

**Being Aware is not Enough: Learning Metaphor  
and Metonymy through Cognitive-oriented Methods**

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**Abstract**

Researchers contend that learners' awareness of linguistic motivations is the key to second language acquisition, and so is to figurative language learning. One method adapts the idea of conceptual metaphors has been proved beneficial for improving learners' awareness of and retention on figurative expressions. However, this method underestimates the importance of metonymy, the other pervasively used figurative language, and the potential difficulties caused by cultural differences among speakers from different language families. Another method which involves the idea of metaphoric mappings, though is believed helpful in providing systematic structures, still begs for empirical evidence of learning effects. The present study aims to investigate the effects of these two cognitive-oriented methods for learning figurative language, including metonymy and metaphor, in an EFL context. Sixty-eight Taiwan's university students participated in the experiment, and were separated into two groups receiving two instructions respectively. The results demonstrate favorable influences on learners' awareness and retention in both groups, but the instruction on metaphoric mappings is especially helpful in facilitating learners' awareness of expressions involving abstract concepts with complicated mapping relationships. The results of the study shed light on the application to EFL teaching and learning of figurative language as well as instruction development.

**Keywords:** Metaphor/metonymy, Learner's awareness, Conceptual metaphor, Metaphoric mappings.

## INTRODUCTION

Researchers in the field of second language acquisition contend that learners' awareness of linguistic motivations is the key to second language acquisition (Ammar, Lightbown, & Spada, 2010; O'Mally & Chamot, 1990; R. Ellis, 2002). L2 learners tend to reflect optimally L1's repeated activation (i.e., entrenchment) and thus suffer from various types of L1 interference (N. Ellis, 2006). To overcome the binding power of L1 and to break cognitive habits, L2 learners first need to notice and realize the existence of new construal systems of the target language. Such cognitive perspectives on second language acquisition further prove the beneficial effects of enhanced awareness in figurative language learning (Boers & Lindstromberg, 2006). Suggestions for doing so include learning the etymology of the metaphorical language (Boers, 2001; Boers, Demecheleer, & Eyckmans, 2004; Boers, Eyckmans, & Stengers, 2007), inferring metaphoric meanings from context (Boers, 2000a; Dong, 2004), guessing the meanings of imageable metaphorical expressions (Boers & Demecheleer, 2001; Boers & Stengers, 2008), and participating in explicit discussions concerning cross-linguistic comparisons (Deignan, Gabry, & Solska, 1997; Low, 1988).

Among those awareness-raising methods, Boers' (2000a, 2000b) cognitive-oriented method has provided a great amount of empirical evidence

on the beneficial effects on L2 learners' learning figurative expressions.

Boers suggests that insightful L2 learning through the process of understanding semantic motivations behind expressions should be implemented often in language classrooms (Boers & Lindstromberg, 2006).

He defines the underlying motivation of figurative expressions as *metaphoric theme*, the structure and organization of the correspondence between the source domain and the target domain (Boers, 2000a). In his study (2000b), L2 learners who were given explanations of figurative expressions in terms of source domains outperformed learners who received explanations of figurative senses of expressions in both an immediate comprehension test and a post-test given three days later. In another study (2000a), Boers found that learners who studied a list of words organized by metaphoric themes were more likely to reproduce the expressions than learners who studied a list organized by traditional functional meanings. The findings support Boers' claim that providing metaphoric themes can enhance learners' awareness of novel expressions and hence facilitate retention of the expressions.

Despite the positive proof of the method, Boers' method of providing conceptual metaphor as a trigger of learners' awareness may be insufficient in some ways. First, the method focuses mainly on *metaphor* but seldom

considers *metonymy*. Considering the intricate interactions between metaphor and metonymy (Barnden, 2010; Goossens, 1990; Radden, 2003), as well as the various influences that metaphor and metonymy may present to L2 learners (Chen & Lai, 2012), the underestimation of the importance of metonymy may lead to overlooking its effects on learning figurative expressions. In addition, the method focuses mainly on raising learners' awareness of semantic motivation but ignores possible gaps between different cultures and languages. Figurative language is rooted not only in languages but also in cultures and conventions (Kövecses, 2000); conflicts between L1 and L2 knowledge may cause great difficulties in learning (Kövecses, 2001). Finally, Boers' studies are conducted primarily in European countries; the participants' native languages, such as French (Boers, 2000a, b) and Dutch (Boers, 2000a), were originated from a language family similar to English, meaning the differences between their cultures and languages were relatively smaller than between other languages. When considering learners of other native tongues, such as Chinese or Japanese learners whose native languages are relatively more different from English in origin and typology, difficulties caused by cultural gaps may be

more serious. The question of whether the method could also be effective for those learners is in need of further investigation.

To bridge the methodological and pedagogical gaps existing in Boers' method, Kövecses (2001) proposed an alternative method, which was to integrate *metaphoric mappings* in L2 learners' learning process. Based on the results of his small-scale study of Hungarian students learning English figurative expressions, Kövecses (2001) speculated that metaphoric mappings not only can improve comprehension but also can facilitate production. If two languages have the same conceptual metaphor but different linguistic instantiations, *ontological mappings* that characterize the correspondences between basic constituent elements in the source domain and in the target domain may help learners to create links between distinct linguistic expressions of the two languages. If two languages have different conceptual metaphors, or if one language has a conceptual metaphor that does not exist in the other language, *epistemic mappings* can provide knowledge about elements in the source domain to the target domain, helping learners to relate their knowledge of the used and abstract to the unused and concrete.

The idea of using metaphoric mappings as explicit instruction not only follows the trend of cognitive linguistics, which values awareness and motivation, but also deals with possible linguistic and cultural gaps by utilizing learners' already-existent world knowledge and universal concepts. The adoption of metaphoric mappings, thus, seems to be promising in helping learners associate conceptual domains and finding the motivations of expressions. However, such idea has not yet been tested empirically. Without empirical evidence, the proposed method has not been able to claim its effects on L2 learning.

The present study, therefore, intends to evaluate the two cognitive-oriented methods in teaching Chinese EFL learners metaphoric and metonymic expressions, determine their effects on L2 figurative language learning, and find a compromising way to teach EFL learners who speak different native languages. The two methods under investigation include the method of conceptual metaphor (CM),<sup>1</sup> which focuses on providing conceptual metaphors so that learners can compare two domains to find associative characteristics, and the method of metaphoric mapping (MM),<sup>2</sup> which emphasizes mapping processes that learners can use to map between domains and between cultures. The present study targets native Chinese

speakers who are learning English as a foreign language to investigate their ability to find figurative expressions and their retention of what they have learned.

## **METHODOLOGY**

### ***Participants***

The participants of the study were 68 first-year university students who were non-English majors with levels of English proficiency ranging from intermediate to high intermediate. They were all native Chinese speakers and had learned English for at least six years during their high school years; none of the participants had lived in foreign countries for over one year. Thus, they had less experience of and exposure to English culture and authentic materials than English majors have. The control of the participants' general English proficiency and experience in English is meant to mitigate the impact of factors identified as complicating in previous studies.

The participants participated in two separate freshman English classes. Each class received one type of method: one class of 32 participants received instruction in conceptual metaphors (the CM group), while the other

class of 36 participants received instruction in metaphoric mappings (the MM group).

### ***Instruments***

To measure the participants' ability to recognize figurative language use, an awareness test was designed. The test consisted of 48 English sentences collected from dictionaries, a corpus (the British National Corpus), and the Internet. The sentences were modified to maintain an average sentence length of 10 to 15 words to ensure that the stimuli were similar and would not influence learners' judgments. The sentences were also reviewed by native English speakers to ensure their grammaticality and authenticity. In addition, the test items were pilot-tested twice for reliability and construct validity, and ambiguous or questionable items were removed.

Among the 48 sentences, 24 sentences contained metaphoric or metonymic expressions and the other 24 sentences were written with chosen keywords or phrases from the sentences with metaphoric/metonymic expressions and contained no figurative intentions in the expressions. Moreover, the sentences that had metaphoric or metonymic expressions were further categorized into four groups based on the metonymy-metaphor



continuum as shown in **Table 1** (Chen & Lai, 2012): metonymy (C1), metaphoric-metonymy (C2), metonymic-metaphor (C3), and metaphor (C4).

Participants were asked to read each sentence first and then determine whether the sentence contained metaphoric/metonymic expressions, or whether it needed to be understood by thinking figuratively. Participants were required to rate the certainty of their judgments on a scale of 1 to 5; to avoid reading problems caused by unknown vocabulary, one extra option (0) was given as well. The average response of the participants would indicate their ability to find metaphors/metonymies.

### ***Procedure***

The experiment required two successive weeks to complete. The pre-test and teaching were conducted the first week, and the post-test was conducted the second week. Both the CM group and the MM group participated in the experiment respectively.

At the beginning of the first week, the participants took the pre-test to determine their default level of awareness. After the test, which took 15 minutes to complete, both the CM group and the MM group received instruction in conceptual metaphors and metaphoric mappings, respectively,

and participated in discussions in Mandarin Chinese about the metaphoric/metonymic expressions used in a given article. The goals of the discussions were to make the participants aware of the pervasiveness of metaphoric and metonymic expressions, to clarify the idea that *pì-yù* ('metaphor') includes not only idioms but also words or phrases, and to draw their attention to the similarities and differences between Chinese and English. The teaching and discussing phase lasted 25 minutes.

During the second week, the participants took the post-test to examine both the effects on retention and whether the two instruction methods caused different learning effects. The post-test contained the same test items as the pre-test but the order of the items was reshuffled. Before taking the test, which also took 15 minutes to finish, the participants were asked whether they had studied relevant subjects during the week to ensure that their performances would result from the effect of learning.

The data were examined by a multiple regression model, which is equivalent to an analysis of variance with covariates. These effects of some external factors, including the participants' scores in English on the Joint College Entrance Exam, their time spent learning English by themselves outside of classes, and their study of relevant subjects during the week, were

calculated during the process of regression testing in order to exclude possible impacts of the participants' individual background differences.

## RESULTS

Table 2 shows the mean performance scores of the participants, which indicate that the participants of both the CM group and the MM group made improvements overall. The improvement of scores also indicates that the participants became more certain about their judgments in recognizing metaphoric/metonymic expressions.

Table 3 reports the differences in the participants' performances between the pre-test and the post-test. Regarding the sentences containing metaphoric/metonymic expressions, the CM group showed no significant progress, whereas the MM group showed significant differences between the two tests ( $\beta=3.04$ ,  $t=2.50$ ,  $p<.01$ ). On the other hand, regarding the sentences containing no metaphoric/metonymic expressions, both groups displayed no significant differences between the two tests.

Table 4 reports the comparison of the progress that the CM group and the MM group made in the post-test. The results show that the CM group made more progress than the MM group did in evaluating both sentences with and without metaphoric/metonymic expressions ( $\beta=-.29$ ,  $t=-1.81$ ,  $p>.05$ ;  $\beta=-.18$ ,

$t=-1.25$ ,  $p>.05$ , respectively); however, the differences between the two groups were not significant.

The specific ways in which the instruction on metaphoric mappings facilitates steady learning required further investigation. Thus, finer-grained analyses based on the metaphor-metonymy continuum were conducted and reported in Table 5. The CM-group participants did not make significant progress on any of the four categories, though they received higher scores on average in the post-test. However, the MM-group participants made significant progress in C3 ( $\beta=2.86$ ,  $t=2.28$ ,  $p<.05$ ), and in C4 ( $\beta= 4.49$ ,  $t= 2.38$ ,  $p<.05$ ).

## DISCUSSIONS

### *Effects on Raising Awareness*

The first focus of the study is EFL learners' awareness of figurative language. The results of the awareness test, as reported in Table 2, show that the participants of both the CM group and the MM group made progress on the test after receiving instruction. The improvement of scores indicates that the participants of both groups became more confident of their judgments in recognizing metaphoric and metonymic expressions after receiving

instruction; the enhanced certainty also indicates the participants' raised awareness of figurative language.

However, the results reported in Table 3 also show that the participants in the MM group performed significantly better in the post-test than in the pre-test while those in the CM group did not. The significance suggests that instruction on metaphoric mappings could be especially beneficial to the learners' awareness in some aspects.

Table 5 reports the analyses on the participants' responses to expressions belonging to different categories on the metaphor-metonymy continuum, and shows that the MM-group participants performed significantly better in evaluating metonymic-metaphoric (C3) and metaphoric expressions (C4), the two categories which were closer to the metaphoric end on the continuum and were considered more abstract in the concepts involved. The findings suggest that instruction on metaphoric mappings can help L2 learners to process abstract concepts and hence can be helpful in noticing and understanding expressions concerning abstract source or target domains.

To sum up, both instruction on conceptual metaphors and instruction on metaphoric mappings proved beneficial in improving EFL learners'

awareness of figurative language use. Moreover, instruction on metaphoric mappings, owing to its structural, systematic, and logical mapping processes, was found to be especially helpful in facilitating learners' awareness of expressions involving more abstract concepts, such as expressions that involved complicated cross-domain mappings and expressions that were not grounded in embodied experiences.

### ***Effects on Retention***

The second focus of the study is EFL learners' retention of figurative language. The general improvements in the post-test demonstrate the effects of receiving instruction during the figurative language learning process. In other words, the improvement of mean scores of the post-test gives positive evidence of beneficial effects on cognitively based instruction, including CM instruction and MM instruction. Furthermore, the MM-group participants gained significantly higher improvements overall on the post-test compared with their performances on the pre-test.

However, when comparing the participants of the two groups' performances, the MM group made less progress than the CM group made, as shown in Table 4. In other words, even though in the post-test the MM-group participants outperformed their previous performances, the degree

of variances regarding individual score changes was not as high as that made by the CM-group participants.

The different levels of progress suggest that the participants of the MM group might have made greater consistent progress in evaluating sentences on the post-test; therefore, the *convergent* variances of the changes resulted in statistical significance, as shown in Table 3. Contrarily, the participants of the CM group might have performed inconsistently on the post-test, meaning the variance of changes was *divergent*. Thus, they did not show significant progress overall. The results of the comparisons, therefore, suggest the answer to the second research question: instruction involving metaphoric mappings can result in longer and steadier effects on retention for learners than instruction involving conceptual metaphors can.

In sum, even though both instruction on conceptual metaphors and instruction on metaphoric mappings produce beneficial effects in raising awareness in EFL learners, instruction on metaphoric mappings can also produce relatively more steady progress. The results are rather consistent with the idea of meaningful learning on second language acquisition (Ausubel, 1963, 1968).

## IMPLICATIONS

The present study provides positive evidence for explicit teaching. The results show that explicit instruction on metaphoric/metonymic expressions, whether focusing on conceptual metaphors or metaphoric mappings, enhanced learners' awareness of figurative language. The present study is constructed based on findings of previous studies (Boers, 2000a, 2000b; Boers & Demecheleer, 2001; Boers, Demecheleer, & Eyckmans, 2004; Boers, Eyckmans, & Stengers, 2007) which have proved that learners perform better when receiving explicit instruction. Therefore, it is reasonable to conclude that explicit teaching is useful in terms of figurative language learning.

Moreover, instruction on metaphoric mappings not only points out ontological mapping links between two source concepts but also demonstrates detailed epistemic mapping processes in an explicit way, resulting in better awareness of expressions that involve more complicated and abstract mapping relationships. In other words, instruction on metaphoric mappings provides not only clear structures of source and target domains but the explicit explanations of the corresponding relationship; thus it helps learners establish construal systems and overcome potential difficulties caused by L1-L2 differences.



In addition, the present study includes metonymy in the experiment. Previous research has suggested that metaphor and metonymy may interact with each other in intricate ways since one motivates the other (Barcelona, 2000; Radden, 2003). However, metonymy has received relatively little treatment in language teaching literature (Littlemore, 2009; Panther & Radden, 1999). The results of the present study show that L2 learners actually reacted differently to metaphor and metonymy. The participants showed apparent improvement in recognizing metaphoric expressions more than in recognizing metonymic expressions after receiving instruction. The different performances on both metaphor and metonymy suggest that the participants sensed the divergence between these two types of figurative expressions and reacted to each type differently. The findings accord with cognitive perspectives of metonymy, which is regarded as equally important to the conceptual system as metaphor (Barnden, 2010; Gibbs, 1999). Thus, the results of the present study suggest that metaphor and metonymy, as well as their intricate interactions, should be paid equal attention in the field of language teaching.

What is worth noticing is that the MM-group participants, after receiving instruction, performed significantly better on evaluating abstract expressions,

including metonymic-metaphoric expressions and metaphoric expressions.

The findings suggest that the MM method can compensate for the conceptual bridges caused by the abstractness of conceptual metaphors or by a lack of clues of embodied descriptions. This finding not only corresponds to Chen and Lai's (2012) study, which contends that learners would react differently to figurative expressions located at different points on the metaphor-metonymy continuum, but also provides further and finer analyses on the learning effects.

## **CONCLUSION**

The present study sheds light on the application of metaphor and metonymy to EFL teaching and learning figurative language in three aspects. First, the hypothesis that explicit instruction in second language acquisition produces beneficial effects is validated. Second, metonymy is suggested to be as equally important as metaphor and should be included in EFL language learning programs. Third, instruction of metaphoric mappings should be incorporated with instruction of conceptual metaphors in order to assist figurative language learning in EFL classrooms.

However, the number of participants sampled in the present study is not large enough to allow for generalization. Due to the limited number of participants, the diversity of the participants' background is minimal. For instance, the proficiency level of the participants of the study was limited to intermediate and high intermediate, meaning they represent only a part of L2 learners in second language or foreign language learning contexts. For future studies, L2 learners with diverse proficiency levels or individual backgrounds should be included to determine the fine-grained effects of the methods. Moreover, since it is believed that understanding figurative expressions requires language users' ability to link disparate perceptual, affective, and conceptual domains, a process that depends highly on creativity (Kogan, 1983; Seitz, 1997) and cognitive style (Johnson & Rosano, 1993), different cognitive styles may result in different learning effects. Though the present study does not integrate this learners' variable into the experiment, further investigation of this issue via future studies is necessary.

#### **ENDNOTES**

<sup>1</sup> The term *conceptual metaphor* here does not refer to Lakoff and Johnson's (1980) definition, as a mapping relationship between the source domain and the target domain. It refers to the mapping processes of figurative language, including both metaphors and metonymies.

<sup>2</sup> Kövecses used the term *metaphoric mappings* in 2001, introducing it as a potential pedagogy for foreign language learners. The present study follows Kövecses' use of the term *metaphoric mappings* and extends it to the mapping processes not only in metaphors but also in metonymies.

## REFERENCES

- Ammar, A., Lightbown, P. M., & Spada, N. (2010). Awareness of L1/L2 differences: does it matter? *Language Awareness*, 19(2), 129-146.
- Ausubel, D. (1963). *The psychology of meaningful verbal learning*. New York: Grune & Stratton.
- Ausubel, D. (1968). *Educational psychology: A cognitive view*. New York: Holt, Rinehart & Winston.
- Barcelona, A. (2001). On the systematic contrastive analysis of conceptual metaphors: Case studies and proposed methodology. In M. Putz, S. Niemeier & R. Dirven (Eds.), *Applied cognitive linguistics II: Language pedagogy* (pp.117-146). Berlin, New York: Mouton de Gruyter.
- Barnden, J. A. (2010). Metaphor and metonymy: Making their connections more slippery. *Cognitive Linguistics*, 21(1), 1-34.
- Boers, F. (2000a). Metaphor awareness and vocabulary retention. *Applied Linguistics*, 21, 553-571.
- Boers, F. (2000b). Enhancing metaphoric awareness in specialised reading. *English for Specific Purposes*, 19, 137-147.
- Boers, F. (2001). Remembering figurative idioms by hypothesising about their origins. *Prospect*, 16, 35-43.

Boers, F., & Demecheleer, M. (2001). Measuring the impact of cross-cultural differences on learners' comprehension of imageable idioms. *ELT Journal*, 55(3), 255-62. Retrieved Oct 26, 2009, from <http://eltj.oxfordjournals.org/cgi/reprint/55/3/>

Boers, F., Demecheleer, M. & Eyckmans J. (2004). Etymological elaboration as a strategy for learning figurative idioms. In P. Bogaards & B. Laufer. (Eds.), *Vocabulary in a Second Language: Selection, Acquisition and Testing* (pp.53-78). Amsterdam/Philadelphia: John Benjamins.

Boers, F., & Lindstromberg, S. (2006) Cognitive linguistic applications in second or foreign language instruction: rationale, proposals, and evaluation. In G. Kristiansen, M. Achard, R. Dirven & F. J. Ruiz de Mendoza Ibáñez (Eds.), *Cognitive linguistics: Current applications and future perspective* (pp.305-355). Berlin: Mouton de Gruyter.

Boers, F., Eyckmans, J., & Stengers, H. (2007). Presenting figurative idioms with a touch of etymology: more than mere mnemonics? *Language Teaching Research*, 11(1), 43-62.

Boers, F. & H. Stengers (2008) Adding sound to the picture: An exercise in motivating the lexical composition of metaphorical idioms in English, Spanish and Dutch. In L. Cameron, M. Zanutto & M. Cavalcanti (Eds.),

*Confronting metaphor in use: An applied linguistic approach*, 63-78.

Amsterdam/Philadelphia: John Benjamins.

Chen, Yi-chen & Lai, Huei-ling (2012). EFL learners' awareness of metonymy–metaphor continuum in figurative expression. *Language Awareness*, 21(3), 235-248.

Deignan, A., Gabrys, D. & Solska, A. (1997). Teaching English metaphors using cross-linguistic awareness-raising activities. *ELT Journal*, 51(4), 352-60.

Dong, Y. (2004). Don't keep them in the dark! Teaching metaphors to English language learners. *English Journal*, 93(4), 29-35.

Ellis, N. (2006). Language acquisition as rational contingency learning. *Applied Linguistics*, 27(1), 1–24.

Ellis, R. (2002). *The study of second language acquisition* (9th ed.). Oxford: Oxford University Press.

Gibbs, R. W. (1999). Speaking and thinking with metonymy. In K. Panther, & G. Radden (Eds.), *Metonymy in language and thought* (pp.61-76).

Amsterdam: John Benjamins.

- Goossens, L. (1990). Metaphonymy: The interaction of metaphor and metonymy in expressions for linguistic action. *Cognitive Linguistics*, 1, 323-340.
- Johnson, J., & Rosano, T. (1993). Relation of cognitive style to metaphor interpretation and second language proficiency. *Applied Psycholinguistics*, 14, 159-175.
- Kogan, N. (1983). Stylistic variation in childhood and adolescence: Creativity, metaphor, and cognitive styles. In J. H. Ravel1 & E. M. Markman (Eds.), *Handbook of child psychology* (Vol.3, 4<sup>th</sup> ed., pp. 695-706). New York: Wiley.
- Kövecses, Z. (2000). The concept of anger: Universal or culture specific? *Psychopathology*, 33(4), 159-170.
- Kövecses, Z. (2001). A cognitive linguistic view of learning idioms in an FLT context. In M. Pütz, S. Niemeier & R. Dirven (Eds.), *Applied cognitive linguistics II: Language pedagogy* (pp. 87-115). Berlin: Mouton de Gruyter.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.



Littlemore, J. (2009). *Applying cognitive linguistics to second language learning and teaching*. UK: Palgrave Macmillan.

Low, G. (1988). On teaching metaphor. *Applied Linguistics*, 9(2), 125-147.

Retrieved February 4, 2009, from

<http://applied.oxfordjournals.org/cgi/reprint/9/2/125>

O'Malley, J. M, & Chamot, A. U. (1990). *Learning strategies in second language acquisition*. Cambridge: Cambridge University Press.

Panther, K., & Radden, G. (Eds.) (1999). *Metonymy in language and thought*.

Amsterdam: John Benjamins.

Radden, G. (2003). How metonymic are metaphors? In R. Dirven & R.

Pörings (Eds.), *Metaphor and metonymy in comparison and contrast*

(pp. 407-434). Berlin, New York: Mouton de Gruyter.

Seitz, J. A. (1997). The development of metaphoric understanding:

Implications for a theory of creativity. *Creativity Research Journal*,

10(4), 347-353. Retrieved April 6, 2011, from

[http://pdfserve.informaworld.com/570249\\_790767489.pdf](http://pdfserve.informaworld.com/570249_790767489.pdf)

## TABLES

**Table 1. Metonymy-metaphor Continuum (Chen & Lai, 2012)**

Metonymy	Metaphoric-metonymy	Metonymic-metaphor	Metaphor
Based on metonymic principle	Based on the combination of metaphor and metonymy		Based on conceptual metaphor

**Table 2. Mean Scores of Participants in the Awareness Test**

Type	CM Group		MM Group	
	Pre-test	Post-test	Pre-test	Post-test
With Figurative Expressions (k=24)	3.50 (.55)	4.17 (.43)	3.52 (.54)	3.97 (.60)
Without Figurative Expressions (k=24)	1.84 (.45)	2.20 (.66)	1.86 (.49)	2.05 (.62)
Sample Size	32		36	

**Note:** k=number of items.

**Note:** Standard deviations are in parentheses.

**Table 3. Differences in Participants' Scores between Pre-test and**

<b>Post-test</b>				
Variables	Sentences with		Sentences without	
	Metaphoric/Metonymic		Metaphoric/Metonymic	
	Expressions		Expressions	
	CM Group	MM Group	CM Group	MM Group
	$\beta$	$\beta$ (t-value)	$\beta$ (t-value)	$\beta$ (t-value)
(Constant)	2.15 (.98)	3.04 (2.50) *	.10 (.05)	1.10 (1.23)
Scores	-.12 (-.75)	-.20 (-2.14) +	.00 (.00)	-.05 (-.72)
Self-learning	-.03 (-.47)	.037 (.64)	.05 (.86)	-.08 (-1.95)
Time				
Review/No	.45 (1.93)	-.11 (-.54)	.28 (1.20)	-.07 (-.47)
Review				
$R^2, F$	$R^2=.13,$	$R^2=.13,$	$R^2=.09, F=.88$	$R^2=.15,$
	$F=1.35$	$F=1.60$		$F=1.90$

**Note:** \*  $p < .05$ , one-tailed, +  $p < .05$ , two-tailed.

**Table 4. Differences in Participants' Scores between the CM and the MM**

<b>Group</b>	Sentences with	Sentences without
	Metaphoric/Metonymic Expressions	Metaphoric/Metonymic Expressions
Variables	$\beta$ (t-value)	$\beta$ (t-value)
(Constant)	2.15 (1.00)	.10 (.06)
Group	-.29 (-1.81)	-.18 (-1.25)
Scores	-.12 (-.76)	.00 (.01)
Self-learning	-.03 (-.48)	.05 (.99)
Time		
Review/No	.45 (1.98)	.28 (1.38)
Review		
GMSC	-.08 (-.44)	-.05 (-.32)
GMSL	.07 (.79)	-.35 (-1.28)
GMR	-.57 (-1.81)	-.13 (-1.86)
$R^2, F$	$R^2=.15, F=1.56$	$R^2=.13, F=1.31$

**Note:** Group: The CM group is coded as 0 and the MM group is coded as 1.

**Note:** GMSC: Means of the scores (MSC) multiplied by Group variable (G).

**Note:** GMSL: Means of the self-learning time (MSL) multiplied by Group variable (G).

**Note:** GMR: Means of answers to the review/no review question (MR) multiplied by Group variable (G).

**Table 5. Differences in Scores on Four Categories between the Pre-test and the Post-test**

		CM Group	MM Group
Variables		$\beta$ (t-value)	$\beta$ (t-value)
C1	(Constant)	-1.85 (-.49)	2.49 (1.67)
	Scores	.17 (.64)	-.14 (-1.26)
	Self-learning Time	.03 (.34)	-.04 (-.50)
	Review/No Review	-.12 (-.31)	-.24 (-.92)
$R^2, F$		$R^2=.02, F=.17$	$R^2=.09, F=1.06$
C2	(Constant)	3.21 (.96)	2.30 (1.35)
	Scores	-.20 (-.84)	-.14 (-1.10)
	Self-learning Time	-.06 (-.70)	-.01 (-.16)
	Review/No Review	.90 (2.53) <sup>+</sup>	-.11 (-.39)
$R^2, F$		$R^2=.19, F=2.25$	$R^2=.05, F=.52$
C3	(Constant)	2.40 (1.26)	2.86 (2.28) <sup>*</sup>
	Scores	-.13 (-.96)	-.19 (-2.01) <sup>+</sup>
	Self-learning Time	-.04 (-.79)	.02 (.40)
	Review/No Review	.01 (.05)	-.01 (-.02)
$R^2, F$		$R^2=.05, F=.46$	$R^2=.11, F=1.43$
C4	(Constant)	4.86 (1.46)	4.49 (2.38) <sup>*</sup>
	Scores	-.32 (-1.32)	-.31 (-2.19) <sup>+</sup>
	Self-learning Time	-.04 (-.48)	.17 (1.92)
	Review/No Review	1.03 (2.90) <sup>+</sup>	-.10 (-.31)
$R^2, F$		$R^2=.25, F=3.18$	$R^2=.18, F=2.31$

**Note:** C1=sentences containing metonymic expressions; C2=sentences containing metaphoric-metonymic expressions; C3=sentences containing metonymic-metaphoric expressions; and C4=sentences containing metaphoric expressions.

**Note:** +  $p < .05$ , one-tailed; \*  $p < .05$ , two-tailed.