

Learning L2 Idioms through Visual Mnemonics*

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Abstract

Due to the importance of idioms, many researchers and teachers have long sought to find ways of making idiom teaching and learning more effective. This study compared three visual mnemonic devices (pictures, mental imagery, and movie clips) in terms of their effect on EFL learners' recognition and recall of English idioms. Ninety intermediate level EFL learners who were preparing themselves for IELTS participated in this study. They were in three groups of thirty members each. Each group was taught idioms using one of the afore-mentioned visual mnemonic devices. Receptive and productive tests of idioms were administered to all groups after the treatment. The one-way ANOVA procedure was used to analyze the collected data. The results revealed statistically significant differences among these devices, with pictures method being the most effective on both recognition and recall of idioms. The findings of the study can have significant theoretical as well as pedagogical implications for language researchers, textbook designers, curriculum developers, teachers, and language learners.

Keywords: idiom, mental imagery, movie clips, pictures, visual mnemonics.

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1. Introduction

According to Wray and Perkins (2000), a working knowledge of a good number of idiomatic expressions is needed to read magazines, stories, and various kinds of books. Idiomatic knowledge is also a requirement for productive skills, including writing and speaking (Andreou & McCarthy, O’Keeffe, & Walsh, 2010). Moreover, idioms and idiomatic expressions play an indisputable role in building fluency (Cain, Towse, & Knight, 2009; Lim, Ang, Lee, & Leong, 2009), and can embellish languages with a natural sense (Hinkel, 2017). Due to their pervasiveness, inherent complexity, and communicative effectiveness, special attention needs to be paid to developing an efficient approach for formal teaching and learning of idioms (Wray, 2000). Despite their essential role in natural discourse (Conklin & Schmitt, 2012; Martinez & Schmitt, 2012; Zarei & Shahidi Pour, 2013), some EFL teachers take a ‘hands-off approach’ (Liontas, 2017, p. 6) and avoid using/teaching them in the classroom (Tran, 2013). Consequently, learners are often exposed to metaphorically-impoverished input (Vasiljevic, 2015a). This implies that teaching and learning of idioms in EFL contexts deserve a reconsideration.

The common belief in structural and generative paradigms is that an idiom is a ‘dead metaphor’ (Caillies & Declercq, 2011; Vasiljevic, 2015a) whose figurative meaning is arbitrary and cannot be predicted based on the meaning of its lexical elements. Accordingly, idioms have been better accounted for via explicit and direct interpretation. Translation and rote-learning have long been considered as the most appropriate methods of learning idiomatic expressions (Chen & Lai, 2013). Contrary to this misconception, more recent studies in cognitive semantics (Croft & Cruse, 2004; Kövecses, 2002) have shown that meaning is by no means arbitrary, but motivated by usage (Boers, Eyckmans, & Stengers, 2007). Szczepaniak and Lew (2011) subscribe to the view that motivation is the cognitive linguistic alternative to the arbitrary-predictable dichotomy. As regards idioms, motivation is the ability of the speaker to comprehend why an idiomatic expression has the figurative meaning it has, by taking into account its systematic

compositional meaning (Zarei & Rahimi, 2012). Despite the unpredictability of the meaning of many idioms based on the surface meanings of their components, some associations can be found between their literal and non-literal meanings (Boers & Webb, 2015). In this regard, mnemonics have been identified as supplementary tools to establish those connections and to bridge the perceived semantic gap.

Several studies have already explored the effectiveness of mnemonic devices on L2 idioms learning (Ghaderi, & Afshinfar, 2014; Vasiljevic, 2015b; Zarei & Salimi, 2012). Nonetheless, there is still a need for empirical research comparing different visual mnemonic devices (pictures, mental imagery, and movie clips) affecting idioms learning. This study was an attempt to partially fill the gap; it addressed these questions:

1. Which visual mnemonic techniques (pictures, mental imagery, and movie clips) are more effective on EFL learners' recognition of English idioms?
2. Which visual mnemonic techniques (pictures, mental imagery, and movie clips) are more effective on EFL learners' recall of English idioms?

2. Literature Review

2.1. Idioms

The term 'idiom' can be described as a form of institutionalized multiword expression the meaning of which cannot necessarily be understood from its constituent parts in such a way that it might be seen as a single word (Brenner, 2011). Non-compositionality, which is closely related to semantic opacity/transparency (Chan, 2014), institutionalization (Grant & Bauer, 2004; Simpson & Mendis, 2003), and syntactic constraints are the prominent characteristics of idioms. Idioms are notoriously challenging for non-native speakers on different grounds. Misalignment between the figurative and literal meaning is the main problem. According to Baker (2011), idioms cannot be understood merely by understanding their constituent words. Language learners need to cope with the lack of correspondence between the

figurative and literal meanings. Even if learners are familiar with the constituent words and are aware of their figurative nature, they may still employ the literal meaning prior to the figurative one, because they often rely on the first language conceptual systems while processing (Carrol & Conklin, 2017; Cieślicka, 2006). They have an inclination to treat idiomatic expressions literally rather than metaphorically (Siyanova-Chanturia, Conklin, & Schmitt, 2011). That is why it is important to enhance language learners' awareness of the significance of idioms and to teach idioms explicitly in language classes.

Effective teaching of idioms was a neglected area in EFL contexts for a long time. Teachers used to teach idiomatic expressions separately, without helping students to deal with figurative language. Therefore, language learners had to rely on rote-learning (Boers, 2001). Then, the role of context became more salient. According to Lontas (2015), context has a facilitative role in understanding, learning and teaching of idioms. Cakir (2011) emphasized pragmatic competence, and stated that teaching idioms alone is not enough; they should be practiced and produced by learners. A number of researchers believe that even context, alone, is insufficient; they hold that learners need further assistance to assign idioms to their memory (Cooper, 1999; Pillai, 2017). A possible way of providing this assistance is using mnemonic devices. There are different mnemonic devices including visual, verbal, linguistic, etc. For the sake of manageability, this study focuses on visual mnemonics.

2.2. Visual Mnemonics

The term 'mnemonic' is related to memory. According to Schmitt (2008), memory strategies are conventionally known as mnemonics. Mnemonic tools incorporate new pieces of information into or merge them with prior knowledge by using acoustic or visual cues (Kuder, 2017). Congos (2011) asserts that mnemonics help students to remember large amounts of information. Mnemonic techniques have already been used to boost learning vocabulary (Dresler et al., 2017; Hunt & Worthen, 2011). Mnemonic devices are broadly classified into five major categories (Thompson, 1987); namely: linguistic

mnemonics, verbal mnemonics, spatial mnemonics, visual mnemonic, and physical responses methods. Each category of mnemonics is further divided into subcategories. This study focused on pictures, movie clips and mental imagery from the wide range of visual mnemonics.

Pictures are one of the subcategories of visual mnemonic devices. Pictures are said to be worth a thousand words (Farley, Pahom, & Ramonda, 2014). They serve as useful cognitive devices in language learning provided that they are selected carefully and that they are able to clarify the target elements. Pictorial enrichment leads to deeper learning and understanding of texts (Schnotz, 2002; Schnotz & Bannert, 2003). They even facilitate creating mental representations (Eitel & Scheiter, 2015). From a broader perspective, the cognitive theory of multimedia learning is rooted in three underlying factors: i) the dual coding assumption, ii) the limited capacity assumption, and iii) the active processing assumption. The dual coding theory will be discussed later. According to Sweller (1999), the concept behind the limited capacity assumption is the fact that learners are merely able to acquire a small amount of information at any given time in a particular channel. Finally, the active processing assumption has to do with meaningful learning. Using images and pictures can foster 'meaningful learning' in the sense that students' attention is drawn to salient aspects of the learning material (Mayer & Moreno, 2003). The key point behind meaningful learning is that learners can actively anchor new concepts and ideas with existing ones. Therefore, pictures play an undeniable role in this cognitive process. To sum up, the use of relevant pictures that show relevant scenes can add to the appeal of the materials (Carney & Levin, 2002) and facilitate the comprehension and recall of L2 idioms. Several studies have already explored the impact of pictures on learning vocabulary and idioms (Barcroft & Sunderman 2008; Boers, Piquer-Piriz, Stengers & Eyckmans, 2009; Farley, Ramonda, & Liu, 2014; Hagiwara, 2015). Paivio (2006) gives equal prominence to nonverbal and verbal processing by differentiating between two independent subsystems in Dual Coding Theory (henceforth, DCT): a verbal subsystem (language) and a nonverbal subsystem (imagery).

DCT explores how people use these two subsystems concurrently to process information (Shen, 2010). The promising effects of using pictures can also be associated with Embodied Cognition (Foglia & Wilson, 2013), according to which cognitive processes are closely interwoven with different types of sensory input. Accordingly, embodied, tangible pictures of linguistic elements can facilitate meaningful learning.

According to Sadoski (2005), the association between verbal information and the mental image is beneficial in the sense that it offers another way of recollecting verbal information. According to DCT, associations between verbal input and an image (nonverbal information) can facilitate recall (Sadoski & Paivio, 2013).

To test this assumption, Boers et al. (2008) studied the effectiveness of pictures using three case studies. They examined variables like the timing of visual support, and the potential effect of cognitive styles. Illustrations depicting the literal meaning of idioms were presented during the feedback for the first exercise after providing the participants with cultural, historical, and etymological information about idioms. The results suggested a positive effect of visual input. Furthermore, Szczepaniak and Lew (2011) studied the effectiveness of using images in idiom dictionaries. The results revealed that imagery positively affected the learning of both idiom form and meaning (specially, the acquisition of their linguistic forms). In another study, Vasiljevic (2013) studied the acquisition of L2 idioms under two different conditions: i) When instruction focused only on verbal definitions, and ii) when these definitions were followed by images generated by learners for the literal meaning of the target idioms. Their results suggested the facilitative role of pictorial support in the retention of the idiom forms, but not the figurative meaning. The results further indicated that pictorial representation of the literal meanings of L2 transparent idioms had a positive effect on learning in EFL contexts. Baker (2011) explored the effect of images on short and long-term recall of idioms. Based on the results, using illustrations and explaining the etymology could both improve the recall of idioms.

Vasiljevic (2015b) explains that associations between verbal information and images can be triggered in two different ways: directly (conceptually) and indirectly (using mental images). On the one hand, based on the tenets of ‘level of processing’ framework, verbal information (words) entails both sensory and semantic features, and both types of information can be processed and represented in human memory (Schüler, Arndt, & Scheiter, 2015). Therefore, providing visual support can facilitate the retention and recall of target items by prompting activation of their sensory attributes.

In the same vein, Zarei and Salimi (2012) studied the effects of three ways of vocabulary teaching through the keyword method, songs, and pictures on L2 vocabulary recognition and production. They observed that picture was most effective technique. In another study, Saffarian, Gorjian, and Bavizadeh (2013) explored the role of visual images in the retention of idioms. The experimental groups were presented with body idioms through visualization, but the control group received the definition of each idiom. The results suggested that visual images significantly and positively influenced learners’ retention of idioms. Likewise, Pillai (2017) reported that visual mnemonics were influential in boosting students’ self-esteem, autonomy and learning. In another study, Abbasi, Rohani and Zeidabadi-Nejad (2015) compared the effect of pictures, first language translation, and second language definition on idioms learning. They reported that the group taught through pictures outperformed the other ones in both idioms recognition and idioms production.

Mental imagery is the second visual technique used in this study. Rather than using real pictures, mental imagery allows the visualization of a concept or a word. In this technique, the learner is helped to develop a mental representation of a concept; s/he imagines a scene or a picture that is somehow connected with the intended concept/word. The imagery process has to do with recalling representations from alternative stimuli to re-create the first representation (Pearson, Naselaris, Holmes, & Kosslyn, 2015). Relating a word to a visual picture may be especially useful for learning abstract words (Holden,

1999). Nippold and Duthie (2003) explored the effect of mental imagery on the acquisition of transparent versus opaque idioms. They reported that both children and adults could create mental images for both opaque and semantically transparent idioms. However, both groups created more mental images for transparent idioms. Using this mental image and contextual clues, the learner can grasp the meaning of this idiom. The case is totally different for opaque idioms such as '*paint the town red*' where the mental image might mislead the learners if they have not encountered them before.

Boers et al. (2009) studied the effect of pictorial elucidation on idioms learning and concluded that this technique facilitates comprehension and remembrance of their meaning. However, the results also suggested that adding pictures to verbal explanation had a negligible effect on the recall of the form of idioms.

Another visual mnemonic device is the use of films and movie clips. Films can offer a plethora of benefits, especially in EFL contexts. They increase students' motivation and develop intercultural communication (King, 2002; Pegrum, 2008; Pegrum, Hartley & Wechtler, 2005). Movie clips and animations might simplify learners' understanding of complex ideas. Animations can also increase motivation and reduce cognitive (Ainsworth, 2008). Moreover, movies display the use of colloquial language in authentic, real life settings. Consequently, they can provide language learners with a golden opportunity to get exposed to various slangs, reduced speech, stress patterns, native speaker voices and accents (Stempleski, 2000).

In one of the studies in this area, Chan (2014) created a corpus of idioms collected from various contemporary ESL sources that included movies, T.V., and other forms of media. The researcher collected data from both native as well as non-native speakers on their use as well as comprehension of the identified idioms. He compared his corpus of idioms to three idiom textbooks to analyze for frequency of occurrence. Chan found a definite disconnect between idioms that occur in real life and those which are taught to language learners. He discovered that only a very small fraction of those that occurred most frequently in

authentic language were in idiom textbooks. He concluded that curricular changes which include more instruction on informal language in the classroom should be implemented. Similarly, Quiang, Hai, and Wolff (2007) managed to show that exposure to language in films can be more favorable for learners' communicative skills than grammar. In another study, Silvia (2008) highlighted the entertainment value of movies. This particular feature intensifies interest in the subject, which, in turn, can enhance learners' motivation to learn. Tabatabaei and Gahroei (2011) confirmed the facilitative role of movie clips in the teaching and learning of idiom. They concluded that films can be a rich resource for idioms learning. In a similar study, Ghaderi and Afshinfar (2014) compared the effects of animated and static pictures on L2 idioms learning. The results suggested that using animated pictures was more effective on the intake and retention of idioms.

As is evident from the above review, previous research is largely indicative of the positive effect of visual mnemonics on L2 idioms learning. Nevertheless, few studies, if any, have compared the effect of the three visual mnemonic devices (pictures, movie clips, and mental imagery) on the recognition and recall of English idioms. The present study is meant to bridge this gap in the literature.

3. Method

3.1. Participants

A sample of 90 Iranian female and male language learners studying at Afarinesh IELTS House in Tehran took part in this study. They were in three groups of thirty members each. Their level of proficiency was intermediate (based on their educational profiles at the institute). To homogenize the participants, an Oxford Placement Test (OPT) was given before the study.

3.2. Instruments

The researchers used the following data collection instruments and teaching materials. The OPT was administered to homogenize the participants. This pretest included 50 multiple choice items which gauged the participants' vocabulary and grammar. It also had a reading

passage followed by ten comprehension items, as well as a writing task. The learners had 75 minutes to answer the questions. The reliability index of the test was .81, based on KR-21 formula.

To reduce the potential effect of the learners' prior knowledge of idioms, the second pretest (the idioms test) was administered. The idioms test included 140 items. Each idiom was included in a sentence and bold-faced. The learners were expected to write the Persian definitions of the idioms. Idioms that were familiar to more than 10 percent of the participants were excluded from subsequent post-tests. 85 minutes were allocated for this test. The reliability of this pre-test was estimated using the KR-21 formula, and the result was .79.

The teaching materials included 140 idiomatic expressions selected from a variety of sources including: The American Heritage Dictionary of Idioms (Ammer, 1997), Oxford Dictionary of Idioms (Siefring, 2005), Dictionary of Idioms and Their Origin (Flavell, 1992), Idioms and Phrasal Verbs: Intermediate (Gairns & Redman, 2011), Idioms in Use (O'Dell & McCarthy, 2010).

To collect data, two post-tests were also utilized. A test of idioms in multiple-choice form that consisted of 30 items was used to check the participants' recognition of idioms. The participants were expected to select the alternative best describing the meaning of the bolded idioms or to choose the correct alternative to fill the blank in each of the statements. The reliability index of this test, estimated through the KR-21 formula, was 0.80. Since the items in this test were chosen from the instructed idioms, the content validity of the test could be taken for granted. Nonetheless, a panel of experts confirmed the validity of the test.

A 30-item test in fill-in-the-blanks format was used to check the effects of visual mnemonics on the recall of idioms. In each item, there was a sentence that included a blank to be filled with one of the target items. Similar to the recognition test, a panel of experts confirmed the content validity of this test prior to its administration, and its reliability was estimated to be 0.78.

3.3. Procedure

To address the research questions of the study, the following steps were taken:

A sample population of 120 Iranian students, preparing for IELTS at Afarinesh IELTS House in Tehran participated in this study. The sampling technique applied was convenience sampling, based on availability. The students were at intermediate level of language proficiency. To begin with, participants were homogenized using Oxford Placement Test. The scores that were more than one standard deviation above or below the mean score were eliminated from statistical analysis. After homogenization and participant attrition, there were 90 students left, 30 for each treatment condition.

After using the idioms pre-test to ensure that the participants had no previous knowledge of the selected idioms, the treatments were given. The experimental intervention consisted of eight sessions, during which each group of participants was instructed the pre-determined idioms using the mnemonic devices described below. Each session lasted between 50 to 60 minutes during which 15 to 18 idioms were presented.

Group 1 received instruction through pictures. In this group, the instructor showed the students the target idioms and asked them to guess their meanings, one by one. Then, she presented some pictures related to each idiom and elicited students' responses about the possible meanings of idioms. Finally, the instructor gave the meaning of the idioms in the target language. Then, the instructor used examples to make the meaning of the target idioms clear. Students were then asked to use the idioms in examples/sentences to ensure that they had understood their meanings. Their sentences were corrected by their peers, and the instructor provided the students with the final feedback and put the best sentences on the board.



Bury the hatchet

Group 2 received instruction through mental imagery. For this group, the instructor wrote the pre-selected target idioms for a particular session on the board; the students had to imagine the situation she was about to describe. The target idioms were used in pre-selected situations described by the instructor, and the students were encouraged to have a mental representation of them. The participants were asked to guess which idioms were required in that specific context as the instructor/researcher unfolded the setting. Then, the students were encouraged to make sentences using the instructed idioms. They read their sentences aloud, and their peers as well as the instructor corrected them if necessary.

Group 3 received instruction through animations and movie clips. The students watched animations and short video clips containing the pre-selected target idioms. Each video clip was played two or three times. The instructor asked questions about the conversations in the clips. Finally, she asked students to explain the meaning of the idiom(s) used in the clip in Persian and elaborate on their meanings afterwards. The students were encouraged to use the instructed idioms in sentences immediately after the instruction. They were also required to read their sentences aloud to receive feedback from their peers and/or the instructor.

At the end of the experiment, the two posttests were administered to all the three groups. The collected data were summarized and prepared statistical analysis.

3.4. Data Analysis

After the post-tests, the scores of the students were compared using the One-way ANOVA procedure. Assumptions of ANOVA were checked prior to using it.

4. Results and Discussion

4.1. Result

4.1.1. Research Question One

The first research question investigated the effects of visual mnemonic techniques on idioms recognition. To address this question, a one-way analysis of variance was used. Descriptive statistics are shown in the following table.

Table 1.
Descriptive statistics for the ANOVA on idiom recognition

	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
1 picture	30	23.03	2.371	22.15	23.92
2 movie clips	30	21.90	2.023	21.14	22.66
3 mental imagery	30	21.17	2.102	20.38	21.95
Total	90	22.03	2.281	21.56	22.51

According to Table 1, the picture group got the highest mean on the English idiom recognition test, followed by the movie clips group and the mental imagery group. To determine whether or not these differences among the groups are statistically significant, the students' posttest scores were compared using ANOVA. Before running ANOVA, its assumptions were checked. The result of Levene's test of homogeneity of variances showed that this assumption was not violated

(Levene Statistic= .782, Sig. = .461 > .05). There was no violation of the other assumptions (interval data, normal distribution, independence of observations, etc.) either. The result of the ANOVA is given in Table 2.

Table 2.

The result of ANOVA on idiom recognition

	Sum Squares	ofdf	Mean Square	F	Sig.
Between Groups	53.067	2	26.533	5.633	.005
Within Groups	409.833	87	4.711		
Total	462.900	89		$\omega^2= 0.114$	

As Table 2 suggests, the differences among the different mnemonic groups are statistically significant ($F_{(2, 87)} = 5.633, p < .005$). Thus, pictures, movie clips, and mental imagery have differential effects on idioms recognition. The effect size ($\omega^2= .114$) shows that the visual mnemonics can explain over 11 percent of the variability among the groups. Given Cohen's (1988) guidelines, this effect size is moderate. Table 3 shows the result of the Post Hoc Tukey HSD Test that was used to pinpoint the significant differences.

Table 3.

Post hoc results for idiom recognition

(I) group	(J) group	Mean Differen ce (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
1 picture	2 movie clips	1.133	.113	-.20	2.47
	3 mental imagery	1.867*	.004	.53	3.20

2 movie clips	3	mental.733	.394	-.60	2.07
		imagery			

Table 3 indicates that ‘pictures’ are significantly more effective than mental imagery on idiom recognition. However, other mean differences are not statistically significant.

4.1.2. Research Question Two

The second question addressed the effects of pictures, movie clips and mental imagery on idioms recall. A one-way ANOVA was used to answer this question. Table 4 summarizes descriptive statistics. As shown in Table 4, the picture group and the imagery group have the highest and the lowest mean scores, respectively.

Table 4.

Descriptive statistics for the ANOVA on idiom recall

	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
1 picture	30	22.13	2.097	21.35	22.92
2 movie clips	30	19.57	1.977	18.83	20.30
3 mental imagery	30	17.93	2.449	17.02	18.85
Total	90	19.88	2.772	19.30	20.46

To learn if the differences are significant, learners’ scores on the posttest were compared using the ANOVA after checking the assumptions (Levene Statistic= .820, Sig. = .444 > .05). The result is included in Table 5.

Table 5.

Results of ANOVA on idiom recall

	Sum of Squares	df	Mean Square	F	Sig.
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Between Groups	268.956	2	134.478	28.212	.000
Within Groups	414.700	87	4.767		
Total	683.656	89		$\omega^2 = .393$	

Table 5 is indicative of significant group differences ($F_{(2, 87)} = 28.212, p < .0005$). Besides, given the Omega squared ($\omega^2 = .393$), different visual mnemonics can account for about 39 percent of the variability among the groups. To find out where the differences lie, we used the Post Hoc Tukey HSD Test. The result of the test is in Table 6, shows that the picture is more effective than the movie clips and mental imagery techniques. In addition, movie clips technique is more effective than mental imagery.

Table 6.

Post hoc results for idiom recall

(I) group	(J) group	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
	2 movie clips	2.567*	.000	1.22	3.91
1 picture	3mental imagery	2.200*	.000	2.86	5.54
2 movie clips	3mental imagery	1.633*	.013	.29	2.98

4.2. Discussion

The findings of this study revealed the significantly differential effects of pictures, mental imagery, and movie clips on both recognition and recall of English idioms. As to idiom recognition, using pictures was more beneficial than mental imagery, whereas pictures and movie clips as well as mental imagery and movie clips had no significant differences. Regarding idioms recall, picture was more effective than both mental imagery and movie clips. The better performance of

pictures group can be explained from different perspectives. On the theoretical ground, the better performance of the pictures group is compatible with Paivio's Dual Coding Theory. According to this theory, both verbal and non-verbal (i.e. visual) aspects of input promote cognitive processing (Shen, 2010; Welcome, Paivio, McRae & Joanisse, 2011). Moreover, according to the cognitive linguistic paradigm (Croft & Cruse, 2004; Kövecses, 2002), the figurative meaning of an idiom is not totally arbitrary, but is motivated by its literal usage (Boers et al., 2007). As a result, pictures can be used as perceptible links between the linguistic forms and figurative meanings of idioms (Boers & Webb, 2015). Illustrative pictures, as cognitive tools and one mode of multimedia instruction/learning, can evoke metalinguistic awareness, and reduce cognitive load on working memory, thus facilitating the cognitive processing of idioms. This finding is compatible with the observation that pictures facilitate language learning if chosen carefully to clarify target items vividly (Boers et al., 2009). Besides, pictures are also able to contribute to the active processing assumption and meaningful learning since the central idea behind meaningful learning is for learners to actively engage in cognitive processing, considering integral visual and verbal material, and integrating the incoming material with existing knowledge (Mayer & Moreno, 2003). Thus, pictures facilitate the cognitive processes involved in the recognition and recall of L2 idioms. Dobrovol'skij and Piirainen (2005) identify 'additional naming' and 'image component' as two substantial criteria for figurativity. Additional naming is associated with the fact that idioms serve as an alternative way of denoting a given concept. Using pictures, however, is related to the image component, which, according to Dobrovol'skij and Piirainen (2005), refers to the cognitive 'bridge' emerging between the literal and figurative aspects of an idiom. Furthermore, the image component criterion is capable of tapping into the holistic nature of idiom meaning (Timofeeva-Timofeev & Vargas-Sierra, 2015)

From the empirical perspective, the findings of this study are in accordance with similar studies that have confirmed the effectiveness

of enrichment by means of pictorial devices. The findings are particularly consistent with Vasiljevic's (2015b) observation that verbal and pictorial clues facilitate idioms learning since such information can be visually and verbally encoded, thereby helping learners to stick idioms to their memory. According to Vasiljevic (2015b), visual support has a positive role in the recall of idioms. However, whether and how much visualization can enhance remembering the form and meaning of idioms is still unknown. The findings are also compatible with those of Zarei and Salimi (2012). The only difference is that they focused on L2 vocabulary learning. They also reported that the group which was instructed using pictures had the best performance. The present findings are also consistent with that of Abbasi, Rohani and Zeidabadi-Nejad (2015). They reported the effectiveness of pictorial support in the recognition and production of idioms.

As to idioms recall, the positive effect of enrichment of idiomatic input with pictures can be attributed to the 'level of processing framework' (Craik & Lockhart, 1972). According to this model, pictorial enrichment can result in better memory performance. The 'level of processing framework' anticipates that memory performance relies, to a large extent, on the depth of information encoding. In our case, enriching an idiom with a picture allows for much deeper encoding than simply encountering the idiom. Pictorial enrichment can also enhance semantic processing of idioms and consolidate their retrieval and recall.

The findings of this study also indicated that pictures are more effective than movie clips on L2 idioms recall. This finding is, somehow, in contrast with that of Ghaderi and Afshinfar (2014), who concluded that animated pictures were more effective than static ones on learning English idioms. One Potential reason to explain our finding may be cognitive overload. Considering the limited capacity assumption, this observation can be associated with the possible cognitive overload while watching movie clips.

In case of mental imagery, Boers et al. (2008) reported results different from ours. They found that learners who could think in

pictures learnt idioms much more effectively than others. Notwithstanding the beneficial role of this technique, in the present study, mental imagery turned out to be the least effective way of teaching idioms. This finding may be accounted for by the tenets of Embodied Cognition (Foglia & Wilson, 2013), based on which concrete and tangible sights and sounds enhance cognitive processes including information processing and learning. In case of mental imagery, as the name suggests, images exist only in language learners' imagination. To add to the problem, some individuals may not possess a strong sense of imagination and creativity to envisage vivid items. The possibility of having erroneous interpretations while using mental imagery cannot be excluded in this regard.

5. Conclusion and Implications

The findings of this study indicate the effectiveness of pictorial enrichment on L2 idioms learning. Pictures are motivating and interesting. They can reduce the cognitive overload on working memory and facilitate cognitive processing. In addition, pictures are able to promote developing positive attitudes towards the learning process, in general, and idioms learning, in particular. Consequently, it can be concluded that, rather than using the obsolete practice of providing learners with a list of idioms and their L1 equivalents and forcing them to memorize them without any association, it is of significance to equip learners with meaningful pictures and images of idioms. The finding that both pictures and movie clips were more effective than mental imagery on both idioms recognition and recall indicates that students can benefit more from concrete and tangible experiences rather than abstract intangible mental images. From these findings, it can also be concluded that the principles of the dual coding theory, active processing assumption, and level of processing framework hold true in idioms learning. Pictures and movie clips engage learners in the learning process verbally and non-verbally (visually). They enable students to fathom the non-literal meaning (beyond the surface meaning) which is carried by the literal form of an idiom and facilitate inferential processes.

Given the difficulties involved in taking movie clips into language classrooms including the problems of availability of suitable movie clips, lack of expertise on the side of the teacher to edit/modify movie clips to make them suitable for learners, lack of recording and playback equipment, cost, etc., it may be concluded that teachers need to pay more serious attention to pictures as a valuable, easily available, low cost, and versatile tool to improve L2 idioms learning. Syllabus designers and materials developers also need to give more space in their materials to visual/pictorial information. By so doing, they can make their materials not only more effective but also more appealing and attractive, helping learners to engage with the materials both cognitively and emotionally.

Of course, considering individual differences and the diversity of learning styles, it might be concluded that different learners may benefit from various mnemonics with varying degrees depending on their learning styles and preferences. Pictures, movie clips, and mental imagery are subcategories of visual mnemonics; therefore, visual learners may benefit from them most. For manageability reasons, this study merely focused on visual mnemonics. Future studies can investigate the role of leaning styles of learners as one of the factors in idioms learning.

In short, care must be taken in interpreting the findings of this study as it involved a number of limitations. The study was limited to an EFL context, the treatment duration was limited, and only intermediate-level students participated in the study. Considering these caveats, care should be taken not to overgeneralize the findings of the study.

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