

Emotioncy-Based Language Instruction: A Key to Enhancing EFL Learners' Vocabulary Retention

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Abstract: Given the vital role that vocabulary plays in learning a language along with the fact that sense-induced emotions are noteworthy due to their influence on cognition, this study examined the impact of emotioncy-based language instruction on the long-term memory (LTM) vocabulary retention of Iranian EFL learners. To this end, 32 participants were selected based on their level of trait/state anxiety, working memory span, language proficiency, neophobia, and emotioncy towards the selected words to be instructed. Two weeks after the instruction session, the participants were given a retention test. To compare the mean scores of each participant exposed to the three emotioncy-based language instruction conditions (i.e., avolvement, exvolvement, and involvement), a one-way repeated measures ANOVA was employed. The results showed that the participants outperformed in recalling the words that were taught through the involvement level of the hierarchy of the emotioncy model in comparison to those taught through the exvolvement level as what is currently practiced in language classrooms. Finally, drawing on the concepts of emotioncy, emo-sensory quotient, embodied cognition, and multisensory learning, the study elaborates on the value of senses in evoking emotions conducive to cognition and memory enhancement. After all, the study suggests that senses act as the main gears that stimulate the evocation of certain emotions, and the resultant emotions shape cognition, resulting in better LTM retention of vocabulary items.

Keywords: Vocabulary, Retention, Emotioncy, Emo-sensory Quotient, Embodied Cognition, Multisensory Learning.

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Introduction

One of the most notable tasks in the process of foreign language (FL) learning is to master a reasonably sizable vocabulary quickly to improve the ability to express yourself and communicate with others effectively. Many Scholars (e.g., Folse, 2004; Gu, 2003; Lewis, 1993; Nation, 1994; Schmitt, 2000) have underscored the centrality of vocabulary in language teaching and learning and believe that a limited vocabulary hinders successful communication since without a considerable knowledge of vocabulary we will not be able to use the functions or structures we have learned. On the other hand, it is widely acknowledged that vocabulary learning and subsequently the retention of the previously acquired vocabulary is perhaps the greatest source of problem for FL learners (Nation, 1994).

There have been myriad ways of teaching words during the history of FL or second language (L2) teaching attempting to provide learners with an effective practice to increase retention. Some cases in point are contextualized vocabulary teaching (e.g., Baleghizadeh & Shahry, 2011; Kuhn & Stahl, 1998), retrieval practice of new words (e.g., Folse, 2006; Karpicke & Roediger, 2008), strategy-based vocabulary instruction (e.g., Eslami Rasekh & Ranjbar, 2003; Trujillo, Álvarez, Zamudio, & Morales, 2015), and use of multimedia technology (e.g., Shi, 2017).

Further, considering the importance of emotions in the process of learning (Schutz & Pekrun, 2007), Pishghadam, Tabatabaeyan, and Navari (2013) suggested that learners' lexical emotions are led to profound knowledge of vocabulary. They coined the term emotioncy and highlighted the role of the sensory experiences that bring about specific emotions in individual learners as they engage in the process of language learning. Consequently, to substantiate this claim any further, Pishghadam, Jajarmi, and Shayesteh (2016) offered clear evidence for the value of the senses through which individuals receive inputs and proposed the concept of sensory relativism contending that senses intertwined by emotions can relativize cognition.

As opposed to the conventional concept of development that isolates senses and emotions from cognition, Greenspan (1992) suggested that feelings and emotions assume a basic part in enhancing the cognitive abilities. Since emotion modulates every facet of cognition, emotional experiences are critical in educational settings (Tyng, Amin, Saad, & Malik, 2017) and should be taken into account in designing lesson plans to enhance LTM retention as well as learning (Shen, Wang, & Shen, 2009). In the same vein, the emotioncy-based language instruction (Pishghadam et al., 2013) attempts to highlight the paramount role

of language learners' sense-induced emotions in boosting their cognitive and intellectual abilities, which in turn leads them to achieve academic success.

An area of concern to teachers instructing English as a foreign language (EFL) is how to manage the heavy load of new words to improve the learners' long-term memory (LTM) retention of the new vocabulary. Emotioncy-based language instruction tries to bridge the gap between a new word and its associated unknown world; thus, it is assumed that teachers can facilitate vocabulary learning by helping learners reach higher levels of emotioncy towards the instructed vocabulary items in EFL classrooms and enhance their LTM retention. Bearing this in mind, this study attempts to examine the impact of emotioncy-based language instruction on the Iranian EFL learners' vocabulary retention.

Theoretical Background

Sense, Emotion, and Cognition

Senses and emotions are entwined closely, having a mutual influence on each other (Pishghadam & Shayesteh, 2017). Basically, sensory experiences evoke emotions and are conjoined into a single concept. Therefore, individual experiences become meaningful to a great extent based upon the resultant emotions induced by senses (Thomson, Crocker, & Marketo, 2010). Moreover, research in diverse fields including cognitive psychology (e.g., Storbeck & Clore, 2007) and neuroscience (e.g., Crocker et al, 2013) reveal the inherent relationship of sense-induced emotions and cognition suggesting that emotionality has the ability to consolidate cognitive processing of concepts and strategies of teaching (Demetriou, Wilson, & Winterbottom, 2009; Hargreaves, 1998). As Arnheim (1997) remarked, human thinking occurs in the domain of the senses and cannot surpass the patterns supplied by the human senses.

Based on the interactive nature of emotions and senses and their influence on cognition and learning, Pishghadam (2018) introduced the concept of emo-sensory quotient (ESQ), as an individual's ability to identify sense-induced emotions and to manage them in order to guide his behavior, and contended that ESQ can inform L2/FL education to a great extent. Underscoring the significance of the evoked emotions by senses as a result of the interactions of the learners with their environment, ESQ veers beyond the mere combination of emotional intelligence and sensory intelligence and highlights the inseparability of senses and emotions (Pishghadam & Shayesteh, 2017) and the impact of sense-induced emotions on learning (Pishghadam, 2018).

Embodied cognition, as a research program applicable to the field of language teaching, is another prominent example that emphasizes the direct relationship between body (senses) and mind (cognition). The central assumption of embodied cognition is that “the body functions as a *constituent* of the mind rather than a passive perceiver and actor *servicing* the mind” (Leitan & Chaffey, 2014, p.3). Essentially, Shapiro (2011) identified three conceptions for embodied cognition: 1) conceptualization (the concepts that individual organisms can obtain are determined and restricted by the features of the organisms’ body); 2) replacement (the organisms’ bodily interactions with the environment replaces the requirement for the representation of a processing, hence, cognition can be set out without appealing to representational states or computational processes); and 3) constitution (cognitive processing is not restricted to the brain and comprises the body and world as well). More explicitly, according to the tenets of embodied cognition, the body is productive of and directly involved in cognition (Shapiro, 2007).

Another concept that accentuates the prominence of senses in language learning (Baltova, 1999; Massaro, 2004) is the multisensory learning approach. According to Baines (2008), an overwhelming attribute of multisensory learning is that the techniques of instruction can attract the learners’ attention and arouse their interest in getting involved in the process of learning. He introduces the roots of multisensory learning in the theory of multiple intelligences put forward by Gardner (1999) holding the idea that learners are talented in different ways; and the movement of learning styles (Dunn, 1984) classifying learners based on their preferred modality of acquiring new information, that is, auditory, visual, tactile, and kinesthetic. Accordingly, the expectation that teachers should match their teaching styles to the learners’ preferred style of learning does not seem to be a realistic one (Baines, 2008). At its core, the use of multisensory techniques evokes the preferred learning styles by activating different parts of the learners’ brains and thus their full faculties, such as hearing, seeing, smelling, touching, tasting, and thinking in various situations resulting in better learning than when materials are acquired via the current practice of teaching to the test (Baines, 2008).

In a similar manner, we believe that by using the emotioncy-based language instruction, we can highlight the significance of the utilization of senses for language learners. In other words, drawing on their sense-induced emotions, we can assist learners in improving their learning and consequently the retention of the learned materials, that is, vocabulary items in this study.

Emotioncy

Inspired by Greenspan's Developmental, Individual difference, Relationship-based (DIR) model of first language (L1) acquisition, Pishghadam, Adamson, and Shayesteh (2013) highlighted learners' emotional abilities, particularly those associated with their experiences in L1 and maintained the idea that emotional involvement is conducive to meaningfulness, which in turn, facilitates language learning. They asserted that, individuals, generally, hold varying levels of emotions which are primarily induced by senses, technically called as emotioncy (emotion + frequency), towards various items of a language depending on whether they have heard, seen, smelled, touched, experienced, or done research on that item. Indeed, emotioncy claims that "individuals can construct their idiosyncratic understanding of the world through their senses" (Pishghadam et al., 2016, p. 14).

Pishghadam (2015) further developed the concept by devising a six-level emotioncy model (Figure 1), labeled with different kinds and varying measures of emotioncy: Null emotioncy (0) (i.e., Avolvement); Auditory (1), Visual (2), and Kinesthetic emotioncy (3) (i.e., Exvolvement); and Inner (4) and Arch emotioncy (5) (i.e., Involvement). To explicate, avolvement refers to possessing null emotioncy towards a word or a concept, that is, when an individual has neither word nor world knowledge about that word or concept, s/he holds null emotioncy towards it. Exvolvement refers to the emotioncy an individual possesses as a result of hearing about, seeing, or touching the real object referring to that item. Finally, involvement happens when an individual has experienced directly that item or concept (inner emotioncy); for example, s/he has tasted a specific kind of food or has done a phlebotomy her/himself. Additionally, when an individual studies or conducts research on an item or concept to get extra information, it is said to have arch emotioncy towards that item or concept (see Table 1).

Table 1. *Emotioncy Types and Kinds*

Type	Kind	Experience
Avolvement	Null emotioncy	When an individual has not heard about, seen, or experienced an object or a concept.
	Auditory emotioncy	When an individual has merely heard about a word/concept.
Exvolvement	Visual emotioncy	When an individual has both heard about and seen the item.
	Kinesthetic emotioncy	When an individual has touched, worked, or played with the real object.
Involvement	Inner emotioncy	When an individual has directly experienced the word/concept.
	Arch emotioncy	When an individual has done research to get additional information.

Note. Adapted from "Conceptualizing Sensory Relativism in Light of Emotioncy: A Movement beyond Linguistic Relativism," by R. Pishghadam, H. Jajarmi, and Sh. Shayesteh, 2016, *International Journal of Society, Culture & Language*, 4, p. 4. Copyright 2015 by IJSCS.

An examination of various pedagogical techniques utilized to choose the specific words to be instructed in language classrooms has confirmed that these patterns have gravitated to the individuals' intellectual diversities and social prerequisites. However, the investigation of learners' emotional diversities as an essential factor in the success of language learners has been ignored to a great extent (Pishghadam & Shayesteh, 2016). Regarding this issue, Pishghadam et al. (2013) and Pishghadam et al. (2013) concentrated on the sort and level of emotions diverse learners have toward various words, asserting that these emotions provoked by the lexicon lead learners to achieve an in-depth knowledge of the word.

Consequently, capitalizing on Greenspan's DIR, Pishghadam et al. (2013) offered a novel emotion-based approach in the realm of L2 teaching to lighten the heavy load of vocabulary learning by paying attention to the emotions learners carry with them from their L1. On the basis of this approach, they introduced the term emotioncy, via Emotion-Based Language Instruction (EBLI), as a significant feature that could control the salience of a vocabulary item for the purpose of teaching (Pishghadam & Shayesteh, 2016). Further, believing that words bear an affective dimension (Greenspan, 1992), Pishghadam et al. (2013) and Pishghadam et al. (2013) broached the concept of emotioncy as a potential basis for the fact that words bearing higher emotional responses would be acquired faster and also more easily than words bearing lower emotional responses.

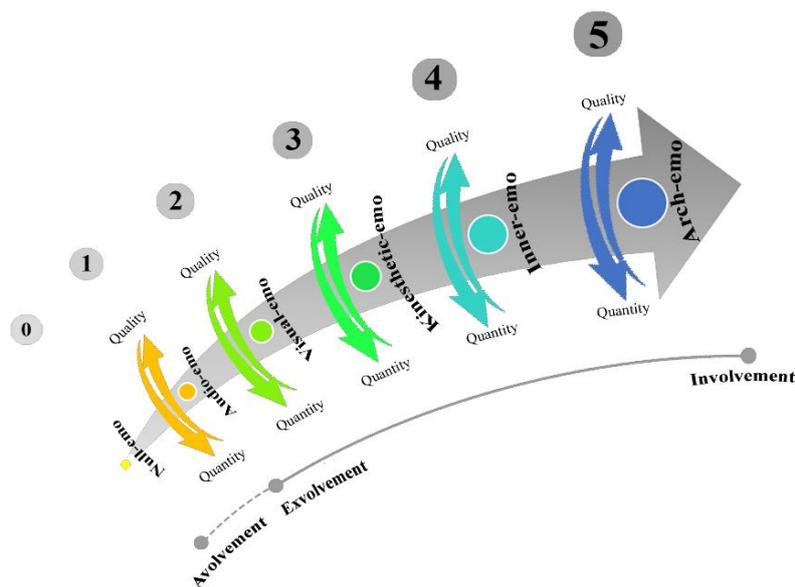


Figure 1. Emotioncy levels. Adapted from "Emotioncy in Language Education: From Exvolvement to Involvement" by R. Pishghadam, 2015, October, Paper presented at the 2nd Conference of Interdisciplinary Approaches to Language Teaching, Literature, and Translation Studies. Iran, Mashhad.

In essence, while in the process of L1 acquisition, “word” (semantic aspect of language) and “world” (pragmatic aspect of language) are simultaneously acquired, during the L2 learning procedure, one already possesses the “world” information from their L1 and only lacks the pertinent “word”. For this reason, individuals seem to learn better and easier the words equivalent to their L1 vocabulary items as a result of having the emotional background knowledge. Accordingly, in order to explain the reason for the delay in the language learning process, Pishghadam et al. (2013) and Pishghadam et al. (2013) put forth the idea of inter-emotionality and stated that, besides the flow which exists between the L1 and L2 in terms of lexicon and grammatical rules, emotions constantly move between the two languages. That is to say that when the emotional flow is from first to second language, learners have the “world” but lack its relevant “word”. In contrast, when this emotional flow moves from second to first language, learners may lack both the “word” and the “world” (Pishghadam & Shayesteh, 2016). Regarding teaching vocabulary as a domain of common concern among almost all language teachers, emotioncy offers an alternative choice to language teachers to enjoy emotional vocabulary instruction (Pishghadam & Shayesteh, 2016). Accordingly, this study aimed to seek the effectiveness of the emotioncy-based language instruction on the LTM vocabulary retention of Iranian EFL learners at the intermediate level of English proficiency.

Methodology

Participants

From among 80 EFL learners who took the pretests, using convenience sampling, a sample of 32 (26 females, 6 males) was selected for the purpose of the current study due to their pretests' results. The participants ranged between 18 to 30 years of age ($M= 22.1$, $SD=3.3$) and belonged to various socio-economic status. They majored in diverse fields of study such as architecture, psychology, translation studies, English literature, and agriculture. All of them scored 30 to 44 in the Oxford Quick Placement Test indicating to be at the intermediate level of English language proficiency. Another criterion for choosing the participants was their unfamiliarity with the vocabulary items to be taught in the instruction session (i.e., having null emotioncy toward the target words). Additionally, all of them were normal in terms of the anxiety scale having either mild or moderate level of trait anxiety. They were neurologically healthy and their working memory score ranged from 10 to 13 (out of 17, which is the highest score in this test, $M= 11.5$). None of them were neophobic and they were all

willing to taste new foods. It is worth mentioning that the participants took part in this research according to their willingness to participate and received either partial course credits or practical gifts, namely flash memory, car lighter charger, power bank, and bluetooth speaker.

Target Words

Since it is believed that senses have a pivotal role in relativizing human cognition (Pishghadam et al., 2016), there was an attempt to choose vocabulary items which were totally unfamiliar to the participants. That is, the participants had neither word nor world knowledge of the target words to be taught holding null emotioncy toward them. To meet this end, initially a list of 48 items composed of the names of some sort of edible things (i.e., fruits, plants, and vegetables) was culled by the researchers. After that, these words were inserted into the validated model of emotioncy scale (Borsipour, 2016) and randomly administered to 150 respondents who were university students of different majors. Upon the completion of the questionnaires, nine of the words, toward which all the respondents had null emotioncy, were chosen as the target ones to be instructed. The target words were mangosteen, longan, physalis, caper, rambutan, salak, sorrel, cranberry, and quinoa.

Instrumentation

Emotioncy Scale

In order to probe the emotioncy kind of the participants (i.e., null, auditory, visual, kinesthetic, inner, and arch) and as a result to determine their emotioncy type (i.e., avolvement, exvolvement, and involvement) towards the words selected for instruction, the validated model of emotioncy scale by Borsipour (2016) was utilized. It included nine words considered to be unfamiliar to the participants. Each item measured the participants' familiarity with the words through a 6-point Likert scale with 1) *not familiar*; 2) *heard*; 3) *heard and seen*; 4) *heard, seen, and touched*; 5) *heard, seen, touched, and used*; and 6) *heard, seen, touched, used, and done research on*. Borsipour (2016) reported the reliability coefficient of the emotioncy scale model .86. To underpin the validity of the model, goodness of fit indices (i.e., χ^2/df , GFI, CFI, and RMSEA) were all shown to be within the acceptable range.

Neophobia Scale

To get informed of the participants' willingness to try new things and to measure their probable inclination to reject novel foods, the Neophobia Scale (Pliner & Hobden, 1992) was utilized. It is a 7-point scale ranging from *extremely low* to *extremely high* composed of two

parts of Food Neophobia Scale (FNS) and General Neophobia Scale (GNS) with 10 and eight items respectively. Pliner and Hobden (1992) maintained that the subject's scores on the Neophobia Scale could highly predict their behavioral responses to new foods (61%) and reported a good internal consistency for the scale ($\alpha = .88$). In the current study, the Cronbach alpha coefficient for the scale was .87.

Oxford Quick Placement Test

To ensure the homogeneity of the participants in terms of their English language proficiency level, the Oxford Quick Placement Test (Allan, 1992) was administered. The test comprises two parts: part one and part two which contain 40 and 20 items respectively. The items are presented in multiple choice and cloze test formats and the allocated time for responding to the questions is 30 minutes. In this test, the obtained scores of 30 to 44 represent intermediate proficiency level in English; in this study, the participants' test scores were all within this range.

Wechsler Adult Intelligence Scale (WAIS)

The WAIS-IV (Wechsler, 2008) provides an overall score of general intellectual ability referred to as the Full Scale Intelligence Quotient (FSIQ). It is comprised of four parts: verbal comprehension, perceptual reasoning, working memory, and processing speed. Wechsler (2008) reported the reliability coefficients of the scale subtests included in the core battery .81 or greater and of the composite of all four scores as the FSIQ .98. Besides, the scale co-normed with a variety of alternative measures to investigate both convergent and discriminant validity indicated high correlations with other measurement tools purported to assess similar constructs (.83 to .91). Of note, for the purpose of this study, just the working memory part was administered to the participants. The working memory subtest includes digit span, which measures immediate rote recall, memory span, and reversibility.

Spielberger's State-Trait Anxiety Inventory (STAI)

The STAI (Spielberger, Gorsuch, & Lushene, 1970) was used to measure the participants' trait as well as state anxiety before the vocabulary instruction session. The scale is consisted of two parts of state and trait anxiety with 40 items (20 items in each part). The items rating state anxiety are based on a Likert scale ranging from *not at all* to *very much* at four levels; and the items related to trait anxiety range from *almost never* to *almost always* at four levels. In this study, the Persian version of the inventory (Mahram, 1993) was utilized to avoid any confusion for the participants. Mahram (1993) reported the validity of .99 and .95, and the internal

consistency of .9 and .91 for trait and state anxiety scales respectively. In the present study, the Cronbach alpha coefficient was estimated as .89 for trait and .93 for state anxiety scale.

Retention Test

To measure the LTM vocabulary retention, the participants were supposed to write as many vocabulary items as they could recall on a piece of paper, two weeks after the instruction of the target words. The participants were also asked to write whatever they could remember about the definition of the words. No time limit was allocated for doing the test.

Procedure

Following the pretests, 32 learners were selected to participate in the study. Subsequent to the selection of the participants who had complied with the requirements of the study, they were randomly assigned to three groups to which the target words were taught according to different emotioncy types. To explicate, first, the nine target words were categorized into three groups of three, that is, three words in the avolvement category, three in the exvolvement category, and three in the involvment category. Then, these categories were arranged in a way that all the participants received all three types of emotioncy-based instruction with all of the nine vocabulary items (see Table 2).

Table 2. *Three Groups of Participants Receiving the Entire Target Words through All Emotioncy Types*

Emotioncy types	Group 1	Group 2	Group 3
Avolvement	Received no instruction ↓	Received no instruction ↓	Received no instruction ↓
	Cranberry Caper Mangosteen	Physalis Sorrel Salak	Rambutan Longan Quinoa
Exvolvement	Received auditory, visual, and kinesthetic instruction ↓	Received auditory, visual, and kinesthetic instruction ↓	Received auditory, visual, and kinesthetic instruction ↓
	Rambutan Longan Quinoa	Cranberry Caper Mangosteen	Physalis Sorrel Salak
Involvement	Received inner and arch instruction ↓	Received inner and arch instruction ↓	Received inner and arch instruction ↓
	Physalis Sorrel Salak	Rambutan Longan Quinoa	Cranberry Caper Mangosteen

Then, the participants attended a one and a half-hour class in which the target words were taught through emotioncy-based language instruction approach by one of the researchers. Before the start of the instruction, the participants were asked to fill out the state anxiety scale to make sure that they are in the proper mood. The instruction session was accompanied by a PowerPoint presentation as well as a learner's pamphlet in which the learners could find the words' spellings with or without their pictures. In each group, three of the target words were not taught at all (i.e., the avolvement category). Three of the words were taught through auditory, visual, and kinesthetic instruction (i.e., the exvolvement category). In this category, the learners received just auditory instruction for one of the words which they were supposed to imagine what it looked like; they received auditory and visual instruction for another word; and auditory, visual, and kinesthetic instruction for the third one. The other three words were taught via inner and arch emotioncy instruction (i.e., the involment category). In this category, the participants were presented with the fruits, plants, or vegetables taught to them and they could taste them and also search the net to get more information about them. The web pages they could open were the same for all of the participants. It should be noted that there was an attempt to keep the allocated time to the instruction of each word the same regardless of the type of emotioncy they were receiving.

Afterwards, the participants were asked to read the same number of sentences for each of the nine target words from which six were taught (36 sentences for each word) and to mark them as true, false, or not known. The purpose of doing so was to expose the learners to the words of all three categories of avolvement, exvolvement, and involment to the same degree. Finally, after two weeks, the retention test was given to the participants. They were asked to use their own memory and had as much time as they wanted to write whatever they could remember of the words presented to them in the instruction session. Figure 2 shows an overview of the procedure of the study.

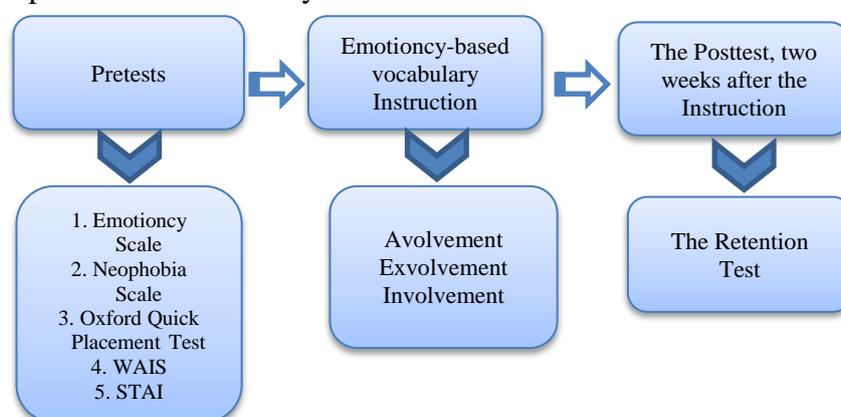


Figure 2. An Overview of the Procedure of the Study

Results

The aim of this study was to investigate the effect of the emotioncy-based language instruction on the LTM vocabulary retention of EFL learners. Two weeks after the instruction session, they took the retention test. The descriptive statistics related to the three types of emotioncy scores are presented in Table 3. As it can be seen, the minimum number of the words that the participants could remember after two weeks was 0 and the maximum was 3 out of 3 in each category.

Table 3. *Descriptive Statistics for Retention Test Scores for Each Emotioncy Type*

Emotioncy	N	Minimum	Maximum	Mean (SD)
1 Avolvement	32	0	1	.03 (.18)
2 Exvolvement	32	0	3	1.25 (1.11)
3 Involvement	32	0	3	2.22 (.83)
Valid N (listwise)	32			

To analyze the data, first, the normality of the distribution of scores of the retention tests was assessed for the whole sample. The results of the Kolmogorov-Smirnov as well as the Shapiro-Wilk statistics indicated the normality of the data with the significance values of .2 and .15 respectively ($p > .05$). Then, in order to compare the scores of each participant exposed to the three emotioncy-based instruction conditions (i.e., avolvement, exvolvement, and involvement), a one-way repeated measures ANOVA was employed.

The results of the multivariate tests (Table 4) indicate that there was a significant effect for the emotioncy types via which the learners received the instruction (Wilks' Lambda = .12, $F(2, 30) = 100.92$, $p < .00$). Furthermore, the partial eta squared statistics show that 87% of the variance in the scores is explained by the kind of emotioncy-based instruction they receive for the target words suggesting a very large effect size based on the guidelines proposed by Cohen (1988).

Table 4. *Multivariate Tests to Compare Retention Test Scores Regarding Each Emotioncy Type*

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Pillai's Trace	.87	100.92	2	30	.00	.87
Wilks' Lambda	.13	100.92	2	30	.00	.87
Hotelling's Trace	6.73	100.92	2	30	.00	.87
Roy's Largest Root	6.73	100.92	2	30	.00	.87

Upon obtaining statistically significant differences among the 3 emotioncy-based instruction types, pairwise comparisons was conducted as a post-hoc test for repeated

measures ANOVA to find where the statistical significance lies. Bonferroni adjustment to the alpha level was used to protect against type 1 error. Table 5 compares each pair of emotioncy-based instruction type and displays that each of the differences is significant ($p < .05$).

Table 5. *Pairwise Comparisons to Compare Retention Test Scores Regarding Each Emotioncy Type*

(I) Emotioncy	(J) Emotioncy	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
Avolvement	Exvolvement	-1.22	.20	.00	-1.74	-.70
	Involvement	-2.19	.15	.00	-2.57	-1.80
Exvolvement	Avolvement	1.22	.20	.00	.70	1.74
	Involvement	-.97	.21	.00	-1.50	-.44
Involvement	Avolvement	2.19	.15	.00	1.80	2.57
	Exvolvement	.97	.21	.00	.44	1.50

As the results of the study reveal, the type of emotioncy-based instruction for each of the target words received by each participant has a significant effect on the LTM retention of those words. Additionally, the findings exhibit a greater retention rate in favor of the involvement emotioncy type compared to the exvolvement and avolvement ones. Thus, regarding the retention of the target words, the results can be summarized as:

Involvement > Exvolvement > Avolvement

Discussion

Emotions have a considerable effect on the human beings' cognitive processes such as attention, learning, perception, memory, and reasoning (Swain, 2013). Given that emotions facilitate the efficient encoding and retrieval of information (Pekrun, 2014; Tyng, Amin, Saad, & Malik, 2017), this study examined emotioncy-based language instruction to find out the effect of sense-induced emotions, through emotionalizing learners toward a set of novel vocabulary items, on their LTM retention of the new words.

Capitalizing on the concepts of sensory relativism, ESQ, embodied cognition, and multisensory learning, this study explicated the significance of senses as the main gears that produce emotions and shape the human cognition. Accordingly, it was hypothesized that as a result of the sensory experiences the learners obtain in the classroom, their learning quality will be enhanced, leading to a better retention of the newly acquired words (see Figure 3).

To test this hypothesis, nine new words were selected by the researchers of this study and taught to the participants, who had neither word nor world knowledge about them, utilizing their different senses to help them experience all emotioncy types toward all the selected words (avolvement, exvolvement, and involment). The results demonstrated better LTM retention of the words that were acquired through the use of more senses in the hierarchy of the emotioncy model. In other words, two weeks after the instruction, the items that were taught according to the conventional practices of vocabulary teaching (exvolvement) were less retained by the learners than those taught by the engagement of more senses (involment) in the process of learning.

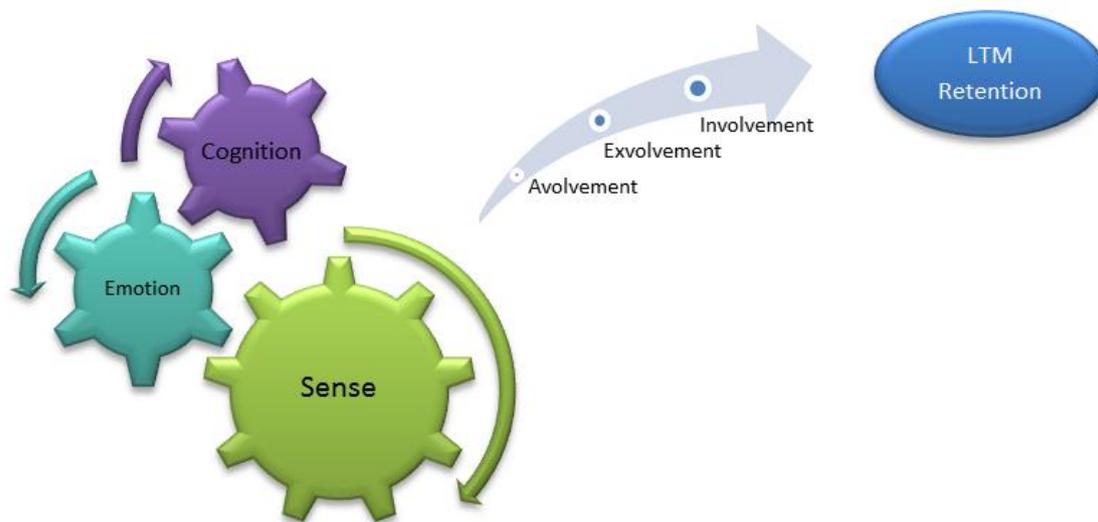


Figure 3. *The Relationship among Senses, Emotions, and Cognition and the Impact of their Interaction on LTM Retention*

The findings of this study are a good corroboration of the benefits of multisensory learning and the technique of “the education of the senses” as the major aim of pedagogy (Gutek, 2004). The results are also in line with those of behavioral studies (Lehman & Murray, 2005) that have indicated that multisensory experiences enrich perception and learning, and facilitate the retrieval of the encoded sensory experiences from memory. Moreover, the results underpin the claim of the embodied cognition paradigm that senses are assuming a critical role in cognition (Shapiro, 2007) and enhance retrieval from memory as a result of the interaction of the body with the environment.

A likely reason for the obtained results also adjusts to the viewpoint of neuroscience and cognitive psychology that emotionalization causes the learners’ brains to release dopamine in the prefrontal cortex which is responsible for such higher brain functions as thinking and reasoning. The release of dopamine activates the neural firing of the brain cells,

which in turn increases the learners' motivation and interest in learning the new items (Geake, 2009). On the other hand, if the learners are not emotionalized enough towards the new vocabulary items, they will lose their interest affecting their motivation and wandering their attention. As several neuroscience studies have indicated, in perception, the selective attention is mediated by processing within the sensory pathways (Vuilleumier, 2005). In other words, if the learners be guided to focus their attention on the sensory input which is valuable to attend to at a particular point in time, that input will enter the pathway through the prefrontal cortex (Willis, 2009) and their learning is enhanced leading to a longer retention of the materials; otherwise, the learners will no longer be focused and their learning is inhibited.

The recent bulk of brain research supports the position that emotions induced by senses are an integral part of cognition and learning. In fact, advances in technology have enabled researchers to investigate the activity of the normal brain as it is engaged in a specific task such as a lexical decision task by non-invasive imaging techniques such as electroencephalogram (EEG) and magnetic resonance imaging (MRI). Neuroscience is now mapping out senses and their evoked emotions as a significant learning component and releasing groundbreaking research concerning the link between emotions, cognition, and learning (Rager, 2009).

Conclusion

It is worth noticing that the connection between brain development and the processing of the sensory input coming from nerve endings in organs like skin, eyes, ears, mouth, and face develops based on the nature and quality of the stimuli in the learning environment (Striedter, 2006). Therefore, it is recommended that language teachers reflect on their dominant approach to the instruction of new vocabulary and avoid communicating their subject matter in a sensory-deprived learning environment. As the findings of this study indicate, emotioncy-based language instruction is quite beneficial in enriching the students' sense-induced emotions in language classes, resulting in enhancing their LTM retention of the new vocabulary items.

The findings of this study can contribute to a more promising achievement in vocabulary learning by EFL learners as a result of enhancing their awareness of the value of emo-sensory intelligence in informing the foreign language learning. Moreover, the results can be beneficial to the Board of Education in developing curricula for language courses that entail the efficient use of sensory inputs in teaching and learning foreign languages. Finally,

it is hoped that this study will promote a deeper understanding of the importance of human senses in learning. In light of emotioncy-based language instruction, it puts forward a more effective way of teaching new vocabulary to overcome the common concern of language teachers as to the retention of the new words.

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