

The impact of emotionally competent stimuli on language lexis retention

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Abstract

The objective of this study was to determine whether or not positive emotional stimuli enhance the learning of new foreign language vocabulary among learners with different learning styles. The stimuli were presented in English classes to the experimental group for eight weeks. Vocabulary knowledge was tested in the control and experimental groups before and after the intervention. Participants' learning styles were detected by a validated questionnaire. The findings revealed an increase of vocabulary knowledge among all participants, with nearly double the improvement in the experimental group. The highest vocabulary increase was detected among learners with a musical learning style.

Key words: foreign language, vocabulary, teaching, emotions, positive stimuli, learning styles

Introduction

The primary aim of foreign language vocabulary learning is to move words from short-term to long-term memory (Davoudi, Yousefi, 2016). In this process, memory can be aided to hold and recall the lexis in many ways. Authenticity, context, personalization, and usefulness of foreign language vocabulary are widely known to promote its learning (Merrill, Barclay, van Schaak, 2008). Recently, affective depth has been considered an effective memory aid (Thornburry, 2002). In the context of foreign language learning, increasing attention is paid to positive psychology (Fredrickson, 2001), emotional experiencing (Dewaele, MacIntyre, 2014; Kamenicka, Kovacicikova, 2019), and emotion-involved processing within the Emotion-Involved Processing Hypothesis (Kanazawa, 2021) or the Apple Tree Model of Emotion-Involved Processing (Kamenicka, 2021). Both theories concur that emotionally enhanced learning operates on a deeper processing level than perceptual and semantic processing, which leads to better long-term information retention (Truscott, 2015).

Learning Styles

Learning style can be defined as a more or less consistent way in which people prefer to perceive, organize, and process information (Kaminska, 2014). A half-century of research into learning styles has shifted from the traditional paradigm of stable individual learning differences towards “stable-yet-flexible” (Oxford, 2011: 40) characteristic adaptations of learners (Dörnyei, Ryan, 2015). Despite conceptual confusion and a plethora of models and instruments (Coffield, 2004), the psychological construct of learning styles based on the types of intelligences (Gardner, 1993; Davis, Christodoulou, Seider, Gardner, 2011) remains one of the most popular (McKenzie, n.d.):

- Visual/spatial – learning visually and organizing ideas spatially, able to recognize and manipulate large-scale and fine-grained space images.
- Verbal/linguistic – learning through the spoken and written word, able to analyze information and create products involving oral and written language;
- Mathematical/logical – learning through reasoning and problem solving, able to develop equations and proofs, make calculations, and solve abstract problems;

- Bodily/kinesthetic – learning through interaction with one’s environment, able to use one’s own body to create products or solve problems;
- Musical/rhythmic – learning through patterns, rhythms, and music, able to produce, remember, and make meaning of different patterns of sound;
- Intrapersonal – learning through feelings, values, and attitudes, able to recognize and understand one’s own moods, desires, motivations, and intentions;
- Interpersonal – learning through interaction with others, able to recognize and understand other people’s moods, desires, motivations, and intentions;
- Naturalist – learning through classification, categories and hierarchies, able to identify and distinguish among different types of plants, animals, and weather formations that are found in the natural world.

However, learning styles rarely occur in isolation; they are mostly blends of two or three. Fleming (2012) claimed that approximately 50% of secondary school and university students prefer “blended” learning styles. The variation of activities and a multisensory approach using more than one modality is thus a great help for learners of different learning styles. Recent research results confirm that teaching with multiple intelligences positively affects learning motivation and achievement (Lei, Cheng, Chen, Huang, Chou, 2021). Moreover, a mental picture painted through multisensory experiences is far more effective in recalling information (Gallo, 2014; Mayer, 2005). According to the Dual Coding Theory (Paivio, 1986), the ability to code a stimulus in different ways (verbal associations and visual imagery) increases the chance of remembering it – when compared to the situation of one-way coding.

However, to deliver a multisensory experience to learners can be demanding and time-consuming for a teacher. Due to the fact that the learning styles of learners in one class can greatly vary, it is not always possible to engage every learner in an activity that would suit their learning style. Nevertheless, every learner in the class is able to feel emotions. We consider emotions as a way of communication, which can be understood by every learner with any possible learning style or combination of learning styles. Purportedly, emotional engagement might be a universal key to the problem of how to engage learners of different learning styles at the same time (Kamenicka, Kovacicova, 2019).

Emotional Stimuli in Vocabulary Learning

Our brains constantly perceive thousands of sensory inputs, and the reticular activating system, sensitive to anything with personal relevance and novelty, sorts out which input is worth further processing (Kelly, 2015). The way we perceive information thus affects how easily we remember it. The information which brings us emotional excitement is remembered with more clarity than that which we consider as neutral (Greenspan, Shanker, 2004; Medina, 2008).

Emotionally competent stimuli (Gallo, 2014) or emotionally charged events (Dornyei, Ryan, 2015) apply all kinds of sensory experiences and the sense of novelty (Kamenicka, Kralova, 2021). They arise through engagement in a learning task (Oga-Baldwin, 2019), trigger emotional arousal, and thus create not only memories of events or objects but also of accompanying emotional sensations (Greenspan, Benderly, 1997). Thanks to dopamine, emotionally competent stimuli persist in memory longer and are recalled with greater accuracy – when compared to “neutral” memories.

Nonetheless, several researchers report that the retrieval of input can be facilitated by trying to create the positive mood experienced during encoding (Bower, 1981; Singer, Salovey, 1988). As (Thornburry, 2002: 29) emphasizes, “affective (i.e. emotional) information is stored along with cognitive (i.e. intellectual) data, and may play an equally important role on how words are stored and recalled.” He adds that a high degree of attention, or rather, arousal, correlates with the improved recall of vocabulary items. However, relatively few authors have worked with emotion-

inducing stimuli in foreign language learning applying mostly visual or audiovisual materials (e.g., Matsumoto, Consolacion, Yamada, Suzuki, Franklin, Paul, Ray, Uchida, 2002; Gregersen, MacIntyre, Meza, 2016; Mavrou, Dewaele, 2020). Such studies focused on participants' perceptions of the stimuli and their well-being rather than foreign language outcomes.

Li, Fan, Wang (2020) examined the effect of post-encoding positive emotions in the form of video stimuli on associative memory for English vocabulary, and Kamenicka, Kralova (2021) involved multisensory positive emotional stimuli in both new vocabulary learning and learners' well-being, applying a mixed-method approach in a longitudinal design. Kamenicka, Kovacikova (2019) determined that positive emotions eliminated boredom, were motivating (even to reluctant learners), and timesaving in terms of vocabulary learning. The learners also claimed that emotional stimuli provided the lexical items with a logical sequence and context, which they often miss in foreign language textbooks, and thus made the comprehension of a new lexicon much easier.

Vocabulary is considered the most salient aspect of communication (Schmitt, 2000; Thornburry, 2002), and both researchers and learners recognize its importance in foreign language learning. Vocabulary is considered a collection of accumulated items, while grammar is viewed as a system of rules, which can be reapplied (Thornburry, 2002). However, knowing only the meaning of words (declarative, receptive, or passive knowledge) is insufficient for communicating effectively. It is necessary to transform the lexicon into active (procedural, productive) knowledge to be able to use it in communication (Thornburry, 2002; Gondova, 2012). In the current study, only declarative vocabulary learning was analyzed, because only eight weeks of learning limits vocabulary proceduralization.

To the best of the authors' knowledge, there have not yet been any longitudinal studies involving multisensory positive emotional stimuli as an intervention specifically aimed at learning foreign language vocabulary related to different learning styles.

Methodology

Objectives

It has already been proven that the knowledge of declarative vocabulary is higher among learners who experience positive emotional stimuli during learning than among learners who do not experience them (Kamenicka, Kralova, 2021). The primary objective of this study was to determine whether or not positive emotional stimuli increase the learning of new foreign language vocabulary among learners with different learning styles.

The standardized Learning Styles Questionnaire based on the Multiple Intelligence Inventory (McKenzie, n.d.) was applied before the intervention to find out the dominant learning style of each participant. The questionnaire contains 80 items and detects the learning styles according to the prevailing type of intelligence and attitude towards learning. The styles are evaluated on a 10-point scale with a higher score indicating a higher tendency towards the given style.

Vocabulary learning was measured by an identical test before and after eight seminars developing English communicative competence (90 minutes, once a week). The emotional stimuli (10 minutes on average) were applied in the experimental group (EG) once a week. The control group (CG) underwent an identical course schedule but without the application of positive emotional stimuli. The vocabulary test contained 40 items in three types of exercises (translation, fill-in-the-blank, and paraphrasing), which were selected from the vocabulary contained in the seminars. Based on the authors' teaching experiences, the items not previously known by the participants were selected from the vocabulary. Each correct item was scored with 1 point, and the maximum score was 40 points.

In the pre-test, it was intended to find out what percentage of the target vocabulary is included in participants' declarative knowledge. The post-test was administered after the application of the emotional stimuli to detect an increase in declarative vocabulary, which was related to the preferred learning style of each participant. Furthermore, we compared the results obtained in the experimental and control groups using descriptive statistics in the program Statistica 9.0 Standard Plus CZ (2009). Taking into account these facts, the following research question was formulated: Which learning style is associated with the most significant increase of declarative vocabulary knowledge after the application of positive emotional stimuli?

Participants

A total of 71 non-native (Slovak) first-year university EFL students were selected by convenience sampling and randomly subdivided into the experimental group (EG = 40 students) and the control group (CG = 31 students). They were between 18-19 years old, and their level of English proficiency was B1-B2 (Council of Europe, 2001). All participants provided written informed consent.

Intervention

Both groups discussed the same topic each week (Places to Live; Hobbies and Lifestyle; Sports and Games; Culture and Art; Society, Science and Technology; Communication and Media; Education and Work). The seminars followed an identical lesson plan: warm-up discussion, presentation of a topic, practice activities focused on receptive language skills, and practice activities focused on productive language skills. During the lesson, a topic-related emotional stimulus was presented in the form of narratives, videos, music, sounds, games, competitions, physical activity, and arts and crafts in the experimental group for 10 minutes on average (for more details about the emotional stimuli, see Kamenicka, Kralova, 2021).

Results

Learning Style Questionnaire

The Wilcoxon Rank Sum Test proved that the average scores reflecting participants' preferred learning styles were similar in both groups, and their differences were statistically insignificant at $\alpha = 0.05$ ($p > 0.05$) (Table 1).

Table 1. Results of the Learning Styles Questionnaire

Learning style	Experimental group		Control group		Wilcoxon Rank Sum Test	
	Mean	SD	Mean	SD	Z	p
interpersonal	2.60	1.52	2.90	2.07	-0.362	0.718
intrapersonal	6.35	1.83	6.16	2.41	0.264	0.792
verbal	4.28	1.43	4.55	1.77	-0.473	0.636
logical	3.83	1.84	3.84	2.00	-0.047	0.962
musical	3.43	1.89	3.55	1.84	-0.229	0.819
naturalistic	3.08	1.61	3.19	2.06	0.236	0.814
kinesthetic	3.83	2.04	3.94	2.38	0.284	0.777
visual	3.58	1.74	3.55	1.55	0.083	0.934

Vocabulary Test

Vocabulary test improvement was calculated as the difference between the pre-test and post-test scores for each participant. A non-parametric one-side Wilcoxon Signed Rank Test proved that the differences in Vocabulary test scores between pre-test (EG: mean = 7.68, SD = 7.06; CG: mean = 7.45; SD = 5.11) and post-test (EG: mean = 18.40, SD = 8.44; CG: mean = 10.66; SD = 5.08) were statistically significant in both

groups. The differences between the groups were statistically significant only in the post-test (Table 2, Figure 1, Figure 2).

As Table 3 displays, vocabulary improvement was higher in the experimental group (mean difference 12.85) than in the control group (mean difference 5.97). In the experimental group, vocabulary knowledge increased most among learners with musical (mean difference 21.63) and interpersonal (mean difference 17.50) learning styles and least among learners with a logical learning style (mean difference 4.63). In the control group, the differences in vocabulary improvement were not so marked between the learning styles. Spearman correlation coefficients (R) achieved between the Vocabulary test improvement and individual learning styles revealed a weak positive correlation ($0.3 \leq |R| < 0.5$) in three types of learning styles (verbal, naturalistic, and visual) in the experimental group and the verbal style in the control group.

Table 2. The differences in vocabulary improvement ($\alpha = 0.05$)

EG (pre- vs. post-test)		CG (pre- vs. post-test)		Pre-test (EG vs. CG)		Post-test (EG vs. CG)	
Z	p	Z	p	Z	p	Z	p
5.316	0.000*	4.389	0.000*	-0.771	0.439	2.639	0.008*

*statistically significant value

Table 3. Vocabulary improvement and its correlation with learning styles (R)

Learning style	Experimental group			Control group		
	Mean	SD	R	Mean	SD	R
interpersonal	17.50	2.03	-0.086	4.00	1.24	0.210
intrapersonal	11.21	0.94	0.244	5.75	1.08	-0.107
verbal	11.83	1.61	0.395*	7.61	1.57	0.397*
logical	4.63	0.59	0.271	6.10	1.15	0.005
musical	21.63	1.51	0.215	5.00	1.18	0.229
naturalistic	13.00	1.27	0.456*	8.50	0.95	0.026
kinesthetic	10.00	1.13	0.038	4.80	0.84	0.085
visual	13.00	1.75	0.360*	6.00	1.02	0.266
Total	12.85	2.01		5.97	1.13	

* statistically significant value

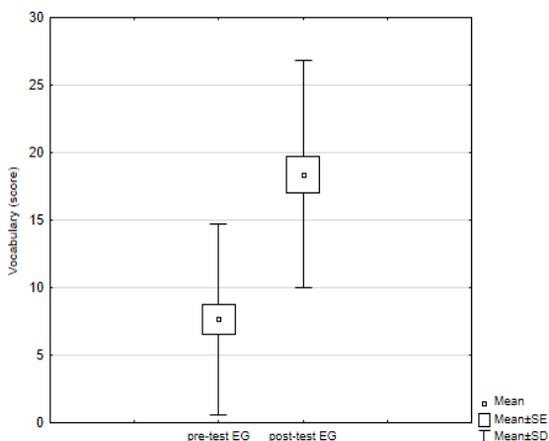


Figure 1. Vocabulary improvement in the experimental group

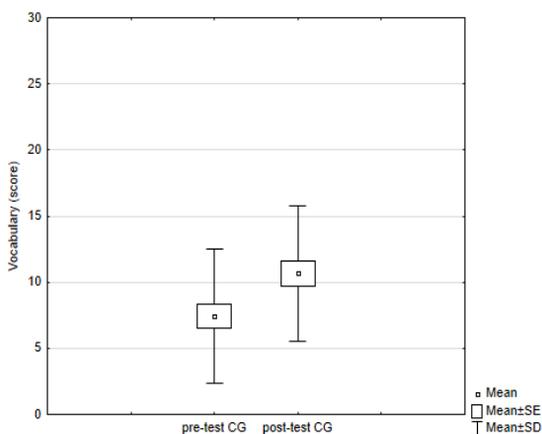


Figure 2. Vocabulary improvement in the control group

Table 3. Vocabulary improvement and its correlation with learning styles (*R*)

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* statistically significant value

Discussion

The beneficial effect of positive emotions on learning has already been proven (Kamenicka, Kralova, 2021). The current findings lend support to emotionally enhanced learning theories (Thornburry, 2002; Truscott, 2015). Positive emotional stimuli might be even more versatile than multisensory learning, as they help personalize language learning for learners with all learning styles. Moreover, positive emotions promote not only learning but also an overall well-being of learners as it has been demonstrated by several other studies (e.g., Matsumoto, Consolacion, Yamada, Suzuki, Franklin, Paul, Ray, Uchida, 2002; Kamenicka, Kovacikova, 2019; Mavrou, Dewaele, 2020). The feedback interview in the experimental group supported these findings – all the learners liked the stimuli and would have appreciated more of them in the classes. Most of the learners thought the implemented emotional stimuli had helped them remember new vocabulary mainly because they were fun and incited creativity and associations.

Vocabulary knowledge increased among learners with all learning styles, the improvement being nearly twice as high in the experimental group. Learners who profited most from the intervention were those often neglected in traditional language classes emphasizing the cognitive aspect of learning – learners with a musical learning style identifying patterns through the senses, and learners with interpersonal style learning through interaction with others (McKenzie, n.d.). What is more, the intrapersonal learning style with a significant affective component of learning dominated in the whole sample of learners (n = 47). In both groups, a direct relationship (the higher the style score, the higher the vocabulary improvement) was detected among learners with a verbal learning style, which probably corresponds to the character of the course focused on speaking skills. Linguistic learners internalize information through language, enjoy learning new words and using language creatively (McKenzie, n.d.).

Emotional stimuli thus seem to be a suitable complement to other teaching techniques in dealing effectively with learning styles. Moreover, emotional stimuli are easily applicable and transferable across diverse cultural and language contexts. The current research supports the dynamic and interactive conceptualization of learning styles (Dorney, Ryan, 2015). More than one learning style was detected as dominant in one-third of the participants, and the scores indicating learners' preferred style were rather diverse (from 4 to 10). Learning style preferences thus seem to be a continuum, responsive to the environment, where the range of individual differences should be considered. Nevertheless, its value judgment will be a challenge for further research.

Conclusions

Applying affective intervention in the form of positive emotional stimuli is in line with the current trends in foreign language pedagogy, which utilize psychological methods and techniques to make learning more effective and enjoyable. Emotional stimuli are positively perceived by the learners, which can enhance their motivation and learning. Regarding the multisensory approach, emotional engagement might be considered as a means to engage learners of different learning styles. This is especially true of teenage learners, who are eager to learn about topics they find interesting and useful, who are interested in real-life experiences and authentic learning opportunities, and who favor active over passive learning (Kellough, Kellough, 2008). For more generalizable outcomes concerning the role of emotions in foreign language learning from a neuroscientific and positive psychological perspective, further research would be beneficial.

Hopefully, this study will provide more empirical data for the research of emotions in teaching foreign languages. However, the findings should be interpreted in the light of several limitations. The first one is the space limit, which precluded publishing data

on all parts of the experiment in a single article. The study presents partial data from a larger longitudinal study, and collectively the data gathered could offer additional perspectives on the issue. The second limitation is the small sample size. Although the groups showed clear tendencies in the data, larger groups to be included during the experiment may allow group distinctions to emerge more clearly. Further, it was not possible to explore changes after a longer period of intervention, as the university courses are limited to a 12-week period in Slovakia. Future research may want to verify the optimum length of the intervention for foreign language learners. In spite of these limitations, it is hoped that another small step has been taken towards a greater understanding of emotions in foreign language teaching and learning.

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