

# Emotion-memory effect in Croatian-English bilinguals

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Ečim, Lucija

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Department of English  
TEFL Section

**EMOTION-MEMORY EFFECT IN CROATIAN-ENGLISH BILINGUALS**

Graduation Thesis

Student: Lucija Ečim

Supervisor: Asst. prof. Stela Letica Krevelj, PhD

Zagreb, 2022

Sveučilište u Zagrebu  
Filozofski fakultet  
Odsjek za anglistiku  
Katedra za metodiku

**UTJECAJ EMOCIONALNOSTI NA PRISJEĆANJE KOD GOVORNIKA HRVATSKOG  
I ENGLESKOG JEZIKA**

Diplomski rad

Student: Lucija Ečim

Mentor: doc. dr. sc. Stela Letica Krevelj

Zagreb, 2022.

**Examining Committee:**

Assoc. prof. Renata Geld, PhD

Jasenka Čengić, MEd, teaching and research assistant

Asst. prof. Stela Letica Krevelj, PhD

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## **Abstract**

Bilinguals' perception of word emotionality changes in accordance with the languages they speak. Native language generally feels more emotional and more intense, but the emotional gap between the two languages does not always have to appear, as emotional attachment depends primarily on bilingual's knowledge of second language and the age of its onset. The purpose of this study, thus, was exploring the effect of words' emotional quality on their memorization, also known as the emotion-memory effect, and the way it differs in first and second language of a bilingual speaker with similar knowledge of both languages. The research survey consisted of three parts: participants' background information, rating of the emotionality of words in Croatian and English language, and a word recall. The study participants were 87 Croatian university students majoring in the English language and the data was collected by a web questionnaire shared through social media. The findings were analyzed quantitatively and, after comparing word rating results with their recall, it was found that emotion-memory effect occurred in both Croatian and English language, and that the level of recall is similar in both languages. Taboo words were memorized most frequently, and along with reprimands and positive words, had stronger recall than neutral words. What was surprising, however, was that neutral and negative words had similar level of memorization. Also, reprimands were recalled better in the second language, even though they are more often expressed in one's native language. This indicates that an emotional reaction to a language does not necessarily have to be conditioned by an individual's past experiences, but it can also be triggered by the novelty of stimuli.

Key words: Croatian-English bilinguals, emotion-memory effect, word recall

## 1. Introduction

Research on bilingualism has so far provided abundant evidence in favor of different emotional impact and emotional involvement of an individual's first (L1) and second (L2) language. Native language is considered to have more emotional force as opposed to the foreign one that is generally used in situations of distancing and detachment (Pavlenko, 2002). Moreover, many researchers claim that words with emotional quality evoke a deeper level of processing than neutral words, which leads to their memorization and, ultimately, better recall (Ayçiçeğy-Dinn & Caldwell-Harris, 2004). This study investigates the two phenomena – the stronger emotionality of words in the first language and superior recall of emotion words as opposed to neutral words – and ways in which they interfere in the mind of a highly proficient adult speaker of L1 Croatian and L2 English language. The research design was based on a study administered by Annooshian and Hertel (1994) and the one conducted by Ayçiçeğy-Dinn and Caldwell-Harris (2004). Both studies brought up some interesting findings concerning the so-called emotion-memory in Spanish-English and Turkish-English bilinguals, but their results were conditioned by different variables, with the most significant ones being the participants' proficiency in both languages, the age in which they started learning English as their L2, quota of word categories included in the questionnaire, and order in which the words were presented. The purpose of this study was, thus, to explore the same effect in Croatian context bearing in mind all the variables that have affected results in previous studies. The participants were bilinguals who are almost equally fluent in both languages – their native Croatian, and their second English language – and all of them started learning English as their L2 early, before or at the age of eleven. The selection of participants was based on the Ayçiçeğy-Dinn and Caldwell-Harris study (2009), whose results show similar emotion memory effect in both first and second language of Turkish students with high proficiency in English language and relatively early age of its onset. Furthermore, the number of negative, positive and neutral items presented in this research questionnaire was equal, while reprimands and taboo words had a smaller count, and the words, as well as the languages, were not presented in any particular order. This way, the study aims to provide new insights concerning the emotion-memory effect in bilinguals by eliminating variables known to have altered the findings of the previous studies.

## **2. Theoretical background**

To provide context for this research study, the following chapter will delve into the topics of bilingualism and emotions, as well as the construct of emotion-memory effect. Previous research that has been done on these topics will follow.

### **2. 1. Bilingualism, emotions and memory**

As our society rapidly progresses in its globalization, bilingualism is becoming more and more common and needed for successful everyday functioning. Bilingual speakers today greatly outnumber monolingual (Wierzbicka, 2004), and English has already established itself as globally spoken language, also known as *lingua franca*.

There are many different definitions of bilingualism. At the very beginnings of research into this phenomenon, theorists like Bloomfield (1933) and Braun (1937) analyzed it mostly in limited terms of monolingualism and claimed it is a native-like mastery of two different languages (as cited in Aronin and Singleton, 2012). Over the time, understanding of bilingualism evolved into a more flexible approach and new hypotheses emerged: a bilingual is a person who has “some knowledge and control of the grammatical structure of the second language” (Hall, 1952, p. 14, as cited in Aronin and Singleton, 2012) or can at least understand it (Edwards, 1994, as cited in Aronin and Singleton, 2012). Bilingualism is sometimes also identified with multilingualism, a concept generally recognized as the ability to speak more than two languages. Some argue that multilingualism is only an extension of bilingualism, while Wei (2000) explained that bilingualism can also refer to the use of several languages and that these two terms can overlap. Similar approach was later adopted by Aronin and Singleton (2012), who stated that multilingualism is the umbrella term for bilingualism. Today, these constructs are examined as two distinct ones with different levels of complexity, each with its own individual characteristics conditioned by different social, psychological and linguistic influences (Yuko, 2012).

Bilinguals can, moreover, be categorized into different types according to factors such as the level of language mastery, language dominance and the age of learning onset. For the purposes of this study, four types of bilinguals will be elaborated here: simultaneous, sequential, early and late bilinguals. According to Pavlenko (2014), a simultaneous bilingual is someone who started learning two languages from very early childhood (before or at the age of three). The term early



bilingual, however, refers to a person who acquired their second language before the age of 12, while late bilingual denotes a person who started learning L2 after that age. Another classification is the one between simultaneous and sequential (successive) bilinguals, with the latter one representing those who learned second language only after their first one has been acquired to some point (Aronin & Singleton, 2012). A sequential bilingual is a more general term and can refer to either early or late bilinguals.

When it comes to language emotionality, it is believed that words in different languages often don't hold the same emotional weight in a mind of a bilingual speaker: a person's native language generally provokes more emotional response than the second one, making it preferred language for discussing more personal topics. At the same time, it has been noted that bilinguals switch to their second language when they are emotionally distancing themselves from the topic and when they are talking about subject matters that don't require too much emotional attachment (Pavlenko, 2002). However, this doesn't have to be the case in all bilinguals, as the way of processing emotions can depend on many different factors, with crucial ones being the age of onset and context of L2 acquisition. According to Dewaele (2013), languages learned later in life, especially those acquired through formal education, trigger less emotion, and are considered to be deficient for expressing one's true feelings and thoughts. The main reason for that is longer processing of words and their meaning, as well as unfamiliarity with sociopragmatic rules of the target language. On the other hand, languages acquired early in life, particularly when learned at home, can evoke similar emotional reactions as L1. This especially applies to simultaneous bilinguals. Nevertheless, early and simultaneous bilinguals can also have preferences towards certain languages when discussing different topics, which is often conditioned by their past experiences and the context in which the specific language was used: they might prefer to use one language for expressing love and other for swearing (Wickham, 2019).

The previous paragraph illustrated main differences in *expression* of emotions in different languages. Emotionality of words in two distinct languages can also have different impact on a bilingual's *memory*. The phenomena in which more emotional words are generally easier to remember is called the emotion-memory effect. According to Ayçiçeğy-Dinn and Caldwell-Harris (2004), superior memorization of emotional words comes from the fact that they usually engage more attention and thus elicit deeper level of understanding than neutral words. So far, this effect

was mostly observed through a recall test that required participants to remember as many words as possible from a list of words they were handed previously. The emotion-memory effect was believed to be stronger in one's native language, which was thought to be more emotional than the second one, as it was first demonstrated in the study by Anoshian and Hertel (1994). However, this was later debunked by Ayçiçeğy-Dinn and Caldwell-Harris (2004), who found out that it can appear in the second language as well, and sometimes even stronger than in the first one. Findings that also go in favor of similar emotion-memory effect in both L1 and L2 are those presented by same authors, Ayçiçeğy-Dinn and Caldwell-Harris, in a 2009 research study tested on Turkish students who were very fluent in English language. Even though participants in 2004 and 2009 studies had different mastery level of their L2, the researchers argued that there was one factor that influenced emotional perception of certain stimuli in both studies – the novelty effect. It was hypothesized that novelty had the greatest influence on the recall of reprimands in L2, as they are generally not uttered in second language during one's childhood. What is interesting here is that the context and age in which reprimands were acquired shows no advantage over instant emotional reaction stimulated by their unusualness and unexpectedness.

## **2. 2. Previous research**

In 1994 researchers Anoshian and Hertel conducted a study on 36 Spanish-English bilinguals who became almost equally fluent in their second language as they were in their native one but started learning the L2 after the age of eight. One half of the subjects were native speakers of Spanish, and the other were native speakers of English – which allowed researchers to draw conclusions concerning bilinguals of different native languages. After the fluency test has been conducted, participants were presented with two tasks. In the first task they had to rate the level of pronunciation ease and implicit activity of words, as well as emotionality of 18 emotional and 18 neutral words in both their respective languages. A surprise recall test was presented to them afterwards. The words were displayed on a monochrome screen, and languages were not mixed, which means participants first rated 18 words from one language, and then 18 words from other language. The authors found that emotional words were recalled more frequently than neutral, but only in the participants' native languages. At the same time, emotional and neutral words were recalled equally in the second language. However, most of emotional words were positive (13 out

of 18), which created somewhat limited ground for generalization concerning the emotion-memory effect.

Anooshian and Hertel's methodology was later adopted by Ayçiçeğy-Dinn and Caldwell-Harris who published extended research in 2004. This time, participants were native speakers of Turkish and relatively late learners of English who were more fluent in their native language. In this study recall was compared to recognition, emotional words were split into negative and positive and anxiety-provoking words and phrases – taboo terms and childhood reprimands – were added to the mix. The study consisted of three different parts: rating the pleasantness of words in both languages, a recall test and a recognition test. After the first part, half of the participants took surprise recall test, and the other half was asked to recognize words they had just rated. Contrary to the results of Anooshian and Hertel's study, the researchers found that emotionality effect was present both in the first and second language. Negative words, taboo words and childhood reprimands were even more frequently recalled and recognized in L2. There were minimal differences in recall of positive words in L1 and L2, but recognition was stronger in L2. Due to participants' lower L2 proficiency, Ayçiçeğy-Dinn and Caldwell-Harris suggested that the novelty and unusualness of stimuli may have influenced their recall and recognition. Languages in their rating task were mixed, which was not the case in the 1994 study, adding to the factor of unexpectedness and unfamiliarity of words. Also, neutral words made only 25 % of the total word count, whereas in the previous research they comprised half of them. All the mentioned could have affected the way in which participants processed presented stimuli, which eventually led to findings that greatly differed from those carried out in Anooshian and Hertel's study.

In 2009 Ayçiçeğy-Dinn and Caldwell-Harris conducted another study consisting of one shallow processing task – letter counting– and three deep processing tasks – emotional-intensity rating, translation, and word association. The purpose of the study was investigating levels of processing in participants L1 and L2 and its effect on a bilingual's emotional memory. The participants were bilingual students, native speakers of Turkish and fluent speakers of English, who started learning their L2 at the age of 12 or 13, and who were randomly assigned one of the four tasks. Although some results differed from task to task, it was once again concluded that the emotion-memory effect can be found in both bilinguals' languages: taboo and positive words had the highest recall, while, surprisingly, the recall of negative was not stronger than the recall of

neutral words. Moreover, childhood reprimands had the most frequent recall in second language – a finding that researchers attributed to the novelty effect. These results indicate that “emotional attributes of words are equally available to boost memory in a first and second language in both shallow and deep processing” (Ayçiğegy-Dinn & Caldwell-Harris, 2009, p. 291).

Another interesting study that examined the connection between emotion and memory was published by Kensinger and Corkin (2003). Although it was not conducted on bilinguals, the study offers a great insight into emotion-memory effect of negative and neutral words through six different experiments. The first two experiments were aimed at examining “the effect of emotion on the vividness of an individual’s memory” (Kensinger & Corkin, 2003, p. 1169). It was found that participants remembered negative words more vividly and that emotionality can indeed enhance the likelihood of a more detailed memory (e. g. remembering a contextual detail, such as the color of the word). Experiments 3–6, moreover, investigated the contribution of valence and arousal to memory enhancement. The results suggest that the two factors increase the vividness of information, with arousal having the strongest impact on recall.

Furthermore, Altarriba (2014) presented an overview of different concepts of understanding the effect of emotionality on memory. One of them is a distinction between concrete, abstract and emotion words, introduced by Altarriba et al. (1999). The recall of emotion words in their study was found to be superior to abstract ones, indicating that they are characteristically distinct from other word categories. On the other hand, Knickerbocker and Altarriba (2011) distinguished between emotion words (those that indicate emotion, like *happy*) and emotion-laden words (words that mediate emotion, like *butterfly*). They concluded that emotion words may impact processing more strongly and intensively than neutral or emotion-laden words.

When speaking in terms of bilingualism, however, Altarriba (2014) mentions the challenges in translating certain emotion words from one language to another, which can alter their understanding, emotional processing and, ultimately, recall.

### **3. The study**

#### **3. 1. Aims**

The main goal of this study was to test the effect of different emotionality of words on their recall in Croatian-English bilinguals with almost equal fluency in Croatian, their L1 and English, their L2. The focus was on differences in emotional perception of words in these two languages and the way in which it affects their memorization. The study tried to provide answers to two key research questions:

- 1) Does emotion-memory effect occur in both first (Croatian) and second (English) language in bilinguals who are almost equally fluent in both languages?
- 2) Is there a difference in frequency of recall of positive words, negative words, taboo words and childhood reprimands in participants' first and second language?

#### **3. 2. Participants**

The original sample of the study consisted of 93 Croatian bilingual graduate students of the English language. Five of the participants have been eliminated as they did not meet the criteria of a Croatian-English speaker with similar fluency in both languages as they self-assessed their knowledge of English as good, opposed to other examinees who rated their knowledge as very good or excellent. Also, one more participant was not taken in account because his native languages were Serbian and German.

The rest 87 participants considered themselves to be almost equally fluent in both their respective languages: 63 (72.4 %) self-assessed their knowledge of English language as excellent and 24 (27.6 %) rated it as very good. There were 77 (88.5 %) female examinees and ten (11.5 %) male examinees, aged from 21 to 32, with the average age of 23.6. Most of them, 37 (42.5 %), were second year graduate students, followed by 19 (21.8 %) fourth year graduate students, 18 (20.7 %) first year graduate students and 13 (14.9 %) third year graduate students. Native language of all the examinees was Croatian and their second language was English. As stated in the Table 1, all of them started learning English language before or at the age of eleven, and, according to Pavlenko (2014), they could be classified as early bilinguals. One participant, however, revealed they didn't remember, and one said that she cannot pinpoint, but remembers she started learning

English from a very early age. There were six participants that can be considered simultaneous bilinguals, as they started learning the language before or at the age of three (Pavlenko, 2014). When it comes to the context in which the participants started learning English as their L2, almost half of them, 42 (48.28 %), started in school, 23 (26.44 %) were taught at home and 20 (22.99 %) in kindergarten, while only two (2.3 %) took classes in private languages schools. Even though the original target of this study were bilinguals, most participants (89 %) spoke more than one foreign language, as can be seen in the Table 2, and can thus also be classified as multilinguals.

*Table 1 The age in which participants started learning English*

<i>Age of onset</i>	<i>The number of participants (N=87)</i>	<i>Percentage</i>
1	1	1%
3	5	6%
4	6	7%
5	20	23%
6	19	22%
7	24	28%
8	3	3%
9	4	5%
10	2	2%
11	1	1%
I don't remember	1	1%
Very early	1	1%

Table 2 *Foreign languages spoken by participants*

<i>Language</i>	<i>The number of participants (N=87)</i>	<i>Percentage</i>	
Only English	16	18%	
In addition to English	Italian	18	21%
	German	37	43%
	Russian	13	15%
	Dutch	2	2%
	Spanish	19	22%
	Portuguese	4	5%
	Norwegian	2	2%
	Swedish	3	3%
	French	7	8%
	Japanese	5	6%
	Korean	3	3%
	Slovenian	3	3%
	Chinese	1	1%
	Czech	1	1%
	Polish	2	2%
	Turkish	2	2%
Albanian	1	1%	
Icelandic	1	1%	
Catalan	1	1%	

### 3. 3. Methodology

The data was collected by a web questionnaire. The questionnaire combined the original study design of Anooshian and Hertel (1994) and the incorporation of more types of word registers that appeared in Ayçiçeğy-Dinn and Caldwell-Harris (2004). What was taken from the first study was a two-part concept consisting of word rating and word recall, while word categories and most of word items were taken from the 2004 study. These were the starting points for the questionnaire design, which was further adapted to suit the needs of this research study.

The online survey consisted of three different parts. The first part elicited participants' background information: primarily their age, gender, year of study and information about the languages they speak. They were asked to state the year and the context in which they started learning English language as well as to self-asses their language in a numeric form, with number

one standing for poor knowledge and number five for excellent. In the second part of the questionnaire, participants were asked to rate the pleasantness of each presented Croatian and English word on a Likert scale from one (very unpleasant) to five (very pleasant). Most of the words that were included were ones chosen by Ayçiğegy-Dinn and Caldwell-Harris (2004) from the *Handbook of Semantic Words Norms* (Toglia & Battig 1987). However, unlike 16 negative, 16 neutral and 16 positive words, as well as nine taboo words and seven childhood reprimands that occurred in their study, this questionnaire presented a shorter list of items. The participants, thus, had to rate eight negative, eight neutral, eight positive words, four reprimands and four taboo words. The list of the words was shortened as it was thought to be too long for a quick 15-minute online survey and some positive items were replaced because their connotations were not considered to be objectively positive. Such words were *father* and *mother*, which carry a deep and complex overtone that can, in some cases, also be negative. Instead, words *safety*, *nature* and *peace* were added, chosen as personal preferences in relation to other positive words offered by Ayçiğegy-Dinn and Caldwell-Harris (2004). The words in the rating task and the languages were presented in a random order. The third part of the questionnaire, furthermore, was a surprise recall test that required participants to write down as many words as they remember from the previous rating task.

The pilot study was conducted on three graduate students of English language, and no issues with the survey design were found. Also, three positive items, *safety*, *nature* and *peace*, that replaced less suitable positive words from the 2004 study, were proven to be pleasant or very pleasant in all of the cases. After the successful pilot study, the questionnaire was distributed through social media, primarily in Facebook groups of English students of Croatian universities. Before filling out the survey, participants had to give their informed consent, which was written in Croatian, while the other two parts were written in English, apart from some word items in the rating task.



## 4. Results

### 4. 1. Word emotionality assessment

To answer the key research questions, the first variable that had to be analyzed was the word emotionality rating. This data was gathered from the second part of the questionnaire, where participants had to rate pleasantness of different categories of words presented in both Croatian and English language. As it was anticipated, the expected level of pleasantness of each word category was confirmed, and it was found that same word categories caused similar emotional reactions – negative, positive or neutral – in both languages. One participant, however, had unlikely and extreme emotional responses to all stimuli except positive and caused fluctuations in results, which is why median, instead of arithmetic mean, was taken into consideration for the word rating analysis. Thus, on a Likert scale of 1–5, there were no significant deviations among the medians ( $C$ ) in pleasantness rates of same word categories in Croatian and English language, as can be seen in Table 3. Also, the interquartile range ( $Q_{3-1}$ ) for all categories did not exceed one rating, which confirms that the selected categories of words had the expected impact on the participants. It is, however, necessary to mention that five of them left one blank rating for words from different categories, but this did not alter the findings notably.

Table 3 *Results of word emotionality assessment task for each category of words in English and Croatian*

<i>Word category</i>	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>C</i>	<i>Q<sub>3-1</sub></i>
Negative_Eng	87	1.00	4.75	1.63	0.75
Negative_Cro	86	1.00	4.88	1.56	0.88
Neutral_Eng	87	2.38	5.00	3.13	0.25
Neutral_Cro	86	1.75	5.00	3.00	0.25
Positive_Eng	87	3.00	5.00	4.75	0.75
Positive_Cro	86	3.13	5.00	4.63	0.53
Reprimands_Eng	86	1.00	4.50	2.00	0.75
Reprimands_Cro	86	1.00	4.50	1.75	1.00
Taboo_Eng	87	1.00	5.00	1.75	0.75
Taboo_Cro	87	1.00	4.50	1.75	1.00

## 4. 2. Recall

To compare ratings of words to their recall and see if emotionality of words affected their memorization in both Croatian and English language, a Bonferroni post hoc test was conducted. Here the arithmetic mean ( $M$ ) and standard deviation ( $SD$ ) were observed, as no extreme findings were present. Also, since word categories did not contain the same number of words (taboo words and reprimands had only four words each), the means are expressed in percentages, rather than in number of recalled words, to avoid confusion. The analysis presented in the Table 4 revealed that the emotion-memory effect did indeed occur in both L1, Croatian, and L2, English, and at a very similar level – meaning neutral words ( $M = 0.30$ ) were less recalled than emotional ones in both languages. What is more, the means of recall for the same words categories in L1 ( Figure 1) were comparable to those in L2 (Figure 2). This was confirmed by a dependent t-test, which proved that there were no statistically significant differences ( $p > 0.05$ ) between the recalled words in two languages for all word categories (Table 5).

As anticipated, the results showed that emotional words – positive, taboo and reprimands – had recall advantage over neutral words. Taboo words had the highest level of recall in both languages ( $M = 0.52$  in English and  $M = 0.53$  in Croatian), followed by reprimands ( $M = 0.47$  in English and  $M = 0.45$  in Croatian) and positive words ( $M = 0.42$  in English and  $M = 0.43$  in Croatian). The recall maximum for taboo and reprimand category was 100% (Table 4), which means that some participants remember all four items from these categories. What was surprising, however, was that the number of recalled negative ( $M = 0.33$  in English and  $M = 0.32$  in Croatian) and neutral words ( $M = 0.30$  for both languages) was similar. Another interesting finding is that reprimands ( $M = 0.47$  in English and  $M = 0.45$  in Croatian) and negative words ( $M = 0.33$  in English and  $M = 0.32$  in Croatian) were recalled better in English than in Croatian language. However, a dependent t-test showed that statistical differences between the average number of recalled words in English and Croatian for reprimands ( $p = .35$ ) and negative words ( $p = .27$ ) were not significant, as it can be seen in the Table 5.

When it comes to participants' approach to the recall task, it is possible to divide them into two groups accordingly: 58% of the subjects wrote down the words they remember intuitively, without thinking about the language difference, as it was expected from them, while other 42%

focused on translating the words from one language to another. The difference can be noticed in the pattern of word entry: if the pattern of recalled words and languages is random, it is assumed that the recall was instinctive, as opposed to systematic pattern consisting of a word immediately followed by its translation equivalent. The translation of words proved to be a limitation of the research study, and it will be elaborated later in the text.

Table 4 *Recalled words in English and Croatian*

<i>Word category</i>	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>
Negative_Eng	87	0.00	0.88	0.33	0.18
Negative_Cro	87	0.00	0.88	0.32	0.19
Neutral_Eng	87	0.00	0.63	0.30	0.16
Neutral_Cro	87	0.00	0.63	0.30	0.16
Positive_Eng	87	0.00	0.88	0.42	0.21
Positive_Cro	87	0.00	0.88	0.43	0.20
Reprimands_Eng	87	0.00	1.00	0.47	0.30
Reprimands_Cro	87	0.00	1.00	0.45	0.33
Taboo_Eng	87	0.00	1.00	0.52	0.28
Taboo_Cro	87	0.00	1.00	0.53	0.28

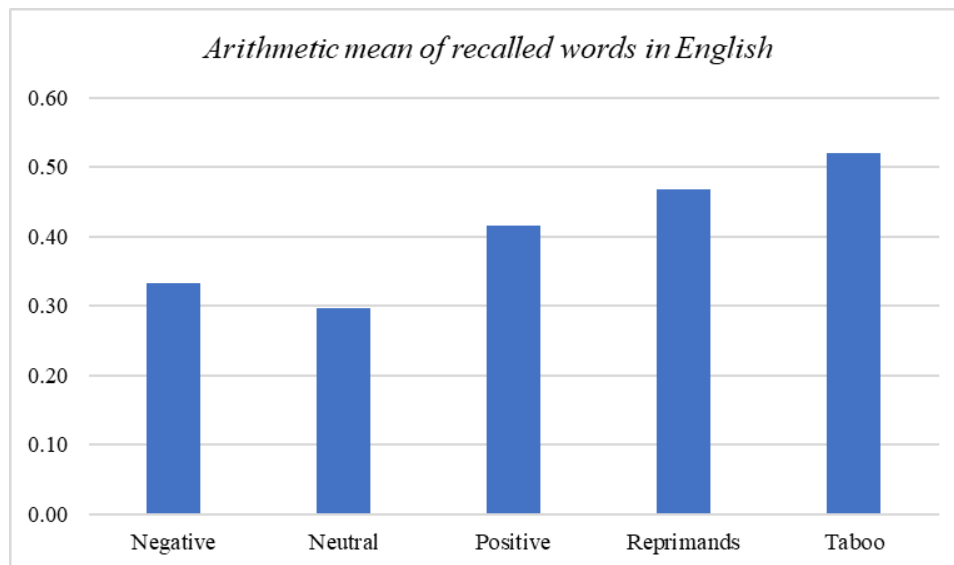


Figure 1 *Arithmetic mean of recalled words in English*

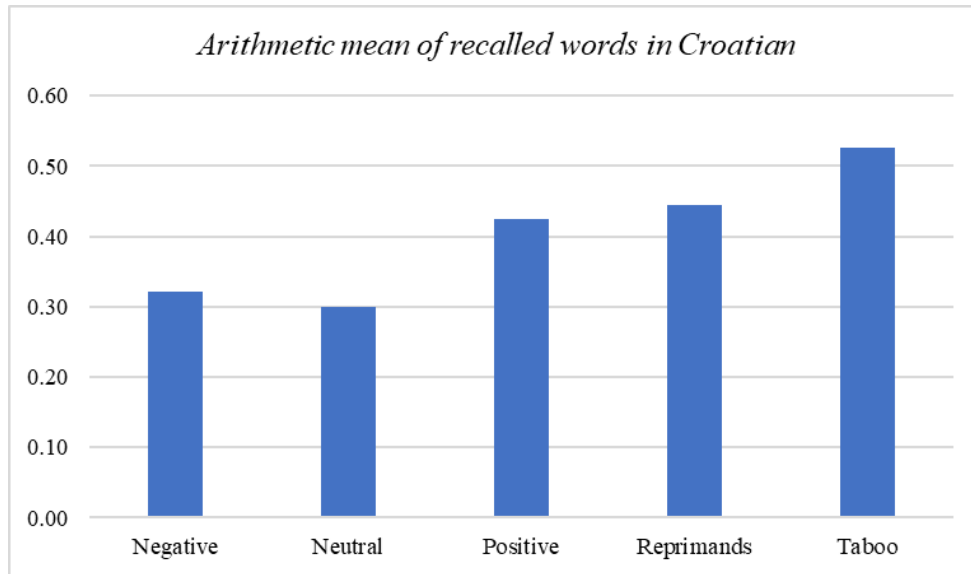


Figure 2 *Arithmetic mean of recalled words in Croatian*

Table 5 *Statistical significance of differences between recalled words in English and Croatian*

<i>Word category</i>	<i>M</i>	<i>N</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>
Negative_Eng	0.33	87	0.18	1.1	86	0.27
Negative_Cro	0.32	87	0.19			
Neutral_Eng	0.30	87	0.16	-0.4	86	0.71
Neutral_Cro	0.30	87	0.16			
Positive_Eng	0.42	87	0.21	-0.7	86	0.46
Positive_Cro	0.43	87	0.20			
Reprimands_Eng	0.47	87	0.30	0.9	86	0.35
Reprimands_Cro	0.45	87	0.33			
Taboo_Eng	0.52	87	0.28	-0.3	86	0.80
Taboo_Cro	0.53	87	0.28			

## 5. Discussion

The main goal of this research study was to test the occurrence of emotion-memory effect in Croatian-English bilinguals, having in mind factors that have influenced results in the previous studies concerning this phenomenon – factors like participants' age of L2 onset, their L2 fluency, as well as the design of the research. The findings of this study will be discussed here and examined through the two key research questions.

### **5. 1. Does emotion-memory effect occur in both first (Croatian) and second (English) language in bilinguals who are fluent in both languages?**

The results of this study show that emotion-memory effect does occur in L1 and L2 of bilinguals with similar knowledge of both languages. The stronger recall of emotional words happens at the similar level in Croatian and English language, while neutral words are the least recalled word category in both. As it was anticipated, fluency was not a moderator variable because all the participants were graduates of English languages who have self-assessed their knowledge of English language as very good or excellent and who have started learning English as their L2 relatively early, before or at the age of eleven.

### **5. 2. Is there a difference in frequency of recall of positive words, negative words, taboo words and childhood reprimands in participants' first and second language?**

Same categories of words had very similar frequency of recall in both Croatian and English language. Emotional words had a recall advantage over neutral words, which has been predicted, and the most frequently recalled group of words were taboo words, followed by reprimands and positive words. What was surprising was that there was no notable variance in recall of negative and neutral words in both languages. For example, a negative word *murder* was recalled 29 times in total, while a neutral word *window* 25 times. A finding like this also occurred in Ayçiçeğy-Dinn and Caldwell-Harris (2009), who proposed that the lack of emotion-memory effect for negative words happens because they are learned somewhat later than positive words. Children are, generally, first taught to say positive words like *family* and *love*, rather than negative ones like *death* and *war*, and can, thus, perceive them more intimately and emotionally later in life. This

could explain participants' better memorization of positive words over negative not only in this study, but also in previous ones.

On the other hand, taboo words and reprimands had the strongest recall of all categories, with the latter one being even more recalled in English than in Croatian language. These results are consistent with the ones found in both studies on emotion-memory effect by Ayçiçeğy-Dinn and Caldwell-Harris (2004, 2009). They suggest that high recall of these categories may be affected by the unusualness of the stimuli and the fact that participants didn't expect to encounter them in this context. These words "stood out as striking and unexpected" (Ayçiçeğy-Dinn & Caldwell-Harris, 2004, p. 984) when compared to other words on the list, which is why they made such an impression. This explains why some participants remembered every of the four taboo words or reprimands. In this case, it can be argued that the emotion-memory effect occurs because taboo words and reprimands created an instant emotional reaction in participants, and that their previous experiences did not necessarily form predisposition for an emotional reaction, as it was probably the case in recall of positive words. This can especially be said for reprimands, as it is assumed that they are mainly uttered in Croatian language during childhood, and they are not as controversial as taboo words. These findings, thus, prove that emotion-memory effect depends on many factors and that emotional reactions to words can either be instant or have a deeper emotional processing. When conducting research on this phenomenon in bilinguals and comparing two languages, it is certainly desirable that participants have similar levels of fluency in both languages, but their past experiences with certain languages in the past do not automatically have to condition their emotional responses to certain stimuli.

### **5. 3. Limitation of the study**

When comparing the recall in two languages, however, it is necessary to mention the limitation which altered the findings of this study. The instructions in the recall task proved to be ambiguous for participants (42%), who interpreted it differently than others. Instead of automatic recall and writing down the words that first came to their mind, they would first write words in one language and then provide their translation equivalents. This can especially be noticed in instances where the second word is written in brackets or separated by dash, for example *peace (mir)* or *prozor – window*, or in case where the first word is not correctly translated, like *raped –*

*silovanje* (instead of *silovana*). What is interesting is that one part of the participants first wrote down words in Croatian and then translated them to English, while others did the opposite. Among them, there were some who were not entirely consistent in their translations and who would, along with translated words, write additional words only from the language they memorized better – which implies that the instinctive recall interfered with systematic method of translation. The occurrence of translation, which has also been detected in the study by Ayçiçeğy-Dinn and Caldwell-Harris (2009), contributed to the similar level of recall in both languages in this research study, but it is not possible to tell whether participants' intentions were merely to translate the words, or if some other thought processes were in question. A way to avoid this in future research is to give clear, detailed and unambiguous task instructions.

## 6. Conclusion

In conclusion, this research study confirms that emotion-memory effect occurs in both first and second language of Croatian-English bilinguals with similar fluency in both languages. The level of recall of same word categories is very similar in their L1 and L2, and the most recalled words are taboo words, followed by reprimands and positive words. Neutral words had the lowest recall score, but they did not differ immensely from negative words. These findings correspond with the previous ones carried out by Ayçiçeğy-Dinn and Caldwell-Harris (2004, 2009), who explained that the low recall of negative words may be due to the fact that they are generally learned later in life. Meanwhile, the results also show that reprimands, expressed mainly in one's native language, are more recalled in participants' L2 than in their L1. This can arguably be the consequence of the unexpectedness of the stimuli, leading to an instant emotional reaction, rather than the one conditioned by individuals' previous experiences. It can, thus, be said that there are two types of emotional reactions to language stimuli – one determined by familiarity, and the other, formed instantaneously and detached from notions like the age of L2 onset and the context in which the L2 was acquired. Fluency in a second language does not guarantee the absence of novelty effect, which can be just as powerful as in-depth emotional attachment to words – and this is a phenomenon worth investigating in the future.



## 7. References

- Altarriba, J. (2014) Emotion, Memory, and Bilingualism. In R. R. Hereida & J. Altarriba (Eds.) *Foundations of Bilingual Memory*. Springer-Verlag, pp. 185–203. [http://dx.doi.org/10.1007/978-1-4614-9218-4\\_9](http://dx.doi.org/10.1007/978-1-4614-9218-4_9)
- Anooshian, L. J. & Hertel, P. T. (1994) Emotionality in free recall: Language specificity in bilingual memory. *Cognition and Emotion*, vol. 8, no. 3, pp. 503–514. <https://psycnet.apa.org/doi/10.1080/02699939408408956>
- Aronin, L. & Singleton. D. (2012). *Multilingualism*. John Benjamins Publishing Company. <https://doi.org/10.1075/impact.30>
- Ayçiçeğy-Dinn, A. & Caldwell-Harris, C. (2004) BRIEF REPORT Bilinguals' recall and recognition of emotion words. *Cognition & Emotion*, vol. 18, no. 7, pp. 977–987. <http://dx.doi.org/10.1080/02699930341000301>
- Ayçiçeğy-Dinn, A. & Caldwell-Harris, C. (2009) Emotion-memory effects in bilingual speakers: A levels-of-processing approach. *Bilingualism: Language and Cognition*, vol. 12, pp. 291–303. <https://doi.org/10.1017/S1366728909990125>
- Bloomfield, L. (1933) *Language*. Holt, Rinehart & Winston.
- Braun, M. (1937) Beobachtungen zur Frage der Mehrsprachigkeit. *Göttingische Gelehrte Anzeigen*, vol. 4, pp. 115–130.
- Butler, Y. G. (2012) Bilingualism/Multilingualism and Second-Language Acquisition. In: Bhatia, T.K. Bhatia & Ritchie, W.C. (Eds.) (2012) *The Handbook of Bilingualism and Multilingualism*. Blackwell Publishing, Ltd, pp. 109–136. <https://doi.org/10.1002/9781118332382.ch5>
- Dewaele, J.-M. (2013) Multilingualism and Emotions. In: Chapelle, C. A. (Ed.) (2013) *The Encyclopedia of Applied Linguistics*. Oxford, pp. 1–7. <http://dx.doi.org/10.1002/9781405198431.wbeal0795>
- Edwards, J. (1994) *Multilingualism*. Routledge.

Hall, A.R. (1952) Bilingualism and applied linguistics. *Zeitschrift für Phonetik und allgemeine Sprachwissenschaft*, vol. 6, pp. 13–30.

Kensinger, E. & Corkin, S. (2003) Memory enhancement for emotional words: Are emotional words more vividly remembered than neutral words? *Memory & cognition*, vol. 31, no. 8, pp. 1169–1180. <https://doi.org/10.3758/BF03195800>

Pavlenko, A. (2002) Bilingualism and Emotions. *Multilingua – journal of Cross-cultural and Interlanguage Communication*, vol 21, pp. 45–78. <http://dx.doi.org/10.1515/mult.2002.004>

Pavlenko, A. (2014) *The bilingual mind: And what it tells us about language and thought*. Cambridge University Press

Wei, L. (2000). Dimensions of bilingualism. In: Wei L. (Ed.) (2000) *The Bilingualism Reader*. Routledge, pp. 3–25.

Wickham, L. A. (2019) *Perceptions of Emotions by Simultaneous Bilinguals Across Various Relationship Contexts*. University Honors Theses. <https://doi.org/10.15760/honors.678>

## 8. Appendixes

### 8. 1. List of Croatian and English word stimuli

<i>Word category</i>	<i>Croatian language</i>	<i>English language</i>
<i>Negative words</i>	zločin	crime
	okrutan	cruel
	smrt	death
	grob	grave
	ubojstvo	murder
	bol	pain
	ropstvo	slavery
	rat	war
<i>Positive words</i>	sloboda	freedom
	prijatelj	friend
	dom	home
	radost	joy
	ljubav	love
	sigurnost	safety
	priroda	nature
	mir	peace
<i>Neutral words</i>	kutija	box
	grana	branch
	stolica	chair
	vrata	door
	ime	name
	broj	number
	ulica	street
	prozor	window
<i>Reprimands</i>	Idi u svoju sobu!	Go to your room!
	Srami se!	Shame on you!
	Ušuti!	Shut up!
	Mrzim te!	I hate you!
<i>Taboo words</i>	šupak	asshole
	sranje	shit
	kurva	whore
	silovana	raped

## 8. 2. Questionnaire

Istraživanje u svrhu diplomskog rada na studiju anglistike: povezanost između emocija i jezika

### PART I

Poštovani,

pred Vama se nalazi anketni upitnik koji se provodi u svrhu izrade diplomskog rada na Odsjeku za anglistiku pri Filozofskom fakultetu u Zagrebu. Cilj istraživanja je ispitati povezanost između emocija i jezika kod studenata diplomskog studija anglistike. Upitnik će sadržavati riječi i fraze na hrvatskom i engleskom jeziku, a sastojat će se od dva dijela: u prvom dijelu bit ćete zamoljeni dati vlastitu procjenu emocionalnosti svake riječi, dok će se u drugom testirati emocionalnost riječi u hrvatskom i engleskom jeziku.

Upitnik je anonimn i rezultati ostaju strogo povjerljivi, a koristit će se isključivo za izradu diplomskog rada. Pitanja su na engleskom jeziku, a za ispunjavanje upitnika bit će Vam potrebno 15 minuta. Sudjelovanje u istraživanju je dobrovoljno i u svakom trenutku možete odustati od ispunjavanja. Ako imate bilo kakvih pitanja ili Vas zanimaju rezultati istraživanja, slobodno mi se obratite na e-mail adresu [lucija.ecim@gmail.com](mailto:lucija.ecim@gmail.com).

Daljnijm ispunjavanjem upitnika dajete svoj pristanak za sudjelovanje u istraživanju.

Zahvaljujem se na suradnji!

Age: \_\_\_\_\_

Gender: M / F / Other

Year of study: 1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> / 4<sup>th</sup>

What is your native language? / What are your native languages? \_\_\_\_\_

What foreign language(s) do you speak? In case of more languages, start with the one you're most fluent in and end with the one you're least fluent in. \_\_\_\_\_

At what age did you start learning English language? \_\_\_\_\_

In which context did you start learning English language? In school / At home / In kindergarten / Other

Self-assess your own knowledge of English language: 1 / 2 / 3 / 4 / 5

## PART II

Rate the pleasantness of following words on a scale from 1 to 5 (1 - very unpleasant, 2 - unpleasant, 3 - neutral, 4 - pleasant, 5 - very pleasant).

crime

1                    2                    3                    4                    5

dom

1                    2                    3                    4                    5

murder

1                    2                    3                    4                    5

grob

1                    2                    3                    4                    5

chair

1                    2                    3                    4                    5

okrutan

1                    2                    3                    4                    5

name

1                    2                    3                    4                    5

ubojsstvo

1                    2                    3                    4                    5

sigurnost

1                    2                    3                    4                    5

pain

1 2 3 4 5

whore

1 2 3 4 5

smrt

1 2 3 4 5

street

1 2 3 4 5

prijatelj

1 2 3 4 5

slavery

1 2 3 4 5

stolica

1 2 3 4 5

war

1 2 3 4 5

box

1 2 3 4 5

rat (hrv.)

1 2 3 4 5

branch

1 2 3 4 5

death

1 2 3 4 5  
sloboda

1 2 3 4 5  
zločin

1 2 3 4 5  
bol

1 2 3 4 5  
nature

1 2 3 4 5  
kutija

1 2 3 4 5  
shut up!

1 2 3 4 5  
cruel

1 2 3 4 5  
grana

1 2 3 4 5  
door

1 2 3 4 5  
joy

1 2 3 4 5  
grave

1 2 3 4 5

prozor

1 2 3 4 5

ropstvo

1 2 3 4 5

broj

1 2 3 4 5

vrata

1 2 3 4 5

home

1 2 3 4 5

ulica

1 2 3 4 5

go to your room!

1 2 3 4 5

window

1 2 3 4 5

freedom

1 2 3 4 5

number

1 2 3 4 5

sranje

1 2 3 4 5

mir



1 2 3 4 5

friend

1 2 3 4 5

ime

1 2 3 4 5

I hate you!

1 2 3 4 5

radost

1 2 3 4 5

silovana

1 2 3 4 5

srami se!

1 2 3 4 5

love

1 2 3 4 5

asshole

1 2 3 4 5

shame on you!

1 2 3 4 5

safety

1 2 3 4 5

šuti!

1 2 3 4 5

shit

1 2 3 4 5

ljubav

1 2 3 4 5

šupak

1 2 3 4 5

idi u svoju sobu!

1 2 3 4 5

priroda

1 2 3 4 5

mrzim te!

1 2 3 4 5

kurva

1 2 3 4 5

peace

1 2 3 4 5

raped

1 2 3 4 5

### PART III

Try to accurately remember as many words as possible (in both Croatian and English language) from the previous task and write them down in the provided space. Please do not return to the previous page of the questionnaire.

## Sažetak

Svrha ovog diplomskog rada jest istraživanje utjecaja emocionalnosti riječi na njihovo prisjećanje u materinskom i stranom jeziku dvojezične osobe s jako dobrim poznavanjem stranog jezika. Istraživanje je provedeno na hrvatskim diplomantima anglistike koji su putem *online* formulara trebali ocijeniti emocionalnost riječi te ih se kasnije i prisjetiti. Nakon kvantitativne analize rezultata ustvrđeno je da se efekt utjecaja emocionalnosti riječi na njihovo prisjećanje pojavljuje i u hrvatskom i engleskom jeziku, i to na sličnoj razini. Najčešće zapamćene bile su tabu riječi, a određene nedosljednosti u rezultatima objašnjavaju se u okviru različitih varijabli koje utječu na vrste emocionalne obrade i reakcije na riječi.

Ključne riječi: dvojezične osobe, povezanost emocionalnosti i pamćenja, prisjećanje riječi