conceptual metaphor group.

*** $p < .001$.

Within-Group Comparisons of the Test Scores Over Time

Results of the delayed posttest, administered one week after the treatment, indicated that the CMG achieved a mean receptive vocabulary score of 5.6. Meanwhile, participants in the EMG achieved a slightly higher mean score of 6.10. Subsequently, two-tailed paired-samples t -tests were conducted to assess mean differences between the pretest and posttest scores. Significant improvements in the participants' receptive knowledge of the target words were observed in both groups (CMG: $t_{(24)} = 6.32$, $p < .001$, $d = 1.27$; EMG: $t_{(27)} = 10.88$, $p < .001$, $d = 2.06$). However, the EMG showed a greater improvement, as reflected by a larger effect size compared with the CMG. These results suggest the effectiveness of the employed instructional interventions in enhancing the medium-term retention and comprehension of the metaphorical word meanings.

Results from the delayed posttest, administered four weeks after the intervention, revealed that the CMG attained a mean score of 3.72 in the production of metaphorically used words. The Wilcoxon signed-rank test (two-tailed) indicated a statistically significant change in their performance from pretest to posttest ($V = 292$, $p < .001$), with a maximum effect size ($r_{rb} = 1.00$).⁷ Despite demonstrating improvement, the EMG obtained lower scores on this test ($M = 2.53$). Likewise, a two-tailed paired-samples t -test indicated a highly significant difference between their pretest and posttest scores ($t_{(27)} = 5.64$, $p < .001$), with a large effect size ($d = 1.07$). These findings suggest that the experimental treatments had a notable positive effect on the long-term reproduction of the target lexical items in their metaphorical senses.

Between-Group Comparisons of the Test Scores Over Time

A comparison of the groups' delayed comprehension posttest scores revealed no statistically significant difference ($W = 301.5$, $p = .383$, $r_{rb} = -0.14$).⁸ In fact, the metaphor awareness-raising interventions delivered in this study did not appear to have a differential impact on the

medium-term retention of the words. Conversely, a two-tailed independent-samples *t*-test revealed a significant difference between the two groups' delayed production posttest scores ($t_{(51)} = 2.30, p = .025$), with a medium effect size ($d = 0.63$). Although both groups demonstrated substantial improvements in their productive use of the words, the CMG exhibited a more pronounced treatment effect that was sustained four weeks after the instructional phase.

Discussion

This study examined the comparative effectiveness of explanation-based and enactment-based instructional interventions on enhancing L2 learners' awareness of the metaphoric themes underlying figuratively used words. Subsequently, improvements in the comprehension and production of the words were assessed at medium- and long-term intervals, respectively.

In comparing the effect of metaphor awareness training methods on the ability to comprehend the words in their figurative senses, the results demonstrated significant gains in both groups. Several factors may jointly explain why lexical resources can benefit from enhanced metaphor-awareness instruction. Among these factors is the observation that knowledge of metaphoric themes provides a framework for lexical organization and promotes deep cognitive processing through the formation of imagery (Boers, 2000). Most importantly, the instructional effectiveness of this metalinguistic knowledge should be taken into consideration (Yasuda, 2010).

What is noteworthy is the greater improvement observed in the receptive vocabulary knowledge following the implementation of enactment-based metaphor awareness-raising activities. Saaty (2020) also found that an enactment-based approach yields stronger mnemonic benefits over the long term. Such superior retention rates may be attributed to the greater cognitive effort—and thus perhaps deeper levels of processing—invested in decoding the word meanings while observing someone enact them. In line with Paivio's (1986) dual coding approach, it can be argued that the motoric imagery evoked by the physical demonstration of the actions could have created an additional pathway for in-depth learning (Lindstromberg & Boers, 2005). Accordingly, Lindstromberg and Boers (2005) underscore the role of motoric dual coding, which is triggered by the neurological mirroring that occurs when actions are observed (e.g., Fadiga et al., 1995).

Boers (2000) found that an enhanced metaphor awareness significantly increased learners' likelihood of reproducing figurative expressions. In the present study, the comparison of the two instructional interventions also suggested an improvement in learners' production of the words over an extended period. Contrary to the greater receptive vocabulary gains observed in the enactment condition, metaphor-based instruction through verbal explanation was more effective in facilitating the long-term reproduction of the words. Had the participants enacted the word meanings themselves, higher production rates would have been expected. Given the richer stimulation of motoric imagery, it is plausible to expect that having participants mime the verbs engages deeper processing than merely attending to their demonstration or explanation (Lindstromberg & Boers, 2005; Schmitt, 2000). Nevertheless, it is essential to consider learners' cognitive style profiles and their influence on the development of metaphoric competence (e.g., Boers et al., 2008; Littlemore, 2001).

A number of limitations in this study provide opportunities for future research, notably the need for replication. First, the possibility that enactors may be able to reap the full learning benefits of this metaphor-awareness strategy warrants further investigation and refinement. Second, the results do not offer insights into which psychological profiles (e.g., levels of motivation), cognitive styles (e.g., verbalizers vs. imagers), or demographic characteristics (e.g., gender differences) benefit most from such instructional methods. Third, the small sample size, the gender imbalance, and the lack of baseline proficiency data limit the generalizability of the results. Fourth, including control groups in future studies would help establish stronger causal inferences regarding the two instructional interventions. Lastly, further pedagogy-oriented cognitive linguistic research should examine whether more longitudinal interventions influence the learning outcomes. Given these considerations, the present findings should be interpreted as suggestive, or at best indicative, rather than conclusive.

Conclusion

In sum, the comparison of the employed instructional methods suggested significant improvements in participants' metaphorical comprehension and reproduction of the target words over the medium and long terms, respectively. However, although greater receptive gains were observed following the enactment-based instruction, learners subjected to the teacher-centered verbal explanations exhibited more notable improvements in their reproduction of the target vocabulary. Overall, a focus on the cognitive linguistic view of metaphor in language teaching syllabi, coupled with learner engagement in additional metaphoric thinking, fosters a more dynamic and supportive learning environment. This can encourage learners to use conventional figurative language and can contribute to the internalization of new lexical items.

Acknowledgments

The authors thank all participants who voluntarily took part in this study, which constituted the first author's master's thesis at the University of Kashan (supervisor: ARF). Our sincere thanks are also due to the two anonymous reviewers for their insightful suggestions and helpful comments on an earlier draft of this paper.

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Notes

- ¹ Given the evidence supporting the effectiveness of the awareness-raising techniques under study, the absence of a control group does not preclude comparisons between the two conditions.
- ² The same applies to the other test items (i.e., “My spirits *raised/soared* when I heard the good news”; “His anxiety *increased/mounted* as messages were left unanswered”; “Atomic bombings led to the *decline/collapse* of the real estate market”).
- ³ Any repetition of a given word in the graph description and fill-in-the-blank tasks was counted as a single occurrence (i.e., one score).
- ⁴ Since the mean score for the CMG was 0.83 higher than that of the comparison group, this head start could possibly skew the results. Hence, some caution is in order, particularly given the limited number of words and participants included in this study.
- ⁵ The Shapiro–Wilk test indicated that the CMG data did not significantly deviate from normality ($p = .184$), whereas the EMG data revealed a significant departure from normality ($p = .015$).
- ⁶ Because the data from both groups violated the assumption of normality ($ps < .001$), the Mann–Whitney U test was conducted.
- ⁷ As the Shapiro–Wilk test indicated that the normality assumption was not met for the CMG ($p = .045$), the Wilcoxon signed-rank test was conducted.
- ⁸ Given the non-normal distribution of the EMG data ($p = .011$), the Mann–Whitney U test was conducted.

Appendix

List of Experimental Items

The target words each instantiate one conceptual metaphor, as follows:

MORE IS UP

“soar” (v):

RAPID RISE IS FLYING HIGH

“surge” (n, v):

SUDDEN INCREASE IS POWERFUL MOVEMENT FORWARD

“creep/creep up” (n, v):

PROGRESSIVE GROWTH IS CRAWLING UPWARD

“mount” (v):

GRADUAL INCREASE IS CLIMBING UP

LESS IS DOWN

“slump” (n, v):

RAPID REDUCTION IS SUDDEN PHYSICAL FALLING

“collapse” (n, v):

SUDDEN FALL IS PHYSICAL BREAKDOWN

“sink” (v):

PROGRESSIVE DECLINE IS SUBMERGENCE

“slide” (n, v):

GRADUAL DECREASE IS DOWNWARD MOTION OVER A SURFACE