AMERICAN UNIVERSITY OF BEIRUT

THE RECALL OF CULTURE – SPECIFIC EMOTIONALLY CHARGED WORDS BY ARABIC/ENGLISH BILINGUAL STUDENTS

by

LAYAL GHANIM HMAIDI

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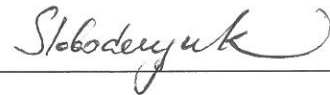of the Faculty of Arts and Sciences
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AN ABSTRACT OF THE THESIS OF

<u>Layal Ghanim Hmaidi</u>   for   <u>Master of Arts</u>
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Title: <u>The Recall of Culture – Specific Emotionally Charged Words by Arabic/English Bilingual Students</u>

Research has shown that the distinct qualities of emotionally charged words make them more memorable than neutral words. This is known as the emotionality effect. Possible explanations for the emotionality effect include both cognitive and neurophysiological accounts. This effect is robust and has been demonstrated on monolinguals and bilinguals who speak Spanish/English, Turkish/English, Chinese/English, and Spanish/Catalan.

The present study explored the emotionality effect on a sample of Arabic/English bilingual students. Additionally, it examined whether such an effect shown by universal emotionally charged words can occur for culture – specific emotionally charged words. Culture – specific emotionally charged words were defined as universally neutral words that nevertheless can evoke emotional reactions in certain cultures, similar to that elicited by universal emotionally charged words, due to their relevance to values, norms, and socio – political context of a specific society. In case of Lebanon, these words pertained to politics and religion.

The present study conducted a 2 (Language of presentation: Arabic, English) x 3 (Word category: culture – specific emotionally charged words, emotionally charged words, neutral words) within – participant experimental design on word recall. 37 male students and 39 female students from the American University of Beirut were administered an online test. The test instructed them to rate the arousal level of 48 stimuli using a 5 – point Likert scale, to complete an L2 Language History Questionnaire, and to perform an unexpected free recall test.

The results confirmed the emotionality effect, since emotionally charged words were recalled at a greater rate than neutral words, whether the language of presentation was Arabic (L1) or English (L2). Yet a larger emotionality effect occurred for L2 in comparison to L1, indicating that words in the second language of the participants were perceived as more emotional than words in the first language. Moreover, Culture – specific emotionally charged words were also recalled at a greater rate than neutral words, whether they were displayed in Arabic (L1) or English (L2). Yet, a non – significant correlation was found between the arousal ratings of culture – specific emotionally charged words and their memorability. Finally, the present study failed to find a significant relationship between the magnitude of the emotionality effect and the level of L2 proficiency, which suggests that linguistic proficiency does not mediate the emotion – memory effects of a language.

Keywords: Emotionality Effect, Emotion – Memory Effects, Arabic/English Bilinguals, Bilingualism, Language Differences, Culture – Specific Emotionally Charged Words

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The Recall of Culture – Specific Emotionally Charged Words by Arabic/English Bilingual Students

1. The Nature of Emotionally Charged Words

1.1. Universal Emotionally Charged Words

Emotionally charged words have been characterized as a special class of words due to their unique properties (Altarriba & Bauer, 2004; Pavlenko, 2008). Their distinctiveness resides in their properties of valence and arousal (Altarriba & Bauer, 2004). Valence is the degree to which a word is negative (e.g., sorrow) or positive (e.g., happiness). Arousal, on the other hand, is the degree to which a word is calming (e.g., water) or physiologically stimulating (e.g., rape; Jay, Caldwell- Harris, King, 2008). Such distinguishing features enable emotionally charged words to produce high autonomic reactivity (Harris, 2004; Harris, Ayçiçegi, & Gleason, 2003; Harris, Gleason, & Aycicegi, 2006) and to capture greater attention than their counterpart stimuli (Altarriba & Baur, 2004; Mackay & Ahmetzanov, 2005; MacKay et al., 2004; Mathewson, Arnell, & Mansfield, 2008; Most, Chun, Widders, & Zald, 2005; Pratto & John, 1991).

The attentional advantage of emotionally charged words has been verified by numerous cognitive paradigms. The emotional Stroop paradigm, for example, is among the most commonly used methods of measuring the effect of emotionality on selective attention. In this task, the participants are presented with word stimuli (emotionally charged and neutral) that vary in font color. They are then asked to ignore the meaning of the word and to report only the color of the word as fast as possible (Macleod, 1991). When Mckena and Sharma (1995) presented their participants with an emotional Stroop task, they found that the participants identified the color of emotionally charged words at a slower rate than neutral words. The

authors explained that this effect was due to the attention – capturing mechanism of emotional stimuli. In other words, the attentional bias towards emotionally charged words occurred because the participants automatically processed the meaning of the stimuli even though this was not required in the task. In this study, an interference effect was more visible for negative stimuli, since they yielded the longest response latencies in comparison to the positive and neutral stimuli. Thus, in line with Oaetly and Johnson – Laird's (1987) conflict theory of emotion, the interference occurred solely for threatening stimuli, because the human biological systems are equipped with mechanisms that detect and deal with threat in order to ensure survival. These mechanisms operate as intrusive cognitions, which prompt individuals to rapidly respond to threat in the environment and to prioritize it over less demanding goals.

Researchers who employed other paradigms of selective attention such as the Rapid Serial Visual Presentation (RSVP) have also confirmed the attentional advantage of emotionally charged words. In this task, word stimuli are presented rapidly and sequentially. Participants are then asked to report the color word (target 1 [T1]) and to ignore the remaining words – distractors (Raymond, Shapiro, & Arnell, 1992). Arnell, Killman, and Fijavz (2007), for example, presented their participants with an RSVP stream that consisted of T1 and critical distractor words: neutral, positive, negative and arousing (sexual, threat and curse words). After completing this task, the participants were asked to rate the arousal and valence of the distractor words that were present in the RSVP stream. The results of the stream task indicated that the target identification accuracy was significantly reduced when an arousing distractor (rather than other distractor types) preceded T1. According to Arnell et al. (2007), this impairment occurred because the arousing distractors captured the attention of the participants and in turn, reduced the attentional resources available for processing the subsequent target

words. Further results from the word – rating task indicated that, while the arousal ratings of the distractor words predicted the target identification accuracy in the RSVP task, the valence ratings did not. In other words, distractor words that received the highest ratings of arousal produced the highest target accuracy impairment. This outcome suggests that arousing stimuli automatically attract a greater amount of attention, in comparison to stimuli with high/low valence (Arnell, KIillman, & Fijavz, 2007). According to Scherer's (2001) sequential evaluation check (SEC) model, the attentional advantage of arousing words occurs because arousal influences the "initial relevance check" which is responsible for allocating attention onto stimuli that are perceived as relevant. Relevant stimuli, in turn, receive further processing. Since this check is performed before the "valence dimension check", arousing stimuli (e.g., sexual and taboo words) tend to capture greater attention than their counterparts (Scherer, 2001).

The attentional effect of emotionally charged words has been further validated by the Dot probe paradigm. In this task, two stimuli (emotionally charged word and neutral word) are simultaneously presented at the top and bottom of a fixation cross. After 500 milliseconds (ms) of the stimuli presentation, a dot probe is displayed in the location of one of the words. Participants are then required to respond to it as fast as possible (MacLeod, Mathews, & Tata, 1986). Sutton and Altarriba (2011) presented their participants with a dot probe task that consisted of positive – neutral word pairs, and negative – neutral word pairs. The results revealed that the participants identified the probe at a faster rate when it appeared in the location of an emotionally charged word in comparison to a neutral word. The participants also responded to the probe at a faster rate when a negative stimulus was in display rather than a positive stimulus. Therefore, attention was drawn towards the threatening content in an

automatic and prioritized manner (Sutton & Altarriba, 2011). These findings were interpreted

from the perspective of the automatic vigilance model of emotions, which suggests that

humans are evolutionarily designed to rapidly detect and process threatening information in

their environment for adaptive purposes (Pratto & John, 1991).

1.2. Individual Differences and Emotionally Charged Words

Due to their distinctive features, emotionally charged words tend to attract a greater

share of attention in comparison to neutral words. Yet, researchers have found that even neutral

words could produce similar attentional effects if they are relevant to the concerns of the

individual. For example, individuals with specific psychological disorders tend to fixate on

stimuli in the environment that are relevant to their condition (Williams, Mathews, & Macleod,

1996). Therefore, even in experimental settings, such individuals pay greater attention to word

stimuli that are congruent with their psychopathology.

The relationship between psychopathology and selective attention for words of

personal significance was examined by Watts, Mckenna, Sharrock, and Trezise (1986). In their

study, participants with spider phobia and control participants were presented with an

emotional Stroop test that consisted of emotionally charged words (e.g., death) and words

semantically related to the concept "spider" (e.g., crawl). In comparison to the control

participants, phobic participants showed little interference when naming the color of

emotionally charged words (Watts, Mckenna, Sharrock & Trezise, 1986). Yet when the stimuli

were spider – related words, they experienced high interference. Hence, their performance was

disrupted because their attention was automatically geared towards stimuli that were relevant

to their diagnosis. Lavy, Van den Hout, and Arntz (1993), replicated this finding by similarly

administering an emotional Stroop task to spider phobic participants and control participants.

The Stroop test consisted of general negative words, neutral words, and words semantically related to the concept "spider". The results indicated that, the spider – related words produced a larger interference in the performance of the phobic group in comparison to the control group. Moreover, the phobic group displayed slower response latencies for spider – related words in comparison to negative and neutral words, whereas, the control group displayed no response latency differences across the word categories. The phobic participants, thus, displayed an attentional constriction towards threatening stimuli that only pertained to their phobia. According to Merckelbach, De Jong, Muris, Van Den Hout, 1996), this is consistent with Ohman's (1993) hypothesis that an automatic attentional bias occurs because there is a fast subcortical route responsible for transmitting phobic information.

Other clinical populations that have also been examined using the RSVP task are those with posttraumatic stress disorder (PTSD). Amir, Taylor, Bomyea, and Badour (2009), for example, recruited participants with PTSD symptoms (PTS), traumatized control participants (TC) without PTSD symptoms, and non – anxious controls (NAC). They presented the participants with an RSVP task that consisted of neutral distractor words, T1 words that were either trauma – related threat words or neutral words, and color words (target 2 [T2]). The authors found that the PTS participants identified the T2 word at a higher rate when T1 was a trauma – related word rather than a neutral one. The TC participants and the NAC participants, on the other hand, showed no identification differences among the threat and neutral words (Amir, Taylor, Bomyea & Badour, 2009). The attentional biases of individuals with PTSD have been also explored through the emotional Stroop task. Foa, Feske, Murdock, Kozak, and McCarthy (1991) examined PTSD participants who had been raped, participants who had been raped but were not diagnosed with PTSD, and control participants. Their Stroop task was

tailored towards rape – related words, general threat words, neutral words and non – words. The authors found a significant disruption in the performance of the PTSD participants when the presented stimuli were rape – related words, in comparison to the other word categories (Foa, Feske, Murdock, Kozak, & McCarthy, 1991). Hence, only stimuli with the meanings relevant to the pathology of the participants captured their attention.

This pattern has been consistently found in other pathologies such as clinical anxiety. Mathews and MacLeod (1985), for example, administered an emotional Stroop task to patients with social or physical anxiety, and to control participants. The task consisted of physical threat words (e.g., cancer), social threat words (e.g., failure) and positive words (e.g., holiday). The results indicated that the anxiety patients named the color of threat (physical and social) words at a slower rate than the remaining word categories. Patients with physical anxiety, in particular, showed the greatest interference when naming the color of physical threat words (Mathews & MacLeod, 1985). Control participants, on the other hand, showed no interference differences among the word types. This finding has been reconfirmed by other attentional paradigms such as the dot probe paradigm. MacLeod, Mathews, and Tata (1986) asked participants with generalized anxiety disorder (GAD), and control participants (non – anxious) to complete a dot probe task that consisted of physical threat words (e.g., injury) and social threat words (e.g., ashamed). Each threat word was paired with a neutral word. The results revealed that, in comparison to the control participants, GAD participants detected the dot probe significantly faster when it replaced threatening (both physical and social) words as opposed to neutral words. Thus, only participants with heightened vulnerability to anxiety shifted their attention towards threatening stimuli (MacLeod, Mathews, & Tata, 1986). This attention, however, was equally directed towards physical – threat words and social – threat

words. Thus, unlike Mathews and Macleod's (1985) findings, the GAD participants attended to both types of threat words, regardless of their specific psychological concerns. The authors explained this inconsistency, by suggesting that the nature of the paradigms (dot – probe versus Stroop) may have affected the amount of processing the words received. The emotional Stroop task takes longer time and, thus, induces prolonged processing of the threat words. The dot – probe task, on the other hand, involves fewer processing stages and, hence, limits the subsequent processing of threat words (Mackleod et al., 1986).

The attentional selectivity towards threatening information has been also observed among participants with emotional disorders such as depression. Gotlib and McCann (1984) administered an emotional Stroop task to mildly depressed participants (who scored higher than 9 on the Beck Depression Inventory) and non – depressed participants. The Stroop task entailed depression – related stimuli, mania – related stimuli, and neutral stimuli. The authors found that, the mildly depressed participants named the color of depression – related words at a significantly slower rate than neutral and mania – related words. Non – depressed participants, on the other hand, showed no response differences among the word categories. Gotlib and McCann (1984) explicated these results in terms of Beck's cognitive model of depression, which asserts that depressed individuals tend to have negative schemata that influence the encoding, storage, and retrieval of information from their environment. More specifically, negative schemata tend to selectively filter out positive information and amplify negative information (Gotlib & McCann, 1984). Thus, the degraded performance in Gotlib and McCann's study occurred because the negative schema of the mildly depressed participants led to an attentional bias towards threatening stimuli.

1.3. Defining Culture – Specific Emotionally Charged Words

The previous chapters introduced the notions of universal emotionally charged words and neutral words of personal significance that elicit similar attentional biases due to their arousing quality. The present chapter introduces the notion of culture – specific emotionally charged words and makes an argument that neutral words of cultural significance (e.g., words pertaining to cultural values and norms) could evoke similar attentional biases as universal emotionally charged words.

Culture is defined as a "meaning and information system that is shared within a community and transmitted across generations" (Matsumoto, 2007, p. 1293). Human cultures exist in order to promote survival and preserve social order. Order within a complex ecology could only be maintained by norms. Norms are unspoken rules that guide the thoughts, values, feelings and behaviors of individuals within a group (Matsumoto, Yoo, & Fontaine, 2008). Different communities tend to develop unique norms that are specific to their physical environment and situational context. Therefore, cultures tend to differ in their values and social norms.

This idea has been confirmed by a comprehensive study that examined the value systems of 81 societies (Inglehart, 2001). The value surveys used, indicated that Indonesian, Egyptian, and Nigerian societies were among the highest to value religion, whereas, countries such as China and Germany were among the lowest. Vietnamese, Moroccan, and Zimbabwean societies strongly encouraged their children to respect parental authority, whereas, countries such as the Netherlands, Sweden, and Germany did not think this value was as important. On the other hand, Japanese and Danish societies strongly valued child independence, whereas, countries such as Brazil and Jordan did not. Finally, Romanian, Bulgarian, and Chinese

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societies were among the highest to value economic and physical security over quality of life, whereas, countries such as Sweden, U.S.A, and Italy were among the lowest.

In every society, cultural values tend to dictate social norms that should be followed and, thus, influence attitudes and behaviors (Boer & Fischer, 2013). For example, in Egypt, religion is highly valued and, thus, a common (in the rural villages) ritual known as Female Genital Mutilation (FGM) is performed on newborn babies, in order to reduce the sexual pleasure of women and to demotivate them from engaging in pre-marital sexual behavior, since it is against Islamic rules (Hoffmann, 2013). In Zimbabwe, emphasis is placed on respecting parental authority, and, thus, when the fathers marry off their young girls to old wealthy men (in exchange for money) or to their debtors (in exchange for exempting the debt), the girls must succumb to their parents' decision, because they live in a society of patriarchy (Kambarami, 2006). In China, economic security is highly prioritized and, thus, when the "one child policy" was enforced, it became acceptable for the parents to abort, abandon, unregister, or kill their female babies (a customary practice known as female infanticide), as sons were more likely to contribute to the family's economic security (Lai –wan, Eric, & Hoi-yan, 2006).

In addition to differences pertaining to values and norms, some cultural differences are also determined by the geo – political context. Baring in mind that cultures tend to diverge in values, social norms, and geo – political contexts, the present study presumes that concepts associated with these differences could elicit different emotional reactions in different cultures. For example, in countries like Lebanon that values sectarian order, the concept "sect" might elicit an emotional response, while, in other societies it might be perceived as a neutral concept. Accordingly, we propose that there are culture – specific emotionally charged words

that evoke emotional responses, and can be identified on the basis of long - term cultural values and norms as well as socio-political contexts.

In the context of Lebanon, such culture – specific emotionally charged words are likely to pertain to political matters as the country continues to witness extreme sectarian divisions and ongoing political discord. The sectarian nature of Lebanon resides in its demography. It is inhabited by approximately four million people, and has fostered as many as 18 recognized religions. It consists of 60% Muslims (Sunnis and Shiites), 39% Christians, and 1% others (Diab, 2010). Due to such religious diversity, this country established the unique political system of confessionalism. Confessionalism is a rule – sharing system that allocates political and bureaucratic power to all the religious groups within a country (Diab, 2010). In Lebanon, however, the distribution of power is not appropriate to the size of every religious community. Thus, conflicts over political power have constantly provoked civil wars (1860, 1958, and 1975 – 1990) that were both intersecterian and intrasectarian (Saab, 2007). The aftermath of these destructive wars left Lebanon with further sectarian divisions. The March 14th movement or the anti - Syrian camp encompasses an alliance of Sunnis (Future movement), Druze and part of the Christians (Kataeb and Ouwet movement). The opposition camp or the March 8th movement, on the other hand, represents an alliance of Shiites (Hizballah and Amal movement) and a large part of the Christians (Tayar Al-Ouni movement; Saab, 2007). The political situation of Lebanon has been further complicated by the colossal presence of Palestinian and Syrian refugees.

Due to the constant political clashes between the mentioned alliances, Lebanon has become a platform for sectarian polarizations. Indeed, a national survey found that the major religious groups of Lebanon, displayed high levels of sectarianism and perceived intergroup

threat among each other ("The Lebanese Follow their Leaders", 2007). Similar intersecterian attitudes and perceived threats were found even among the young and educated population (Saab, 2007).

The fact that political matters are central to the Lebanese society is apparent in everyday discussions and media. The national television of Lebanon, for example, tends to incorporate a significantly larger proportion of political substance in comparison to other international channels. More specifically, the OTV local channel, broadcasts (weekly) four talk shows and two comedy shows that solely revolve around politics ("News and Politics", 2013). In contrast, the Roya channel, which is a local Jordanian channel of similar status to the OTV channel, broadcasts only two political talk shows, and one political comedy show per week ("Roya News", 2013). Hence, the Lebanese channel dedicates approximately twice as much of its airing time to political matters, in comparison to the Jordanian channel. Another Lebanese channel that is predominantly oriented towards politics, is the Al Manar local channel. It broadcasts eight political talk shows, thirteen productions (both episodes and talk shows) under the category of "political resistance", and twenty religious programs ("Politics and Religion", 2013). Such a politically determined channel, on the other hand, does not exist in the Jordanian television, simply because political issues are not as important to the Jordanian audience.

Since politics is a noteworthy topic that interests the Lebanese community, we propose that universally neutral words pertaining to politics and religion, may elicit an emotional response in the Lebanese population, similar to that elicited by universal emotionally charged words. Since research has shown that emotionally charged words produce attentional biases due to their arousing nature (Mckena & Sharma, 1995; Sutton & Altarriba, 2011), we assume

that culture – specific emotionally charged words will also produce attentional biases for Lebanese individuals and result in a memory advantage.

2. Monolingual Memory for Emotionally Charged Words

Researchers have consistently found that emotionally charged words have an attentional advantage over neutral words (Arnell et al., 2007; Most et al., 2005; Pratto & John, 1991; William et al., 1996). They have also discovered that an attentional advantage leads to memory enhancement (Ferre; 2003; Kesinger & Corkin, 2003; Mckay et al., 2004). That is, words that capture greater attention tend to be more memorable. The following chapter will confer the rationalizations behind the emotionality effect (the memory advantage of emotionally charged words) and review the related empirical evidence.

2.1. The Cognitive Explanation

Several cognitive accounts such as the automatic vigilance theory (Pratto & John, 1991), the priority binding theory (Mckay et al., 2004), the sequential check theory (Scherer, 2001), and the level of processing (LOP) theory (Craik & Lockhart, 1972) have been offered to explain the emotionality effect. These explanations address the evolutionary value, the context – specific binding mechanisms, the sequence of stimulus appraisals, and the different processing levels of emotionally charged stimuli, respectively. Only the LOP theory will be discussed in this chapter because of its direct relevance to the current study. Craik and Lockhart (1972) were the first to propose that the memorability of verbal stimuli depends on their level of processing. According to their model, if the physical/superficial aspects of a word are encoded, then a shallow level of processing will occur. On the other hand, if the semantic aspect of a word is encoded, then a deeper level of processing will take place. Deeper processing of the stimuli, in turn, leads to memory enhancement (Craik & Lockhart, 1972).

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This is known as the level of processing effect. In order to examine whether the level of processing influences the memory for emotionally charged words versus neutral words, Ferre (2003) distributed the participants across two different encoding conditions. In the semantic condition, the participants were instructed to rate the emotional pleasantness of each word (in order to elicit deep processing of the meaning of the stimuli), while, in the physical condition they were instructed to count the number of vowels in each word (in order to elicit shallow processing of the physical features of the stimuli). The stimuli entailed positive, negative, and neutral words. Upon completion of the encoding tasks, the participants received an unexpected free – recall test. The overall results revealed that the participants in the semantic condition recalled a greater proportion of words in comparison to the participants in the physical condition. This signifies that a level of processing effect had taken place. Both groups, however, recalled the positive and negative words at a higher rate than the neutral words. Even when the participants allocated their attention towards the physical aspects of the stimuli and disregarded the affective valence, emotionally charged words were still recalled the most. Hence, a retention advantage for emotionally charged words occurred as a result of their affective valence (emotionality effect) rather than their encoding (level of processing effect). Yet, since the participants in the semantic condition displayed a larger emotionality effect, Ferre (2003) concluded that, even though emotionally charged words can be retained without deliberate attention, the magnitude of their memorability would be even greater, if they are processed at a deeper level.

2.2. The Neuro – Physiological Explanation

Studies on explicit memory tasks (e.g., recall test, recognition test) have consistently shown that arousing words (e.g., taboo and sexual terms) are significantly more memorable

than non – arousing words of positive or negative valence, and neutral words. In addition to the cognitive explanations of the emotionality effect, a neuro – physiological explanation has been also proposed. According to the memory modulation theory, the relationship between arousal and memory enhancement is mediated by the amygdala. The amygdala is a structure in the medial temporal lobe that plays a critical role in the emotional processing system of humans and animals (Sharot & Phelps, 2004). When subjects experience emotional arousal, adrenal stress hormones (e.g., epinephrine) are released in the blood. The presence of stress hormones activates the amygdala. This activation, in turn, prompts the consolidation processes of the hippocampus (via the adrenergic receptors), and strengthens memory (Hamman, 2001; LaBar & Phelps, 1998; McGaugh, 2000). Therefore, the amygdala enhances memory by modulating the hippocampal/ medial – temporal lobe memory system. In order to investigate the role of the amygdala – hippocampal consolidation processes in the retention of emotionally arousing words versus non – arousing words, LaBar and Phelps (1998) asked normal participants and temporal lobectomy patients (TL patients) to rate the arousal level of taboo words and neutral words, while measuring their skin conductivity responses (SCRs). The SCR measures indicated that both participant groups showed greater physiological arousal for taboo words rather than neutral words during the encoding phase. Only the normal participants, however, showed a memory advantage for taboo words, while the TL patients did not (LaBar & Phelps, 1998). Due to the damage of their medial temporal lobe structures, the TL patients failed to consolidate the memories of the taboo words. Accordingly, the authors concluded that the amygdala and the medial temporal lobe play a fundamental role in the processing and consolidation of arousing words.

Kesinger and Corkin (2004) came to the same conclusion after they examined the brain pathways associated with the processing of emotionally charged words versus neutral words. Using functional magnetic resonance imaging, they found that arousing stimuli (taboo words) and non – arousing stimuli (negative and neutral words) were encoded using separate neural pathways. Arousing words were associated with the activation of the amygdala – hippocampal network, whereas, non – arousing words were associated with the activation of the hippocampal prefrontal network. A correlation was also found between the level of activation in the mentioned brain regions, and the subsequent memory performance (recognition task) of the participants. That is, greater activation in the left amygdala and left hippocampus was associated with greater recognition for arousing words, whereas, greater activation in the left hippocampus and the left inferior prefrontal cortex (PFC) was associated with greater recognition for non – arousing words (negative and neutral). This correlation between the amygdalar activation, the hippocampal activation, and the memory advantage for arousing words, is consistent with the modulation hypothesis, which states that the activation of the amygdala modulates the hippocampal memory system (Kesinger & Corkin, 2004). Further results indicated that, the activation of the amygdalar – hippocampal network was associated with the automatic processing of arousing words, while, the activation of the PFC – hippocampal network was associated with controlled processes such as elaboration and rehearsal. Accordingly, Kesinger and Corkin (2004) concluded that memory enhancement for non – arousing stimuli is mediated by a PFC – hippocampal network and requires elaborative processing, whereas, memory enhancement for arousing stimuli is mediated by the amygdalar – hippocampal network and is associated with automatic processing.

Since both the memory modulation theory and the level of processing theory have contributed to the explanation of the superior recall of emotionally charged words, Jay, Caldwell-Haris, and King (2008) attempted to measure both the physiological arousal and the level of processing of the participants, in order to determine the true underlying mechanism of the emotionality effect. They firstly presented the participants with arousing words (taboo terms), non – arousing words of positive or negative valence (emotionally charged terms), and neutral words. Then required them to respond to orienting questions that either prompted shallow processing (e.g., Is the word in upper case) or deep processing (e.g., Is the word a member of this specific category [body part, animal, sexual act]). Electrodes were attached to the participants' fingers in order to measure their skin conductance level. After completing the questions on all the words, participants were given a self – report questionnaire (in order to induce forgetting) and then given an unexpected recall test. The results indicated that taboo words were recalled at a greater rate than emotionally charged words and neutral words. The superior recall of taboo words signified that, arousing words (rather than valence words) produced the largest emotion – memory effects (Jay, Caldwell-Harris, & King, 2008). Further results showed that neutral words were recalled at a greater rate during the deep task in comparison to the shallow task. Taboo and emotionally charged words, on the other hand, were recalled at a higher rate during the shallow task rather than the deep task. Hence, only the neutral words exhibited the LOP effect, because their memorability increased as a result of deeper processing. The fact that taboo words benefited the least from the deep processing task implies that their memory advantage was based on the emotionality effect rather than the LOP effect. In other words, the emotional content of the taboo words was arousing enough to enhance memory, regardless of the level they were processed at (Jay et al., 2008). This was

confirmed by the participants' electrodermal measures, which indicated that taboo words elicited higher skin conductance responses than the other word categories, in both the shallow and the deep task. A strong correlation was also found between the recall percentage of stimuli and the frequency of SCRs, so that, words that produced higher levels of arousal also tended to be more memorable. This signified that the underlying mechanism behind the emotionality effect is the arousing inherent property of emotionally charged words.

3. Bilingual Memory for Emotionally Charged Words

3.1. First and Second Language Differences

Researchers have constantly investigated the emotionality effect using monolingual participants, yet, within the last decade they have begun to study bilingual speakers as well. This interest emerged after bilinguals started reporting that the first language is more emotionally intense than the second language. For example, Dewaele (2004) found that bilinguals frequently chose to express anger in their first language because they tended to perceive taboo words as more emotionally forceful in their mother tongue. Sechrest, Flores, and Arellano (1968) reported that Filipino couples chose to express intimacy in their first Tagalog language, even though their spoken language at home was English. Bond and Lai (1986) showed that bilingual speakers preferred to discuss embarrassing topics in their second language rather than their first language. Indeed, bilingual subjects have been found to experience less anxiety when pronouncing taboo words in their second language (Gonzalez – Reigosa, 1976). Such reports have lead researchers to believe that the first language (L1) of bilinguals serves as the language of emotional expression, while the second language (L2) serves as the language of emotional distance (Anooshian & Hertel, 1994; Aycicegi & Harris, 2004).

To investigate whether language plays a role in the memory advantage of emotionally charged words, Anooshian and Hertel (1994) asked Spanish – English bilinguals (who acquired their second language after eight years of age) to rate the emotional intensity, pronunciation, and implied activity (how much motion was inherent in the meaning of the words) of neutral and emotionally charged words (positive and negative). After administering an unexpected free recall test, Anooshian and Hertel (1994) found that the subjects recalled emotionally charged words at a higher rate than neutral words, when the language of presentation was L1. Words presented in their second language, however, resulted in no word recall differences. Thus, as predicted, an emotionality effect occurred only in the first language of the participants. In an attempt to replicate this finding, Ayçiçegi and Harris (2004) asked Turkish – English bilinguals (who acquired their second language after eleven years of age) to rate the pleasantness of the following categories: reprimands, taboo, negative, positive, and neutral words. Half of the subjects were later given a free recall test and the other half a recognition test that required them to circle recognized items from a word list. The results of the recall task indicated that in L1, a memory advantage occurred for the taboo words, whereas in L2, a memory advantage occurred for the taboo words and the reprimands. In fact, stronger emotion – memory effects were found in the second language. Similarly, the results of the recognition task showed that, a retention advantage occurred for the taboo words in both L1 and L2. Unlike Anooshian & Hertel's findings, this study found an emotionality effect in the first language and an even stronger effect in the second language. Ayçiçegi and Harris (2004) proposed that this might have occurred because the L2 stimuli might have been processed more deeply than their L1 equivalents. For example, the participants may have mentally translated the emotionally charged English stimuli to Turkish, in order to facilitate the process of rating their emotional

intensity. Consequently, the activity of translation may have led to a deeper processing of the L2 words and, therefore, enhanced their recall. Another proposed explanation was that the participants might have experienced a novelty effect for the English reprimands and the taboo words (due to their innovative translation) in comparison to their already familiar Turkish counterparts (Ayçiçegi & Harris, 2004). As a result of this effect, the L2 stimuli might have been processed more deeply and therefore recalled at a higher rate.

In order to follow up on whether the depth - of - processing plays a role in the emotional memory advantage of stimuli in L1 and L2, Ayçiçegi – Dinn and Caldwell – Harris (2009) presented Turkish–English bilinguals (whose native language was Turkish and whose second language was acquired after 12 years of age) with five categories of words: reprimands, neutral, positive, negative, and taboo. Then they asked the participants to perform one of four tasks that varied in processing levels: letter counting (shallow), emotional intensity rating (deep), word association (deeper), and translation (deeper). After administering an unexpected recall test, the authors found that reprimands and taboo words produced the highest recall rate across all the tasks. They also found that, on average, the memory advantage for emotionally charged words occurred equally in both the first and the second language. The exception, however, were the words from the reprimands category, because they were recalled at a higher rate in English (L2) than in Turkish (L1). The authors once again interpreted this result as a novelty effect. A further analysis that excluded the reprimands category indicated that the nature of the tasks influenced the recall differences in both languages. For example, in the emotional intensity task, an emotionality effect occurred when the language of presentation was Turkish (L1). In the translation task, the memory advantage (for taboo and positive words) was restricted to the second language (English). This was a surprising effect, because the

participants later noted that translating Turkish words (L1) into English (L2) was an effortful and difficult process (due to the extensive Turkish vocabulary). This implies that Turkish words should have been processed more deeply and therefore recalled at a higher rate than L2 words (Ayçiçegi – Dinn & Caldwell – Harris, 2009). Yet, greater emotion – memory effects occurred in the second language. Finally, in the word association and letter counting tasks, the memory effects were similar across both languages. These findings indicate that regardless of the depth of processing, the emotional attributes of word stimuli tend to be automatically processed in the same manner and across both languages (Ayçiçegi – Dinn & Caldwell – Harris, 2009). Therefore, the native language of bilinguals is not necessarily the emotional language.

3.2. Factors Mediating the Emotion – Memory Effects

Even though a large body of empirical evidence has consistently demonstrated the emotion – memory effects, there are a number of factors that influence the superior retention of emotionally charged words, such as the age of the second language acquisition and the proficiency level of L2.

Individuals who acquire their second language before the age of seven are labeled as early bilinguals, whereas those who acquire it after the age of seven are known as late bilinguals. According to Bloom & Beckwith (1987) during childhood, infants develop their linguistic abilities and emotional regulation systems in a synchronized manner. That is, they learn to associate their early emotional experiences with their first language. These associations continue to grow throughout adulthood as well. Thus, late bilinguals should associate their new affective experiences with the language they first acquired during the early years. In other words, they should experience greater emotionality in L1 in comparison to L2 (Bloom &

Beckwith, 1987; Dewaele, 2004). Early bilinguals, on the other hand, may not perceive their native language as more emotional, because they have acquired both languages at an early age. Consequently, their emotional experiences should be associated with both L1 and L2.

In fact for some early bilinguals, L2 is perceived as the emotional language rather than L1. This tends to occur when the bilinguals are more proficient in their second language (Sutton, Altarriba, Gianico, & Basnight – Brown, 2007; Dewaele & Pavlenko, 2002). Language proficiency ordinarily develops when the language is acquired within an instructed setting (e.g., school) and when it is frequently used (e.g., at home, among friends etc.). Bilingual speakers who use their second language significantly more often than their native one, should, therefore, associate L2 with their emotional experiences (Ayçiçegi & Harris, 2004; Eilola, Havelka, & Dinkar, 2007).

4. Objectives and Hypotheses

The main objective of the present study is to examine the effect of culture – specific emotionally charged words on the free recall of Arabic/English bilingual students. More specifically, this study aims to explore whether words related to the Lebanese socio-political context could produce an emotionality effect similar to that produced by universal emotionally charged words and could lead to memory enhancement. It also attempts to explore whether other variables could influence the recall advantage of universal emotionally charged and culture – specific emotionally charged words such as the language of presentation, age of second language acquisition, and the level of second language proficiency.

Emotionally charged words possess unique properties that help them capture greater attention than neutral words (Altarriba & Bauer, 2004; Arnell et al., 2007; Mckena & sharma, 1995; Sutton & Alberta, 2007; Pavlenko, 2008). Empirical studies have shown that this

attentional advantage can enhance the memory for emotionally charged words. This is known as the emotionality effect and it has been confirmed on monolinguals (Ferre, 2003; Jay et al., 2008; Kesinger & Corkin, 2003) as well as bilinguals (Anooshian & Hertel, 1994; AyçiçeğI – Dinn & Caldwell – Harris, 2009; Ayçiçegi & Harris, 2004). Therefore, we propose that:

Hypothesis 1a: Participants will recall emotionally charged words at a significantly greater rate than neutral words in the first language.

Hypothesis 1b: Participants will recall emotionally charged words at a significantly greater rate than neutral words in the second language.

Even though bilingual reports have indicated that the native language is more emotionally intense than the second language (Bond & Lai, 1986; Dewaele, 2004; Gonzalez – Reigosa, 1976; Sechrest et al., 1968), this has not been fully supported by the empirical research. Anooshian and Hertel (1994) found a larger emotionality effect in L1, whereas, Aycicegi and Harris (2004) found a larger effect in L2, and Aycicegi – Dinn and Caldwell – Harris (2009) found similar emotion – memory effects in both L1 and L2. These conflicting findings indicate that, the magnitude of the emotion – memory effects may depend on the age of second language acquisition, and the proficiency level of L2 (Anooshian & Hertel, 1994; Bloom & Beckwith, 1987; Christianson & Fallman, 1990; Dewaele, 2004; Dawaele & Pavlenko, 2002; Eilola et al., 2007; Sutton et al., 2007). That is, late bilinguals who acquired their second language after the age of 7, tend to experience a larger emotionality effect than bilinguals who acquired their second language at an earlier age (Bloom & Beckwith, 1987; Dewaele, 2004). Similarly, bilinguals who are less proficient in the second language (than the first language) tend to exhibit larger emotion – memory effects in comparison to bilinguals

who are equally proficient in both of their languages (Ayçiçegi & Harris, 2004; Dawaele & Pavlenko, 2002). Accordingly, we expect that:

Hypothesis 2a: There will be a significant difference in the recall rate of emotionally charged words, when the language of presentation is Arabic versus English, for late bilinguals.

Hypothesis 2b: There will be a minimal significant difference in the recall rate of emotionally charged words, when the language of presentation is Arabic versus English, for early bilinguals.

In addition to emotionally charged words, even universally neutral words could trigger emotional responses in certain cultures, if they pertain to cultural values, norms, and socio – political contexts. According to the present study, such words are defined as culture – specific emotionally charged words. In the context of Lebanon, these words pertain to politics and religion, because Lebanon is a highly sectarian country with ongoing political discord that is both inter – sectarian and intra – sectarian (Saab, 2007). Consequently, the Lebanese people tend to display high levels of sectarianism and perceived intergroup threats among each other ("The Lebanese Follow Their Leaders", 2007). Since political matters arouse the Lebanese population, words pertaining to this topic should produce similar attentional and memory effects as universal emotionally charged words. Thus, we propose that:

Hypothesis 3a: Participants will recall culture – specific emotionally charged words at a significantly greater rate than neutral words in the first language.

Hypothesis 3b: Participants will recall culture – specific emotionally charged words at a significantly greater rate than neutral words in the second language.

Since the present study assumes that culture – specific emotionally charged words will produce similar emotion – memory effects as universal emotionally charged words, it also

assumes that the magnitude of the emotionality effect for culture – specific emotionally

charged words, will depend on the age of second language acquisition, and the proficiency

level of L2, because research has shown that, these two variables play a role in the

emotionality effect (Anooshian & Hertel, 1994; Bloom & Beckwith, 1987; Christianson &

Fallman, 1990; Dewaele, 2004; Dawaele & Pavlenko, 2002; Eilola et al., 2007; Sutton et al.,

2007). Therefore, we expect that:

Hypothesis 4a: There will be a significant difference in the recall rate of culture – specific

emotionally charged words, when the language of presentation is Arabic versus English, for

late bilinguals.

Hypothesis 4b: There will be a minimal significant difference in the recall rate of culture –

specific emotionally charged words, when the language of presentation is Arabic versus

English, for early bilinguals.

We also propose two exploratory hypotheses pertaining to linguistic proficiency and

explicit arousal ratings. Previous studies have investigated the relationship between linguistic

proficiency and the emotionality effect using the FAS task (Aycicegi – Dinn & Caldwell –

Harris, 2009; Ferre et al., 2010), the word – association task (Anooshian & Hertel, 1994), and

self – reports (Aycicegi – Dinn & Caldwell – Harris, 2009; Aycicegi & Harris, 2004; Ferre et

al., 2010). None of these tasks, however, are suitable for measuring the proficiency level of the

Lebanese population, because they do not account for the linguistic complexity typical to

Lebanon. Such complexity arises firstly from the fact that a large portion of the population,

especially the youth, is not bilingual but multilingual. Secondly, the linguistic complexity of

Lebanon is associated with highly differential use of languages across different situations. For

example, for student population, Arabic is likely to be the language of social interaction, but

unlikely to be used for reading, and studying in general. Therefore, measures of proficiency in a complex linguistic environment should take into account multiple factors such as the frequency of L2 use in certain contexts (e.g., work, home, party), with certain people (e.g., family, friend, classmates), and for specific activities (e.g., watching TV, reading on the internet, writing an article). Considering that previous studies on the emotionality effect have not addressed linguistic proficiency from such a complex perspective, we propose that:

Hypothesis 5: The recall rate of universal emotionally charged words and culture –specific emotionally charged words will vary depending on the sub – factors of language proficiency: frequency of L1/L2 use, the context of L1/L2 use, the activity of L1/L2 use, the preference of L1/L2 use.

The emotionally charged words that are typically used in studies on emotion – memory effects are words taken from Bradley and Lang's (1999) Affective Norms for English Words (Kesinger, 2004, 2008; Kesinger & Corkin, 2003; LaBar & Phelps, 1998; MacKay et al., 2004), Toglia and Battig's (1978) Handbook of Semantic Word Norms (Aycicegi & Harris, 2004; Aycicegi – Dinn & Caldwell – Harris, 2009), and Bellezza, Greenwald, and Banaji's (1986) Word Norms (Jay et al., 2008), which contain ratings of pleasure (Bellezza, Greenwald, & Banaji, 1986; Bradley & Lang, 1999; Toglia & Battig, 1978) as well as arousal (Bradley & Lang, 1999). Furthermore, the results of these studies indicate that the words that have been previously rated as arousing tend to be more memorable. The culture – specific emotionally charged words selected for the present study, however, do not have such extensively tested prior ratings; therefore, we intend to explore whether the variability of the memory for culture – specific emotionally charged words can be explained by the arousal ratings these words receive from the participants.

Hypothesis 6: Culture – specific emotionally charged words that receive higher ratings of arousal will be recalled at a significantly greater rate than words that receive lower ratings.

5. Method

5.1. Participants

The sample entailed 76 students (37 males and 39 females) taking the Introduction to Psychology course at the American University of Beirut. More specifically, the sample encompassed participants who: 1) were of Lebanese origin, 2) have resided in Lebanon for the past five years, 3) identified Arabic as the native language and English as the second language. Participants of other nationalities were excluded from the present study because the culture – specific emotionally charged words that were used, pertained specifically to the Lebanese socio – political culture.

The participants were recruited in the fall semester 2015, in accordance with the Interim guidance for Access to the Psychology 201 Student Pool for Research. The course instructor informed students enrolled in PSYC 201, about the opportunity of obtaining an extra course credit by participating in a research study. Those who did not want to participate in a study, but still wished to earn research credit were given the alternative of writing a brief psychology report. Additionally, advertisements were displayed across the department of psychology for any interested students. The advertisement (see Appendix A) invited the students to participate in a study that intended to explore the relationship between emotionality and perception. Since the true purpose of the current experiment was to assess the automatic processing of the emotionally charged words, information regarding the memory test was withheld from the participants in order to avoid conscious rehearsal.

The final sample entailed participants who: 1) were of Lebanese origin, 2) have resided in Lebanon for the past five years, 3) identified Arabic as the native language and English as the second language. Participants of other nationalities were excluded from the present study because the culture – specific emotionally charged words that were used, pertained specifically to the Lebanese socio – political culture.

5.2. Variables and Measures

 L2 proficiency and acquisition time. The language proficiency and the time of L2 acquisition was measured using a modified version of L2 Language History Questionnaire (see Appendix B) developed and made available for public use by Brain, Language, and Computation Lab, Penn State University. The questionnaire was modified on the basis of Slobodenyuk, Jraissati, Kanso, and El Hajj (2013) study that showed that some questions from the original questionnaire were not suitable for the Lebanese context.

 Memory. A list of 48 words was used for the memory task. The final list consisted of 16 neutral words, 16 emotionally charged words (eight positive and eight negative), and 16 culture – specific emotionally charged words (see Appendix C). The neutral words and the emotionally charged words were selected on the basis of the Affective Norms for English Words (ANEW; Bradley & Lang, 1999). The ANEW consists of over 1000 affective stimuli that have been rated in terms of pleasure, arousal, and dominance. It was developed in order to provide researchers interested in studies of emotion and attention with a set of standardized stimuli (Bradley & Lange, 1999). The present study selected neutral words that were moderate in valence and low in arousal, positive words that were high in both valence (high pleasure) and arousal, and negative words that were low in valence (low pleasure) and high in arousal. The list of selected words has been previously matched on frequency, concreteness, and word

length, and is also consistent with previous studies (Anooshian & Hertel, 1994; Ayçiçegi –

Dinn & Caldwell – Harris, 2009; Aycicegi & Harris, 2004; Harris, Gleason, & Aycicegi,

2006). After the selection process, the words were translated to Arabic by the authors.

The culture – specific emotionally charged words, on the other hand, were initially

generated by the authors, who chose Arabic words that potentially pertained to the socio –

political context of Lebanon. After the selection process, these words were translated to

English by the authors. Then they were checked with the normative ratings of the ANEW, in

order to confirm that they are universally neutral. None of the culture – specific emotionally

charged words were available in the ANEW since it contained a limited number of stimuli.

After the translations of the selected words were validated by expert translators, the

authors constructed four stimuli lists that comprised the three word categories and their

translated counterparts. Each list was divided into two blocks, so that one block of words was

presented in English, while, the other block was presented in Arabic. That is, four different

versions of the survey battery (see Appendix D) were created in order to counterbalance the

order of the word categories and the language of presentation, and thus, prevent the sequence

effect (Mckenna & Sharma, 1995).

5.3. Procedure

Pilot study. Approval from the Institutional Review Board (IRB) was obtained during

the spring semester 2014, yet due to the insufficient number of students, both the pilot and the

main study were conducted during the fall semester 2015. The pilot study intended to verify

whether the selected stimuli qualify as culture – specific emotionally charged words and can be

used in the main study (see Appendix E). Five Lebanese undergraduate students from the

American University of Beirut were given an online Lime survey that asked them to rate

sixteen words in terms of cultural significance (how relevant is this word to the Lebanese socio – political context) and valence (positive vs. negative), using a 5 – point Likert scale. Since the words received high ratings on both dimensions, this indicated that they can be considered culture – specific emotionally charged words within the Lebanese context.

Main study. A within – participant and within – item design was implemented, so that, all the participants observed the same number of stimuli in all word categories and in both languages. The participants were randomly assigned to one stimulus list, so that any given word was presented to different participants in Arabic or English. The study was conducted using an online Lime survey platform. Student volunteers received a link on their email address that led them to their assigned version of the Lime survey battery. The survey battery encompassed six components in the following order: an introduction to the survey (see Appendix F), the informed consent form (see Appendix G), the rating task, the L2 Language History Questionnaire, the memory task, and the debriefing form (see Appendix H).

After pressing on the link, the participants received an automatic message that informed them about the nature of the survey, followed by an informed consent form. After reading the informed consent form, those interested in participating were instructed to click on the "I agree" button. The next display on the screen consisted of a rating task, which instructed the participants to rate the arousal level of the 48 stimuli using a 5-point Likert scale (from "non – arousing " 1 to "highly arousing" 5). The purpose of the rating task was to induce elaborative processing of the words and, in turn, benefit the participants' retention (Anooshian & Hertel, 1994; Craik & Lockhart, 1972). Each word appeared on the computer screen for 10 seconds, in order to give the participants enough time to read and rate each word (Anooshian & Hertel, 1994), and in order to ensure that every word received equal processing time. Even if the

participants required less than 10 seconds to rate each word, they were still not allowed to proceed to the next word until the allotted time was done. After the arousal level of all the words was rated, the participants were presented with an L2 Language History Questionnaire, which gathered information regarding their language proficiency. Upon completing the questionnaire, the participants were given an unexpected free recall test that required them to type as many of the 48 words as they can remember (in the original language of presentation) within a 15 minute time span. At the end of the survey battery, the participants were presented with a debriefing form that discussed the passive deception used in the study (withholding information regarding the surprise memory task) and the true purpose of this study. Participants, who permitted the investigators to use the obtained data, were required to click on the "I agree to the above terms" button. Finally, they were thanked for their effort.

6. Results

This chapter encompasses a preliminary analysis section that consists of a missing value analysis, normality assumptions, and an outliers analysis. The following sections contain psychometric properties, descriptives, and a correlation matrix. The chapter concludes with the main analysis (Factorial ANOVA).

6.1. Sample Descriptives and L2 Language History Questionnaire

After analyzing the data using SPSS FREQUENCIES, the descriptive statistics revealed that the total number of participants was 76, with 37 males and 39 females. The ages of the participants ranged from 18 to 21 years old (M= 18.80, SD=0.71). The participants' years of residency ranged from 5 years to 21 years (M = 17.17 years, SD: 4.09), but the majority of the participants (46%) resided in Lebanon for 19 years. The participants acquired their English language (L2) at a very young age both at home (M = 3, SD = 1.57) and at school (M = 4.5, SD

= 2.09). Yet 55% of the participants believed that they mostly acquired their L2 through people interactions compared to 18.4% of those who believed that they acquired their L2 through classroom instructions. Apart from acquiring English as a second language, 88.16 % of the participants acquired a third language, and 11.8% also acquired a fourth language. These languages ranged from French and Armenian to Spanish, Italian and German. More specifically, the majority of the participants (71.1%) noted that French was their third language, and the majority noted that Spanish and Italian as their fourth language. Furthermore, the average number of years learning L2 (M= 14.47, SD = 2.53) was significantly higher than the average number of years spent learning a third language (M = 11.1, SD = 3.85) or a fourth language (M= 3.78, SD = 1.99).

In terms of L2 proficiency, 37 participants (48.7%) perceived their reading proficiency to be native like, while, 6 participants (7.9%) perceived their reading proficiency to be good. In terms of writing proficiency, 25 participants (32.9%) perceived their writing ability to be native like, while, 18 participants (23.7%) perceived their writing ability as good, and 2 participants perceived their writing ability as functional (2.6%). In terms of speaking fluency, 26 participants (34.2%) perceived their speaking fluency to be native like, while, 22 participants (28.9%) perceived their speaking fluency to be good, and 3 participants (3.9%) perceived their speaking fluency to be functional. In terms of listening ability, 36 participants (47.4%) perceived their listening ability to be native like, while, 9 participants (11.8%) perceived their listening ability to be good, and one participant (1.3%) perceived their listening ability to be functional.

Even though the participants acquired Arabic and English at similar ages, they still tended to use their first language (M= 54.01%), 15% more than their second language (M= 39%), and 40% more than their third language (M= 10%).

In terms of preferences, the participants tended to watch an average of 1.67 hours (SD = 1.84) of television in L1, compared to 2.69 hours (SD = 2.61) of Television in L2, and 0.51 hours (SD=0.84) of television in L3.

The participants tended to read an average of 0.62 hours in L1 (SD = 0.98), compared to 1.39 hours (SD = 1.32) in L2, and 0.38 hours in L3 (SD = 0.51). A similar trend was found for reading for work. That is, the participants tended to read an average of 0.55 hours (SD = 1.07) in L1, compared to 3.80 hours (SD = 2.43) in L2, and 0.79 (SD = 1.60) in L3. The participants similarly preferred to read internet articles in English. For, they tended to read an average of 0.95 hours (SD = 1.66) in L1, compared to 2.77 hours (SD = 2.02) in L2, and 1.01 hours (SD = 1.92) in L3.

In terms of writing an email to friends, the participants tended to write an average of 0.60 hours (SD = 1.70) in L1, compared to 1.77 hours (SD = 1.89) in L2, and 0.48 hours (SD = 0.81) in L3. A similar trend was found for writing an article, since the participants wrote an average of 0.46 hours (SD = 1.32) in L1, compared to 1.99 hours (SD = 1.92) in L2, and 0.57 hours (SD = 1.08) in L3.

Finally, in terms of speaking with family members, friends, classmates, coworkers and others. The participants tended to speak an average of 4.54 hours (SD = 4.88) to family members in L1, compared to an average of 1.11 hours (SD = 1.81) in L2. The participants tended to speak an average of 2.62 hours (SD = 4.25) with their spouse in L1, compared to an average of 1.59 hours (SD = 2.46) in L2. Similarly, they tended to speak an average of 4.51

hours (SD = 4.51) to friends in L1 compared to an average of 3.01(SD = 2.63) in L2. An

opposite trend was found for classmates and coworkers. That is, the participants spoke an

average of 2.55 hours (SD = 3.90) to coworkers in L1, compared to an average of 1.96 hours

(SD = 3.57) in L2. Similarly, they spoke an average of 2.95 hours (SD = 3.37) with classmates

in L1, compared to an average of 3.06 (SD = 3.41) in L2.

The results also showed that the language of instruction during school and college, was

English (L2) for the majority of the participants. More specifically, 40. 8% of the participants

were taught in English during primary school compared to 30.3% who were taught in French,

and 14.5% who were taught in Arabic. In terms of secondary school, 53.9% of the participants

were taught in English, compared to 26.3% who were taught in French and 3.9% who were

taught in Arabic. In terms of high school, 63.2% of the participants were taught in English,

compared to 22.4% who were taught in French and 1.3% who were taught in Arabic. Finally,

in terms of college, the language of instruction in college was in English for 98.7%.

The results show that a significant portion of the participants prefer using their first

language at home (85.5%), and their second language during work (73.7%). Yet within social

settings such as parties, almost half of the participants prefer to use Arabic (47.4%) while the

other half prefer to use English (M = 50%). According to the participants, their language

preference in general leaned slightly more towards Arabic (52.6%) than English (47.4%).

Even though the language preference was almost equal between Arabic and English,

the participants clearly preferred to express their affection/anger in Arabic (M = 71.1%) rather

than English (M = 27.6). Similarly, 65.8% of the participants tended to dream in Arabic

compared to 31.6% who tended to dream in English. Yet when it came to mathematical

calculations, a significant portion of the participants (M = 82.9) preferred to use English rather than Arabic (M = 15.8%).

6.2. Preliminary Analysis

6.2.1. Missing Value Analysis

The gathered data did not contain any missing values because the Lime Survey software prevented the participants from skipping any question in the rating task, the language questionnaire, and the recall task. The final sample consisted of 76 participants, of which 37 were males and 39 were females.

6.2.2. Univariate and Multivariate Outliers

Univariate outliers were inspected using boxplots and z – scores across the independent variables (language of presentation, and word categories), the covariates (level of language proficiency, and age of acquisition), and the dependent variable (recall of stimuli). No univariate outliers were found in the data set, since none of the cases exceeded the value of 3.29. Multivariate outliers were also inspected through Mahalanobis distance. There were no multivariate outliers in the data, since none of the cases had a Mahalanobis Distance greater than $\chi2$ (7) = 16.29, p < .001. Since the data set did not contain any univariate or multivariate outliers, none of the cases were deleted.

6.2.3. Assumption of Normality

The assumption of normality was tested on the dependent variable (recall of stimuli) and the covariates (level of language proficiency and age of L2 acquisition), using the Kolmogorov- Smirnov test as well as the Z scores (see Appendix I). The Kolmogorov – Smirnov test indicated that when the language of presentation was Arabic, the distribution of scores on the recall of culture - specific emotionally charged words, D (76) = .12, p <.05,

emotionally charged words, D (76) = .17, p < .05, and neutral words, D (76) = .23, p <.05, was

significantly non normal. However, upon inspecting the z –scores for skewness, it was found

that the z scores were below the criterion 1.96. This suggests that the assumption of normality

has been met for all the word categories, in the L1 variable.

The Kolmogorov - Smirnov also indicated that when the language of presentation was

English, the distribution of scores on culture - specific emotionally charged words, D (76) =

.19,p < .05, emotionally charged words, D (76) = .14, p <. 05, and neutral words, D (76) = .17,

p < .05, were significantly non normal. Nevertheless, upon inspecting the z – scores for

skewness, it was found that the z scores that were below the criterion 1.96. This implies that

the assumption of normality has been met for all the word categories, in the L2 variable.

In regards to the covariates, the Kolmogorov – Smirnov test revealed that the

distribution of scores on level of proficiency, D (76) = .11, p <. 05, and age of L2 acquisition,

D (76) = .53, p < .05, was significantly non – normal. However, upon inspecting the z –scores

for skewness, it was found that the z scores of the level of L2 proficiency covariate were below

the criterion 1.96. This suggests that the assumption of normality has been met for the level of

proficiency covariate, and violated for the age of second language acquisition covariate.

6.2.4. Assumption of Homogeneity of Variance

The assumption of Homogeneity of Variance was tested using the Levene test (see

Appendix I). The Levene test showed an insignificance for the recall of Arabic culture –

specific emotionally charged words, F (1, 74)= .20, p>.05, ns, the recall of Arabic emotionally

charged words, F (1, 74)= 2.95, p>.05, ns, as well the recall of Arabic neutral words, F (1, 74)=

.06, p>.05, ns. Thus, the assumption of homogeneity of variance was met for all the word

categories when the language of presentation was Arabic.

Moreover, the Levene test also revealed an insignificance for the recall of English culture - specific emotionally charged words, $F (1, 74)= .11$, $p>.05$,ns, the recall of English emotionally charged words, $F (1, 74)= .98$, $p>.05$,ns, and the recall of neutral words $F (1, 74)= .18$, $p>.05$,ns. This signifies that the assumption of homogeneity of variance was met for the word categories when the language of presentation was English.

6.3. Psychometric Properties

6.3.1. Reliability Analysis

A reliability analysis was conducted in order to determine the internal consistency of the culture - specific emotionally charged word category, the emotionally charged word category, and the neutral word category. Each word category consisted of 16 items.

Overall, the culture - specific emotionally charged word category had good reliability with a Cronbach's α of .81. The emotionally charged word category had adequate reliability with a Cronbach's α of .74. Even though deleting the item "party" would have increased Cronbach's α to .75, the item was still maintained because the reliability of this word category was high. Finally, the neutral word category had satisfactory reliability with a Cronbach's α of .79. Even though deleting the item "book" would have increased Cronbach's α of .81, the item was still retained because the reliability of this word category was high.

An additional reliability analysis was conducted in order to examine the internal consistency of the L2 Language History Questionnaire. The analysis revealed that the language proficiency scale had good reliability with a Cronbach's α of .83. Similarly, the age of L2 exposure scale and the years of learning a language scale had good reliability with a Cronbach's α of .83. The frequency of language use per activity scale had excellent reliability with a Cronbach's α of .91. Yet, the language of preference scale had adequate reliability with

a Cronbach's α of .76. Finally, the language of instruction scale had adequate reliability of .74. Even though deleting the item "college language of instruction" would have increased Cronbach's α to .82, the item was still retained because the reliability of this scale was high.

6.4. Descriptive Statistics

The eight items of each word category (culture - specific emotionally charged words, emotionally charged words, and neutral words) were averaged using the SPSS compute option in order to produce aggregate scores for each language of presentation variable (Arabic and English). Table 1 (see Appendix J) shows the means and standard deviations of all the variables. Overall, the participants rated culture – specific emotionally words and emotionally charged words well above the midpoint (m = 2.5), yet they rated neutral words significantly below the midpoint. This indicates that words associated with sociopolitical cultural concepts and emotional concepts tended to evoke significantly higher levels of arousal in comparison to words associated with neutral concepts.

When the language of presentation was Arabic, emotionally charged words received the highest arousal ratings (M = 3.95, SD = 0.59) in comparison to culture - specific emotionally words (M = 3.22, SD = 0.69), and neutral words (M = 1.51, SD = 0.48). A similar trend was found when the language of presentation was English, since emotionally charged words once again received the highest arousal ratings (M = 3.97, SD = 0.50), followed by culture – specific emotionally words (M = 3.11, SD = 0.63), and neutral words (M = 1.49, SD = 0.38).

The overall recall rate of the participants ranged from three words to 26 words (M = 12.05, SD = 5.16). When the language of presentation was Arabic, the recall rate of culture - specific emotionally words ranged from no words to eight words (M = 2.37, SD = 1.87). The recall rate of emotionally charged words ranged from no words to six words (M = 1.89, SD =

1.50), and the recall rate of neutral words ranged from no words to four words (M = 1.26, SD = 1.23). This indicates that the participants remembered a higher number of culture – specific emotionally charged words in comparison to emotionally charged words and neutral words.

Nevertheless, when the language of presentation was English, the recall rate of culture - specific emotionally words ranged from no words to six words (M = 2.12, SD = 1.67). The recall rate of emotionally charged words ranged from no words to six words (M = 2.55, SD = 1.52), and the recall rate of neutral words ranged from no words to six words (M = 1.86, SD = 1.28). This suggests that the participants recalled a higher number of emotionally charged words in comparison to culture – specific emotionally charged words and neutral words.

In terms of L2 proficiency, the participants' level of English fluency ranged from 4.75 to 7 (M = 6.19, SD= .63). This indicates that the average fluency of the participants was at a very good level, with the lowest fluency being at a functional level and the highest fluency being at a native – like level.

In terms of age of L2 acquisition, 75 participants (99%) were identified as early learners because they were exposed to English at the age of seven or earlier, while one participant (1%) was identified as a late learner because he was exposed to English at eight years old. More specifically, the participants were exposed to the skill of speaking English (M = 3.5 years old) at an earlier age than reading (M = 4.5 years old) and writing (M = 5 years old). Since the L2 acquisition covariate produced a ceiling effect with 99% of the participants being early learners, it was dropped from the analysis.

6.5. Correlation between Covariate and Dependent Variable

A Pearson's correlations table was produced in order to observe the correlation between the covariate (level of L2 proficiency) and the dependent variable (recall of stimuli). Table 2

shows that the correlation between the covariate and the dependent variable was not

significant. Thus, the covariate was dropped from the analysis.

Table 2 Correlation between the Level of L2 Proficiency Covariate and the Dependent
Variable

	L2 proficiency	Recall of Arabic culture - specific words	Recall of Arabic emotionally charged words	Recall of Arabic neutral words	Recall of English culture – specific words	Recall of English emotionally charged words	Recall of English neutral words
L2 proficiency	1.00	-.12	-.13	-.19	-.03	.13	.01

**.Correlation is significant at the 0.01 level (2-tailed).
*.Correlation is significant at the 0.05 level (2-tailed).

6.6. Correlation Matrix

A Pearson's correlations table was produced in order to observe the correlation between

the independent variables (language of presentation and word category) and the dependent

variable (recall of stimuli). Table 3 (see Appendix K) shows that none of the variables were

correlated above 0.8, which signifies that the assumption of multicollinearity was met. Overall,

the word ratings produced low to moderate correlations with the word recall.

The correlation matrix table indicated that, correlations existed among the arousal

ratings and the word recall. For example, when the language of presentation was English, the

arousal ratings of emotionally charged words had a significant low positive correlation with the

recall of English emotionally charged words ($r = .27$, $p < .05$). Similarly, the arousal ratings of

neutral words had a significant medium positive correlation with the recall of English neutral

words ($r = .35$, $p < .05$). This indicates that when the words were presented in the second

language of the participants, the perceived arousal level of neutral and emotionally charged

words significantly affected their recall, while, the perceived arousal level of culture – specific emotionally charged words did not influence their recall. On the other hand, when the language of presentation was Arabic, the arousal ratings of the word categories did not produce any significant correlations with the word recall. This implicates that when the words were presented in the first language of the participants, the perceived arousal levels of the words did not have any effect on their recall.

The correlation matrix table also showed that, correlations existed among the arousal ratings of stimuli, which were within the same word category. For example, the ratings of Arabic culture - specific emotionally charged words had a significant medium positive correlation with the ratings of English culture - specific emotionally charged words ($r = .49$, $p < .05$). The ratings of Arabic emotionally charged words had a significant low positive correlation with the ratings of English emotionally charged words ($r = .27$, $p < .05$). The ratings of Arabic neutral words had a significant large positive correlation with the ratings of English neutral words ($r = .52$, $p < .05$). This signifies that to a certain extent, the participants gave stimuli within the same word category, similar ratings regardless of the language of presentation. That is, culture - specific emotionally charged words and neutral words produced highly similar levels of arousal, whether they were presented in Arabic (L1) or English (L2).

6.7. Main Analysis

A factorial ANOVA was conducted after the assumptions of the independence of scores, normality, and homogeneity of variances were all met. The 2 (language of presentation) x 3 (word category) factorial ANOVA was conducted on the recall of words separately, through SPSS GENERAL LINEAR MODEL function.

6.7.1. *Statistical Assumptions*

Sphericity. Due to the nature of repeated-measures ANOVA, the independence of scores in the experimental condition was automatically violated. Hence, to check whether the dependence of scores between the experimental conditions was equal, the assumption of sphericity was tested (see Appendix L). When the language of presentation was Arabic, the assumption of sphericity was violated, $\chi2$ (2) =10.01, p < .05. Since (ε) = .89, the Huynh - Feldt correction was used to detect main effects. Moreover, when the language of presentation was English, the assumption of sphericity was also violated, $\chi2$ (2) =5.92, p < .05. Since (ε) = .93, the Huynh - Feldt correction was used to detect main effects.

6.7.2. *Main Effects of Arabic Language of Presentation*

When the language of presentation was Arabic, the arousal ratings of the word categories had a significant effect on word recall, F (1.82, 136.15) = 15.89, p < .05, partial η^2 = .18. This indicates that the participants' recall significantly varied according to the language of presentation, and the word category. In order to test H1a, H1b, H3a, and H3b, post – hoc tests of adjusted means were conducted (see Appendix L).

Adjusted Means. The means for the recall of Arabic words by word category were adjusted. Table 4 shows the adjusted means for the recall of culture – specific emotionally charged words, emotionally charged words, and neutral words. Figure 1 shows that the mean of the recall of culture – specific emotionally charged words was the highest, followed by emotionally charged words, and neutral words.

Table 4 Adjusted Means of the Recall of L1 Words

Language of Presentation	Recall of Word Category	Mean	Std. Error
Arabic	Recall of culture – specific words	2.37	.21
	Recall of emotionally charged words	1.90	.17
	Recall of neutral words	1.26	.14
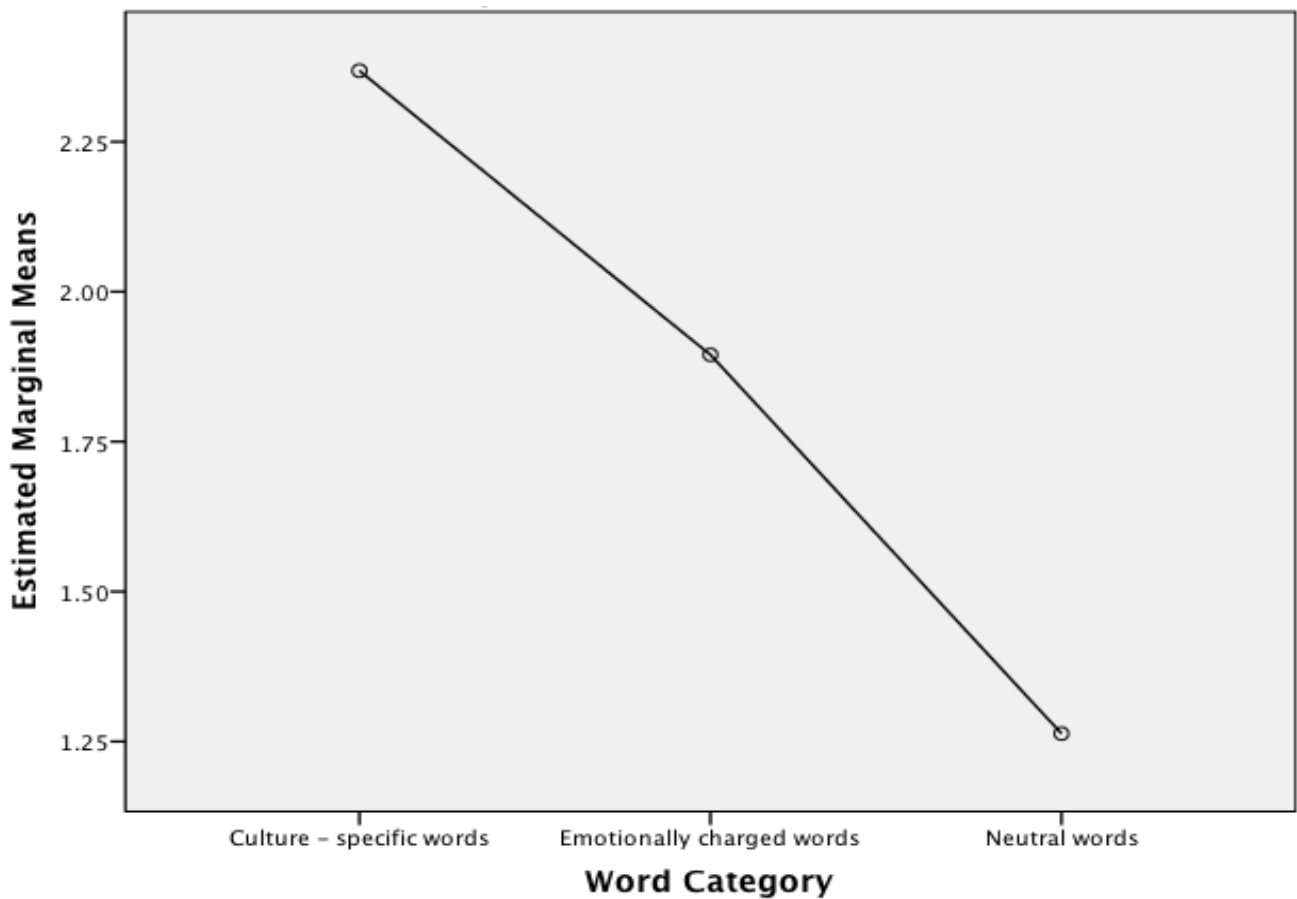
Figure 1. The mean recall of culture – specific emotionally charged words, emotionally charged words, and neutral words, in the Arabic (L1) language.

Post Hoc Test. Post hoc tests were used to compare the differences across the conditions. Pair-wise comparisons with Bonferroni corrections were used to test H1a that emotionally charged words will be recalled more than neutral words, and H3a, that culture – specific words will be recalled more than neutral words, when the language of presentation is Arabic (L1).

When the language of presentation was Arabic, the participants recalled emotionally charged words significantly more than neutral words. **Thus, hypothesis 1a was confirmed**. Pairwise comparisons also showed that the participants recalled culture - specific words significantly more than neutral words. **Hence, hypothesis 3a was confirmed.**

6.7.3. *Main Effects of English Language of Presentation*

When the language of presentation was English, the arousal ratings of the word categories had a significant effect on word recall, $F (1.90, 142.68) = 4.79$, $p < .05$, partial $\eta^2 =$ .06. This indicates that the participants' recall significantly differed according to the language of presentation and the word categories (see Appendix M).

Adjusted Means. The means for the recall of English words across the word category were adjusted. Table 5 shows the adjusted means for the recall of culture – specific emotionally charged words, emotionally charged words, and neutral words. Figure 2 shows that the mean of emotionally charged words was the highest, followed by culture – specific emotionally charged words, and neutral words.

Table 5 Adjusted Means of the Recall of L2 Words

Language of Presentation	Recall of Word Category	Mean	Std. Error
English	Recall of culture – specific words	2.12	.19
	Recall of emotionally charged words	2.55	.17
	Recall of neutral words	1.86	.15
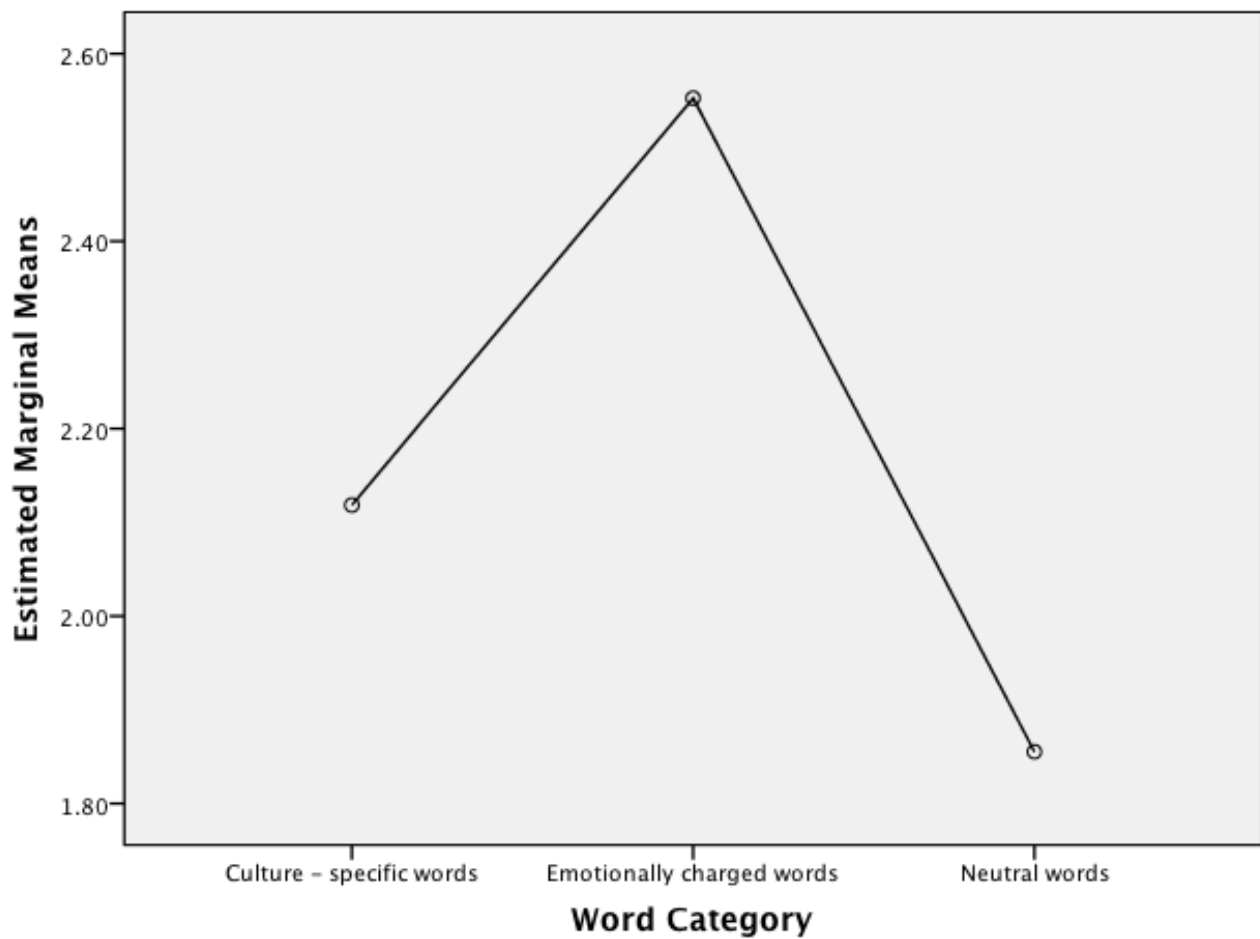
Figure 2. The mean recall of culture – specific emotionally charged words, emotionally charged words, and neutral words, in the English (L2) language.

Post Hoc Tests. Post hoc tests were used to compare the differences across the conditions. Pair-wise comparisons with Bonferroni corrections were used to test H1b that emotionally charged words will be recalled more than neutral words, and H3b that culture specific words will be recalled more than neutral words, when the language of presentation is English (L2).

When the language of presentation was English, the participants recalled emotionally charged words significantly more than neutral words. **Thus, hypothesis 1b was confirmed.** Pairwise comparisons also revealed that the participants recalled culture specific emotionally charged words more than neutral words. **Hence, hypothesis 3b was supported.**

6.7.4. Correlation Matrix of Culture – Specific Emotionally Charged Words

A Pearson correlation table was produced in order to test H6 that culture – specific emotionally charged words that receive higher ratings of arousal will be recalled at a greater rate than the words that receive lower ratings. Table 6 indicated that, whether the language of presentation was Arabic (L1) or English (L2), a non significant correlation was found between the arousal ratings of culture specific emotionally charged words and the recall of culture – specific emotionally charged words. Since culture – specific emotionally charged words that evoked higher arousal ratings, were not recalled at a greater rate, this signifies that **hypothesis 6 was not supported.**

Table 6 Correlation Matrix of the arousal ratings and the recall of culture – specific emotionally charged words in Arabic (L1)

		Arabic culture - specific words	Recall of Arabic culture -specific words
Arabic culture – specific words	Pearson Correlation	1.00	.14
	Sig. (2-tailed)		.23
Recall of Arabic culture - specific words	Pearson Correlation	.14	1.00
	Sig. (2-tailed)	.23	

Table 7 Correlation Matrix of the arousal ratings and the recall of culture – specific emotionally charged words in English (L2)

		English culture - specific words	Recall of English culture - specific words
English culture specific words	Pearson Correlation	1.00	.19
	Sig. (2-tailed)		.11
Recall of English culture specific words	Pearson Correlation	.19	1.00
	Sig. (2-tailed)	.11	

7. Discussion

The present study investigated the effect of the word category (culture – specific emotionally charged words, emotionally charged words, and neutral words) and the language of presentation (Arabic versus English) on the word recall, while taking into account the effect of the level of L2 proficiency. The novelty of the present study is that it introduced the notion of culture – specific emotionally charged words, and it investigated the emotionality effect of

Arabic/ English bilingual students. In line with the literature and the hypotheses, the present study found an emotionality effect in the native language and the second language of the participants. Yet unlike previous studies, the results indicated that stronger emotion – memory effects occurred in L2 than L1. Additionally, the present study failed to find the expected relationship between the level of L2 proficiency and the emotionality effect. It also failed to find the expected relationship between the arousal ratings of culture – specific emotionally charged words and their recall.

7.1. Emotionality Effect in L1 and L2

Previous studies have found that emotionally charged words possess an attention – capturing mechanism that enhances their memorability (Altarriba & Bauer, 2004; Arnell et al., 2007; Mckena & Sharma, 1995; Pavlenko, 2008; Sutton & Alberta, 2007). Due to this attentional advantage, emotionally charged words tend to be recalled at a greater rate than neutral words (Ferre, 2003; Jay et al., 2008; Kesinger & Corkin, 2003). This is known as the emotionality effect and it has been demonstrated on bilinguals' first and second language (Anooshian & Hertel, 1994; AyçiçeğI – Dinn & Caldwell – Harris, 2009; Ayçiçegi & Harris, 2004). Previous studies have examined the emotion – memory effects of bilingual individuals who spoke: Spanish/English (Anooshian & Hertel, 1994; Sutton et al., 2007), Turkish/English (Aycicegi & Harris, 2004; Aycicegi – Dinn & Caldwell – Harris, 2009; Harris et al., 2003), Chinese/English (Colbeck & Bowers, 2012), Finish/English (Eilola et al., 2007), Portuguese/ French (Martins, Oliveira, & De Sousa, 2003), and Spanish/Catalan (Ferre, Garcia, Fraga, Sanchez – Casas, & Molero, 2010). The search engines of the Academic databases and journals have shown no publications on the use of Arabic / English bilingual participants in studies

examining the emotionality effect. Consequently, the present study was the first to shed light on the recall differences of emotionally charged words in Arabic versus English.

The findings of the present study confirmed the emotionality effect given that the participants recalled emotionally charged words at a greater rate than neutral words. This effect occurred whether the words were presented in Arabic (L1) or in English (L2) indicating that the participants experienced an emotionality effect in their first and second language due to the attention capturing mechanism of emotionally charged words.

In accordance with findings that have reported a difference in the magnitude of the emotionality effect (Anooshian and Hertel, 1994; Aycicegi and Harris, 2004; Aycicegi – Dinn & Caldwell – Harris (2009), the present study showed that the emotion – memory effects varied across the languages. Yet unlike the aforementioned research, the present study found a larger emotionality effect in L2 rather than L1. That is, emotionally charged words that were presented in English were recalled more frequently than emotionally charged words that were presented in Arabic. Since English words were more memorable than their Arabic counterparts, this signifies that the second language of the participants was more emotionally stimulating than the mother tongue language. In line with Ayçiçegi and Harris (2004)'s argument and the level of processing theory (Craik & Lockhart, 1972), a stronger emotionality effect occurred in L2 because the participants may have translated the English stimuli to Arabic, in order to facilitate the process of rating their arousal level. In turn, the act of translation may have caused the participants to process L2 stimuli at a deeper level than L1 stimuli and, thus, enhanced their retention for English words. An alternative explanation for the emotionality effect in L2 may revolve around the nature of the sample. For instance, since the participants' distinction between L1 and L2 was not as apparent as previous studies, it is

possible that such linguistic properties may have influenced their emotion – memory effects. Due to the significant impact of the participants' linguistic properties on the present findings, a more elaborate analysis will be discussed further into the paper.

7.2. Effect of Arousal Ratings on the Emotionality Effect

Researchers have determined that emotionally charged words capture more attention than other word categories, due to their properties of arousal and valence (Altarriba & Bauer, 2004; Arnell et al., 2007; Mckena & sharma, 1995; Sutton & Alberta, 2007; Pavlenko, 2008). This conclusion was reaffirmed by the present study because the descriptives indicated that emotionally charged words were given significantly higher arousal ratings than neutral words. This effect occurred whether the language of presentation was Arabic (L1) or English (L2). Thus, emotionally charged words tend to capture greater attention because they evoke greater levels of arousal in comparison to neutral words.

In line with previous studies that found a relationship between arousal levels and memorability (Altarriba & Bauer, 2004; Arnell et al., 2007; Mckena & sharma, 1995; Sutton & Alberta, 2007; Pavlenko, 2008), the present study found significant correlations between the arousal ratings of the words and their recall. Emotionally charged words and neutral words that received higher arousal ratings were recalled at a greater rate than the words that received lower arousal ratings. This effect only occurred for words that were displayed in the second language of the participants. Meaning that when the language of presentation was Arabic, the perceived arousal levels of the words did not have any effect on their recall. The non – significant relationship between arousal ratings and recall of Arabic words indicated that the participants recalled more words in English (L2) than Arabic (L1). Hence, the participants had stronger memorability for words in their second language, because the arousal level of English

words enhanced their recall, while the arousal level of Arabic words did not. One possible explanation for this outcome revolves around the participants' age of L2 acquisition. For, all the participants (with the exception of one participant) were early bilinguals who acquired their second language before the age of seven. In line with Bloom & Beckwith (1987)'s argument, since the participants acquired both their first and second language at around the same age, it is highly possible that they associated their emotional experiences with both languages rather than their native language. Moreover, a larger emotionality effect in L2 may have occurred because the majority of the participants were educated in English institutions, and because they significantly used English in educational, social and work settings. The frequent use of L2 across multiple contexts may have caused the participants to associate their emotional experiences with their second language. In turn, this association may have led the participants to perceive English stimuli as more arousing.

7.3. Effect of Age of Second Language Acquisition and Level of L2 Proficiency

In addition to the arousal level of emotionally charged words, researchers have implicated several factors such as, the age of second language acquisition and the level of L2 proficiency, in the mediation of emotion – memory effects. For example, previous studies found that late bilinguals exhibited a larger emotionality effect in L1, compared to their early bilingual counterparts (Bloom & Beckwith, 1987; Dewaele, 2004). Other studies have found that bilinguals, who were less proficient in L2, exhibited a larger emotionality effect in comparison to bilinguals who were equally proficient in L1 and L2 (Ayçiçegi & Harris, 2004; Dawaele & Pavlenko, 2002). In such research studies, the linguistic proficiency of bilingual speakers was measured using self –reports (Aycicegi – Dinn & Caldwell – Harris, 2009; Aycicegi & Harris, 2004; Ferre et al., 2010), or simple fluency tests such as the word –

association task (Anooshian & Hertel, 1994) and the FAS task (Aycicegi – Dinn & Caldwell –

Harris, 2009; Ferre et al., 2010). The current study, however, utilized a more elaborate

proficiency test known as the L2 Language History Questionnaire, because it accounted for

critical variables that pertain to Lebanon's complex linguistic environment, and therefore

yielded a more comprehensive analysis on the relationship between language proficiency and

the emotionality effect.

Another novelty of the present study pertained to the context and its intricate linguistic

nature. Lebanon is a multilingual society that fosters as many as six languages. The official

national language is Arabic, but there are ethnic Lebanese groups that consider other languages

(e.g., Armenian, Greek, and Kurdish) as their first language (Diab, 2010). In addition, a

majority of the Lebanese population speaks a second language and in many cases a third

language. Consequently, Lebanese people tend to use different languages interchangeably

across different contexts (e.g., work, home, social life), with different people (e.g., family

member, friends, coworkers), and in different activities (e.g., watching TV, reading the

internet, writing a paper. This linguistic diversity made Lebanon an enriching and ideal context

to study how certain sub – factors of linguistic proficiency can affect the magnitude of the

emotionality effect.

Despite the intricate proficiency of the Lebanese participants, the present study failed to

find a significant correlation between the level of second language proficiency and the

memorability of the word categories. This denotes that bilinguals, who were less proficient in

their second language, did not experience a larger emotionality effect than bilinguals, who

were highly proficient. Yet, it is highly plausible that the linguistic proficiency of the

participants did not affect their emotional perception of the stimuli, because the present study

solely relied on early bilinguals who were highly proficient in L2, rather than examining participants with varied levels of L2 proficiency.

The current findings on language proficiency can provide valuable insight when they are applied on the educational context of Lebanon. For, the data from the L2 language history questionnaire as well as the results from the arousal task and recall task confirmed the multilingual education of the Lebanese population. For example, the L2 language history questionnaire indicated that the participants were highly proficient in their second language because they acquired it at an early age. Rather than learning English as a second language, the majority of the participants were taught in English (or French) from the primary school level until the university level. The questionnaire also indicated that the majority of the participants were proficient in a third language. As a result of their language proficiency, the results indicated that the participants exhibited stronger emotion – memory effects in the second language because English stimuli evoked stronger arousal effects. All these findings signify that the Lebanese population is proficiently multilingual in comparison to other cultures, which tend to have a large proficiency gap between their native language and their second language. Despite the significant benefits of living in a country that provides linguistic diversity, the results of the present study indicate that the cultural identity of the Lebanese students may be slowly dissolving, since the participants appear to be more proficient and aroused by a foreign language (English) rather than their mother tongue language (Arabic). More emphasis should be placed on the significance of the Arabic language within educational institutions and social contexts in order to ensure that the newer generations do not lose their Lebanese heritage and language.

7.4. Recall of Culture – Specific Emotionally Charged Words

A large body of research has shown that universally neutral words are not as memorable as emotionally charged words, because they do not possess the quality of arousal (Altarriba & Bauer, 2004; Arnell et al., 2007; Mckena & sharma, 1995; Sutton & Alberta, 2007; Pavlenko, 2008). However, we assumed the possibility that some universally neutral words could be considered emotionally charged in specific cultural contexts. This new notion suggests that neutral concepts that pertain to cultural norms, values and socio – political contexts, may evoke similar emotional responses as universal emotionally charged words and, thus, could enhance memory. To our knowledge, no study has investigated the effect of culture – specific emotionally charged words (words of cultural significance) on memory. Accordingly, we hypothesized that the universally neutral words that pertain to the socio – political context of Lebanon should evoke memory effects in the participants, because Lebanese people are highly sectarian and, thus, tend to be aroused by political matters (Saab, 2007; ("The Lebanese Follow Their Leaders", 2007).

The results of the present study confirmed this theory because a significant difference was found in the recall of culture – specific emotionally charged words versus neutral words. This effect occurred whether the words were exhibited in the first or second language of the participants. Moreover, when the language of presentation was Arabic (L1), a large recall difference was found between culture – specific emotionally charged words and neutral words. Yet when the language of presentation was English (L2), the recall difference was notably smaller. In other words, culture – specific emotionally charged words were more memorable in L1 than L2. This effect may have occurred due to the arousal effects of the politically stimulating stimuli. For, the arousal ratings indicated that the participants gave Arabic culture –

specific emotionally charged words higher ratings than English culture – specific emotionally charged words. This signifies that culture – specific emotionally charged words evoke stronger arousal effects when they are stated in the mother tongue of the participants and are, thus, more memorable in L1 than L2. This is an expected outcome, as political discussions, campaigns, and demonstrations that take place in Lebanon, tend to be expressed in the Arabic language. Thus, the Lebanese participants are to feel more aroused and emotionally stimulated by culture – specific emotionally charged words that were presented in their native language. In conclusion, unlike previous studies that claimed an emotionality effect could only occurs for stimuli with negative or positive valence, the present study provided a new finding showing that neutral concepts can evoke emotion – memory effects as long as they pertain to arousing matters that concern the individual.

If the findings on culture – specific emotionally charged words were to be applied on the political context of Lebanon, then it may appear that certain changes should occur in the political strategies that target university students. For, political campaigns that target the general Lebanese population tend to be expressed in Arabic, where as, political campaigns that target university students tend to be expressed in English. University students tend to receive politically oriented advertisements that are written in English, and they tend to discuss political controversies during their university seminars in English. During university elections, students tend to verbalize the views of their political party in English, and they tend to hold banners with English political statements. In other words, political matters tend to be conveyed in the second language of university students rather than their native language. Yet, since the results of the present study indicated that culture – specific emotionally charged words were more memorable in Arabic (L1) than English (L2), this signifies that the participants were more

aroused by political concepts that were exhibited in their first language. This effect occurred even though the participants were university students who were highly proficient in English, and who frequently used English across multiple contexts. Thus, political campaigns that target university students should focus on expressing political stances in Arabic rather than English, in order to evoke higher levels of arousal and emotional stimulation in the students.

7.5. Limitations and Future Research

A major limitation of the present study pertains to the sample size. Seventy-six participants were recruited for the experiment; however, the power table by Cohen (1988, p. 102) suggested that each condition must encompass a minimum group size of 28 participants, in order to obtain a significant effect of .025 (one-tailed), with a statistical power of .80, and an effect size of .50. Thus, the sample size of the present study was not large enough to achieve satisfactory statistical power.

Another limitation pertaining to the sample was that the participants were all recruited from one university, and specifically from one undergraduate course (PSYC 201). This signifies that the results of the present study cannot be generalized to the broader Lebanese population, because the sample solely consisted of students that came from a certain socio-economic background, age group, and had a particular literacy level. On a similar note, it is possible that the present study failed to find a relationship between the arousal levels of culture – specific emotionally charged words and their memorability, because it examined AUB students who were not as acculturated to the socio – political context of Lebanon, as other individuals from different areas of Lebanon.

Since the sample consisted of undergraduate students from the American University of Beirut, this led the majority of the participants to display similar levels of English fluency

(between functional to highly proficient). This was problematic because the invariability of the participants' proficiency prevented the present study from producing a comprehensive analysis that explored the impact of proficiency on the emotionality effect, as other studies have done (Anooshian & Hertel, 1994; Aycicegi & Harris, 2004; Aycicegi – Dinn & Caldwell – Harris, 2009; Ferre et al., 2010; Ferre et al., 2010).

Moreover, the methodological use of an online survey may have additionally weakened the present study because the participants did not complete the survey within a monitored setting. Rather, they were given the freedom to complete the survey using any computer and in any setting (e.g. university, home, coffee shop). Thus, it is highly possible that the participants were exposed to several distractions that may have influenced the manner in which they answered the survey. For example, the participants may have completed the arousal rating section with the assistance of other individuals (e.g. family members, friends), simply because their behavior was not monitored. This is problematic, because the purpose of the rating task was to induce elaborative processing of the words and, in turn, enhance the participants' retention. If the participants did not complete the arousal ratings on their own, this denotes that they did not engage in elaborative processing and, hence, did not experience enhanced memory. Nevertheless, even if the participants completed the arousal ratings on their own, it is still plausible that their attention was not solely dedicated towards the survey battery. For example, the participants may have occupied themselves with other tasks (eg. work related tasks or entertainment related tasks), as they waited for the ten-second time frame to terminate during the rating stage. In turn, the division of the participants' attentional resources may have influenced their processing as well as their retention of the stimuli.

Additionally, the use of the online survey may have contaminated the participants'

performance during the recall stage, because it prevented the investigator from controlling for the context. That is, some participants might have been recalling the words in a quiet atmosphere, while, others might have been recalling the words in a noisy and distracting environment. Hence, the variability of the participants' recall may have been due to the variability of the context, rather than due to emotionality effect. Furthermore, since the participants could complete the survey on their own convenient time, it is also possible that the participants who already completed the survey may have communicated information regarding the experiment, to the other participants who had not begun the survey battery. This is problematic, because it signifies that some participants may have been previously informed about the unexpected recall task and, hence, may have intentionally memorized the stimuli rather than unconsciously processed them.

Lastly, the content validity of the present study was threatened due to the nature of the culture – specific emotionally charged words. Even though a pilot study was conducted on the arousal and valence level of these stimuli, it is possible that these words were rated as culturally arousing, solely according to the perception of the five specific participants who partook in the pilot study. Hence, the words used to represent the culture – specific emotionally charged words category may have not been as culturally arousing as the investigators had presumed.

7.6. Implications for Future Research

For future research, it is recommended that a larger and more diverse sample be used in the experiment in order to produce more representative results that pertain to the general Lebanese population.

The sample should also consist of participants who significantly vary in linguistic proficiency, so that the effect of having high L2 proficiency versus low L2 proficiency can be exhaustively analyzed. This can be achieved by recruiting participants from certain areas of Lebanon, because such individuals tend to significantly diverge in language fluency, educational level, and socio – economic background, in comparison to AUB students. Additionally, recruiting participants from different areas of Lebanon may produce a sample that is more acculturated to the socio – political context of Lebanon. In turn, such a sample may become more aroused by culture – specific emotionally charged words, and thus experience stronger emotion - memory effects.

To improve the methodological procedure, the experiment should be conducted in a structured setting like a computer lab, so that the investigator could monitor the participants' behavior and ensure that they are responding to the survey individually. Completing the survey in the same setting and at the same time will also prevent the participants from communicating information regarding the surprise recall task, to other participants who have not yet engaged in the survey. Thus, this methodological change can improve the validity and reliability of the arousal rating task as well as the memory task.

Future studies should also attempt to develop a set of culture – specific emotionally charged words that are rated by a noteworthy number of Lebanese individuals in terms of arousal and valence, so that researchers who are interested in studies of emotion, language, and cultural significance, could rely on a set of standardized stimuli similar to that of the Affective Norms for English Words (ANEW; Bradley & Lang, 1999).

Appendices

Appendix A. Advertisement for Psychology (201) Student Pool

<u>Invitation to Participate in a Research Study</u>

You are invited to participate in a research study entitled "The recall of culture - specific emotionally charged words by Arabic/English bilingual students" conducted by Dr Nadiya Slobodenyuk, Faculty of Arts and Sciences at the American University of Beirut. The conduct of this study will adhere to the IRB approved conditions and terms.

The IRB approved method for approaching subjects is through the PSYC pool coordinator in accordance with "Interim Guidance for Access to the Psychology (201) Student Pool for Research".

The purpose of the study is to explore the relationship between emotionality of words, perception and linguistics proficiency.

PROCEDURES

This message invites you to read the information about the study and decide whether you want to participate.

Note that:

- *Participation is completely voluntary.*
- *If you agree to participate, completing the questionnaire will take around 60 minutes.*
- *Only the data you provide in the questionnaire will be collected and analyzed.*
- *The results of the survey will be published in the form of a thesis and will be available by the AUB Library in printed form and electronically.*

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

You will not receive payment for participation in this study.
The results of the study will help psychologists understand some aspects of emotional perceptions. You will also learn about current practices of psychological research. Additionally, you will receive a research credit for PSYC-201 course. The refusal to participate or termination of the participation will not result in the loss of benefits and will not affect your relationship with the primary investigator or the department in any way.

Potential risks for participating in this study

The risks of the study are minimal. The collected data will remain confidential and *anonymous*.

CONFIDENTIALITY

Any information that is obtained in connection with this study will remain confidential. *Only you will know that you returned a questionnaire*.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind.

Agreement of Research Subject

If after reading the consent document and having any questions you might have answered to your satisfaction, you voluntarily agree to take part in the study, please follow the link http://surveylgh.limequery.com/index.php/294288/lang-en to complete the study.

Otherwise please ignore this invitation to participate in the study.

In case you have any questions, please contact
Dr. Nadiya Slobodenyuk
Assistant Professor of Psychology,
Department of Psychology
American University of Beirut
e-mail: ns74@aub.edu.lb
phone: *01-350000*   ext: 4366

Appendix B. First/Second Language Proficiency Questionnaire

1.	Age:		
2.	Sex:		
3.	Country of origin:		
4.	Time of residence in the country of origin:		
5.	Time of residence in Lebanon:		
6.	What is your **NATIVE** language?		
7.	What is your **SECOND** language?		
9.	Specify the age at which you started to learn your **SECOND** language in the following situations:	a. at home.	
		b. in school.	
9.	How did you learn your second language up to this point? (circle one of the three options: mainly, mostly or occasionally for questions a, b)	a. through formal classroom instruction.	1. mainly; 2. mostly; 3. occasionally.
		b. through interacting with people.	1. mainly; 2. mostly; 3. occasionally.

10. List all foreign languages you know in order from most proficient to least proficient. Rate your ability on the following aspects in each language. Please rate according to the following scale:

1 – Very poor; 2 – Poor; 3 – Fair; 4 – Functional; 5 – Good; 6 – Very good; 7 – Native-like

Language	Reading proficiency	Writing proficiency	Speaking fluency	Listening ability

11. Provide the age at which you were first exposed to each foreign language in terms of speaking, reading, and writing, and the number of years you have spent on learning each language.

Language	Age first exposed to the language			Number of years learning
	Speaking	Reading	Writing	

12. Estimate, in terms of percentages, how often you use your native language and other languages per day (in all daily activities combined, circle one that applied):

	Specify language	**%**				
First language		<25%	25%	50%	75%	100%
Second language		<25%	25%	50%	75%	100%
Other languages		<25%	25%	50%	75%	100%

13. Estimate, in terms of hours per day, how often you are engaged in the following activities with your native and second languages.

Activities	First Language	Second Language	Other Languages (specify _____)
Listen to Radio/ Watching TV:	_____(hrs)	_____(hrs)	_____(hrs)
Reading for fun:	_____(hrs)	_____(hrs)	_____(hrs)
Reading for work:	_____(hrs)	_____(hrs)	_____(hrs)
Reading on the Internet:	_____(hrs)	_____(hrs)	_____(hrs)
Writing emails to friends:	_____(hrs)	_____(hrs)	_____(hrs)
Writing articles/papers:	_____(hrs)	_____(hrs)	_____(hrs)

14. Estimate, in terms of hours per day, how often you speak (or used to speak) your **FIRST**

	Hours
language with the following people.

	Hours
Father:	(hrs)
Mother:	(hrs)
Grandfather(s):	(hrs)
Grandmother(s):	(hrs)
Brother(s)/Sister(s):	(hrs)
Other family members:	(hrs)
Spouse/partner:	(hrs)
Friends:	(hrs)
Classmates:	(hrs)
Co-workers:	(hrs)

15. Estimate, in terms of hours per day, how often you speak (or used to speak) your **SECOND** language with the following people.

	Hours
Father:	(hrs)
Mother:	(hrs)
Grandfather(s):	(hrs)
Grandmother(s):	(hrs)
Brother(s)/Sister(s):	(hrs)
Other family members:	(hrs)
Spouse/partner:	(hrs)
Friends:	(hrs)
Classmates:	(hrs)
Co-workers:	(hrs)

16. Write down the name of the language in which you received instruction in school, for each schooling level:

	Language
Primary/Elementary School:	
Secondary/Middle School:	

High School:	
College/University:	

17. In which languages do you usually:	
	Language
Count, add, multiply, and do simple arithmetic?	
Dream?	
Express anger or affection?	

18. Among the languages you know, which language is the one that you would prefer to use in these situations?	
	Language
At home	
At work	
At a party	
In general	

Appendix C. Stimuli Categories in English and Arabic

Table B1. Neutral Words

English	Arabic
door	باب
elbow	كوع
month	شهر
window	شباك
table	طاوله
finger	إصبع
name	إسم
street	شارع
chair	كرسي
pencil	قلم
column	عمود
circle	دائرة
tree	شجرة
ink	حبر
book	كتاب
hat	قبعة

Table B2. Emotionally Charged Words

English	Arabic
rape	اغتصاب
anger	غضب
pain	ألم
cancer	سرطان
danger	خطر
war	حرب
destroy	دمر
slave	عبد
love	حب
party	حفلة
friend	صديق
laughter	الضحك
home	بيت
mother	الأمّ
kiss	قبلة
freedom	حرية

Table B3. Culture – Specific Emotionally Charged Words

English	Arabic
elections	انتخابات
government	حكومة
leader	زعيم
religion	دين
sect	حزب
intelligence	مخابرات
explosion	انفجار
refugees	نازحين
camp	مخيم
politics	سياسة
protest	عتصام
military	جيش
checkpoint	حاجز
border	حدود
martyr	شهيد
resistance	مقاومة

Appendix D. Different Versions of the Survey Battery

Table D. Four Versions of the Survey Battery

Version 1	Version2	Version 3	Version 4
Arabic/Culture – specific emotionally charged words	Arabic/Emotionally charged words	English/Emotionally charged words	English/Culture – specific emotionally charged words
Arabic/Emotionally charged words	Arabic/Culture – specific emotionally charged words	English/Culture – specific emotionally charged words	English/Emotionally charged words
Arabic/Neutral words	Arabic/Neutral words	English/Neutral words	English/Neutral words
English/Culture – specific emotionally charged words	English/Emotionally charged words	Arabic/Emotionally charged words	Arabic/Culture – specific emotionally charged words
English/Emotionally charged words	English/Culture – specific emotionally charged words	Arabic/Culture – specific emotionally charged words	Arabic/Emotionally charged words
English/Neutral words	English/Neutral words	Arabic/Neutral words	Arabic/Neutral words

Appendix E. Consent to Serve as a Participant in a Pilot Study for a Research Project

Project title: The recall of culture - specific emotionally charged words by Arabic/English bilingual students

Principal investigator: Dr. Nadiya Slobodenyuk
Assistant Professor of Psychology,
Department of Psychology
American University of Beirut
ns74@aub.edu.lb
tel: 76674558

Nature of the Project:
You are being asked to serve as research participant in a pilot study, for a project conducted by the Department of Psychology at AUB. The purpose of this study is to explore the relationship between emotionality and perception. You must be at least 18 years old to participate.

Explanation of Procedures:
As a research participant you will be asked to complete a simple rating task on a series of words. For this task you will rate the cultural significance and valence level of each word on a 5 – point Likert scale. Your participation in this research should take no more than fifteen minutes. The experiment will be carried out in the psychology lab 107 (Jesup building).

Potential Discomfort and Risks:
The research involves no more than minimal risk, and is not expected to produce any discomfort. You are also free to terminate your participation at any time without any explanation.

Confidentiality:
Data obtained in this study will be encoded and kept **confidential.** You are not required to provide your name, and no identifiable information will be linked to the data you provide. Only information that cannot be traced to you will be used in research reports, and only generalized data from an expected group of 76 participants will be published. Your participation is entirely **anonymous.** Principal investigator and co-investigator are the only people who will have access to raw data.

Potential Benefits:
There are no monetary rewards for participation in this study. By participating you will help psychologists understand some aspects of emotional perceptions. You will also learn about

current practices of psychological research. Additionally, you will receive a research credit for PSYC-201 course.

Alternatives to participation:
If you decide not to participate in this study but still want to earn a research credit for PSYC-201 course, you can do that by writing a brief report. Please contact Dr. May Awaida (mawaida@aub.edu.lb) to learn more about this option.

Withdrawal from the Project:
Your participation in this study is **completely voluntary**. You may choose not to answer some questions in surveys, and you may withdraw from the study at any time without giving any reasons.

Who to Call if You Have Any Questions:
You will be receiving a copy of this consent form with all the necessary contact information.

This research has been approved by Institutional Review Board of American University of Beirut.

If you have any questions about your rights as a research participant, you may contact IRB, AUB:

+961 1 374374, ext: 5445

If you have any questions about the conduct of the study and the results, you may contact principal investigator **Nadiya Slobodenyuk**.

Nadiya Slobodenyuk: ns74@aub.edu.lb
                                  Tel: 76674558
                                  01-350000   ext: 4366

_____   _____

Signature of Research Director   Signature of Research Participant

 Today's Date _____Time_____

INSTITUTIONAL REVIEW BOARD APPROVAL STAMP:

Appendix F. Introduction to Survey

Welcome!

Thank you for taking the time to participate in the following study.

Before you begin the survey, you will be presented with an information sheet that will provide information regarding your full rights as a participant in this research study. Once you have read, and understood the consent form carefully, you will proceed to the survey. In the survey, you will be asked to rate the arousal level of 48 words. Upon completion, you will be asked to complete a short language proficiency questionnaire.

Your time and effort are highly appreciated! Thank you!

Appendix G. Consent to Serve as a Participant in a Research Project

Principal investigator: Dr. Nadiya Slobodenyuk
Assistant Professor of Psychology,
Department of Psychology
American University of Beirut
ns74@aub.edu.lb
tel: 76674558

Nature of the Project:
You are being asked to serve as research participant in a project conducted by the Department of Psychology at AUB. The purpose of this study is to explore the relationship between emotionality of words, perception and linguistics proficiency. To participate, you must be at least 18 years old, of a Lebanese origin, have resided in Lebanon for the past 5 years, and consider Arabic as your first language and English as your second language.

Explanation of Procedures:
As a research participant you will be asked to complete a simple rating task. For this task you will view a series of sequential words on a screen, and then rate the arousal level of the displayed words on a 5 – point Likert scale. You will be also asked to fill in a short questionnaire about first and second language proficiency. Your participation in this research should take no more than 60 minutes.

Potential Discomfort and Risks:
The research involves no more than minimal risk, and is not expected to produce any discomfort. You are also free to terminate your participation at any time without any explanation.

Confidentiality:
Data obtained in this study will be encoded and kept **confidential.** You are not required to provide your name, and no identifiable information will be linked to the data you provide. Only information that cannot be traced to you will be used in research reports, and only generalized data from an expected group of 76 participants will be published. Your participation is entirely **anonymous.** Principal investigator and co-investigator are the only people who will have access to raw data.

Potential Benefits:
There are no monetary rewards for participation in this study. By participating you will help psychologists understand some aspects of emotional perceptions. You will also learn about current practices of psychological research. Additionally, you will receive a research credit for PSYC-201 course. The refusal to participate or termination of the participation will not result in the loss of benefits and will not affect your relationship with the primary investigator or the department in any way.

Alternatives to participation:
If you decide not to participate in this study but still want to earn a research credit for PSYC-201 course, you can do that by writing a brief report. If you decide to write a report, please contact PSYC 201 coordinator Dr. May Awaida (mawaida@aub.edu.lb) who will provide you with an empirical article from the Journal of Psychological Sciences. You will obtain the same credit point for either participation in this study or written report.

Withdrawal from the Project:
Your participation in this study is **completely voluntary**. You may choose not to answer some questions in surveys, and you may withdraw from the study at any time without giving any reasons. Termination of the participation will not result in the loss of any benefits to which you are entitled.

Who to Call if You Have Any Questions:
You will be receiving a copy of this consent form with all the necessary contact information.

This research has been approved by Institutional Review Board of American University of Beirut.

If you have any questions about your rights as a research participant, you may contact IRB, AUB:

+961 1 374374, ext: 5445

If you have any questions about the conduct of the study and the results, you may contact principal investigator **Nadiya Slobodenyuk**.

Nadiya Slobodenyuk: ns74@aub.edu.lb
                        Tel: 76674558
                        01-350000 ext: 4366

Approved by the Institutional Review Board on May 20, 2014

Appendix H. Consent to Serve as a Participant in a Research Project

Project title: The recall of culture - specific emotionally charged words by Arabic/English bilingual students

Principal investigator: Dr. Nadiya Slobodenyuk
Assistant Professor of Psychology,
Department of Psychology
American University of Beirut
ns74@aub.edu.lb
tel: 76674558

Nature of the Project:

Thank you for participating in the present study. The unexpected free recall test you completed at the end of the experiment was not described in the information sheet you obtained at the beginning of the study. Withholding this information was necessary because the true objective of this study was to examine whether the participants will automatically process emotionally charged words, and whether they will remember a greater number of these words in comparison to their neutral counterparts without intentional memorization. This is known as the emotionality effect. We also sought to examine whether neutral words pertaining to Lebanon's socio – political context could evoke an emotional reaction in Lebanese individuals, and, thus, produce similar emotion – memory effects as universal emotionally charged words. Due to your participation, the present study can unravel valuable information on the emotionality effect in Arabic/English bilinguals, and can investigate the effect of culture – specific emotionally charged words on memory. **You are now being asked to sign this consent form to allow us to use your data obtained in the experiment in the future analysis.**

Confidentiality:
Data obtained in this study will be encoded and kept **confidential.** You are not required to provide your name, and no identifiable information will be linked to the data you provided. Only information that cannot be traced to you will be used in research reports, and only generalized data from an expected group of 73 participants will be published. Your participation is entirely **anonymous.** Principal investigator and co-investigator are the only people who will have access to raw data.

Potential Benefits:
There are no monetary rewards for participation in this study. By allowing us to use your data you will help psychologists understand some aspects of emotional perceptions. You will also learn about current practices of psychological research. Additionally, you will receive a

research credit for PSYC-201 course. If you refuse to consent to use your data, you will still obtain PSYC-201 course credit. The decision not to sign the consent will not result in the loss of benefits and will not affect your relationship with the primary investigator or the department in any way.

Withdrawal of your data from the Project:
Your participation in this study is **completely voluntary**. You may decide to withdraw your data from the study without giving any reasons. If you decide to do so, you will still obtain credit for PSYC-201 course. Withdrawal of your data will not result in the loss of any benefits to which you are entitled.

Who to Call if You Have Any Questions:
You will be receiving a copy of this consent form with all the necessary contact information.

This research has been approved by Institutional Review Board of American University of Beirut.

If you have any questions about your rights as a research participant, you may contact IRB, AUB:

+961 1 374374, ext: 5445

If you have any questions about the conduct of the study and the results, you may contact principal investigator **Nadiya Slobodenyuk**.

Nadiya Slobodenyuk: ns74@aub.edu.lb
                    Tel: 76674558
                    01-350000   ext: 4366

Approved by the Institutional Review Board on May 20, 2014

Assumption I. Assumptions of Normality and Homogeneity of variance for L1 and L2

Table I1. Assumption of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Recall of Arabic culture - specific words	.12	76.00	.01	.93	76.00	.00
Recall of Arabic emotionally charged words	.17	76.00	.00	.91	76.00	.00
Recall of Arabic neutral words	.23	76.00	.00	.85	76.00	.00
Recall of English culture - specific words	.19	76.00	.00	.90	76.00	.00
Recall of English emotionally charged words	.14	76.00	.00	.95	76.00	.00
Recall of English neutral words	.17	76.00	.00	.92	76.00	.00
L2 proficiency	.11	76.00	.02	.93	76.00	.00
L2 acquisition	.53	76.00	.00	.09	76.00	.00

a. Lilliefors Significance Correction

Table I2. Assumption of Homogeneity of Variance

	Levene Statistic	df1	df2	Sig.
Recall of Arabic culture - specific words	.05	1.00	74.00	.83
Recall of Arabic Emotionally charged words	.63	1.00	74.00	.43
Recall of Arabic neutral words	.24	1.00	74.00	.62
Recall of English culture - specific words	1.72	1.00	74.00	.19
Recall of English emotionally charged words	.03	1.00	74.00	.86
Recall of English neutral words	3.08	1.00	74.00	.08

Table I3. Anova Table for Assumption of Homogeneity of Variance

		Sum of Squares	df	Mean Square	F	Sig.
Recall of Arabic culture - specific words	Between Groups	.69	1.00	.69	.20	.66
	Within Groups	260.99	74.00	3.53		
	Total	261.68	75.00			
Recall of Arabic emotionally charged words	Between Groups	6.50	1.00	6.50	2.95	.09
	Within Groups	162.66	74.00	2.20		

	Total	169.16	75.00			
Recall of Arabic neutral words	Between Groups	.08	1.00	.08	.06	.81
	Within Groups	112.65	74.00	1.52		
	Total	112.74	75.00			
Recall of English culture - specific words	Between Groups	.30	1.00	.30	.11	.75
	Within Groups	207.64	74.00	2.81		
	Total	207.93	75.00			
Recall of English emotionally charged words	Between Groups	2.26	1.00	2.26	.98	.33
	Within Groups	170.53	74.00	2.30		
	Total	172.79	75.00			
Recall of English neutral words	Between Groups	.29	1.00	.29	.18	.68
	Within Groups	123.12	74.00	1.66		
	Total	123.41	75.00			

Appendix J. Descriptives

Table J. Means and Standard Deviations of the Independent Variables, the Dependent Variable and the Covariates

	Mean	Std. Deviation
Arabic culture – specific words	3.22	.69
Arabic emotionally charged words	3.95	.59
Arabic neutral words	1.51	.48
English culture – specific words	3.11	.63
English emotionally charged words	3.97	.50
English neutral words	1.49	.38
Total Recall of words	12.05	5.16
Recall of Arabic culture - specific words	2.37	1.87
Recall of Arabic emotionally charged words	1.89	1.50
Recall of Arabic neutral words	1.26	1.23

Recall of English culture - specific words	2.12	1.67
Recall of English emotionally charge words	2.55	1.52
Recall of English neutral words	1.86	1.28
L2 proficiency	6.19	.63
L2 acquisition	1.01	.11

Appendix K. Correlations Matrix Table

Table K. Correlation Matrix of the Independent Variables and the Dependent Variable

	Arabic culture - specific words	Arabic emotionally charged words	Arabic neutral words	English culture - specific words	English emotionally charged words	English neutral words	Recall of Arabic culture - specific words	Recall of Arabic emotionally charged words	Recall of Arabic neutral words	Recall of English culture - specific words	Recall of English emotionally charged words	Recall of English neutral words
Arabic culture – specific words	1.00											
Arabic emotionally charged words	.08	1.00										
Arabic neutral words	.06	.19	1.00									
English culture - specific words	.49**	.33**	.11	1.00								
English emotionally charged words	-.12	.27*	.06	.15	1.00							
English neutral words	-.02	.17	.52*	.08	.32**	1.00						

Recall of Arabic culture - specific words	.14	.06	.04	.07	.06	.08	1.00				
Recall of Arabic emotionally charged words	-.13	.06	-.04	-.27*	-.17	-.01	.32**	1.00			
Recall of Arabic neutral words	.05	.07	-.04	.02	-.04	.08	.49**	.44**	1.00		
Recall of English culture - specific words	.09	.05	.09	.19	-.09	.02	-.03	.15	.08	1.00	
Recall of English emotionally charged words	-.14	.00	-.08	-.02	.26*	.14	.03	.09	.19	.03	1.00
Recall of English neutral words	.25*	.03	.14	.21	.10	.35**	.41**	.10	.26*	.15	.23*	1.00

**.Correlation is significant at the 0.01 level (2-tailed).
*.Correlation is significant at the 0.05 level (2-tailed).

Appendix L. Factorial ANOVA for L1 (Arabic Language of Presentation)

Table L1. Descriptives Table for Factorial Anova in L1

	Mean	Std. Deviation	N
Recall of Arabic culture - specific words	2.37	1.87	76.00
Recall of Arabic emotionally charged words	1.89	1.50	76.00
Recall of Arabic neutral words	1.26	1.23	76.00

Table L2. Multivariates Tests Table for Factorial Anova in L1

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
L1A	Pillai's Trace	.35	20.21[b]	2.00	74.00	.00	.35
	Wilks' Lambda	.65	20.21[b]	2.00	74.00	.00	.35
	Hotelling's Trace	.55	20.21[b]	2.00	74.00	.00	.35
	Roy's Largest Root	.55	20.21[b]	2.00	74.00	.00	.35

Table L3. Mauchly's Test of Sphericity Table for Factorial Anova in L1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
L1A	.87	10.01	2.00	.01	.89	.91	.50

Table L4. Test of Within – Subjects Effects Table for Factorial Anova in L1

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
L1A	Sphericity Assumed	46.74	2.00	23.37	15.89	.00	.18
	Greenhouse-Geisser	46.74	1.78	26.33	15.89	.00	.18
	Huynh-Feldt	46.74	1.82	25.75	15.89	.00	.18
	Lower-bound	46.74	1.00	46.74	15.89	.00	.18
Error(L1A)	Sphericity Assumed	220.60	150.00	1.47			
	Greenhouse-Geisser	220.60	133.15	1.66			
	Huynh-Feldt	220.60	136.15	1.62			
	Lower-bound	220.60	75.00	2.94			

Table L5. Pairwise Comparisons Table for Factorial Anova in L1

(I) L1A	(J) L1A	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.47	.23	.12	-.08	1.03
	3	1.11[*]	.19	.00	.64	1.57
2	1	-.47	.23	.12	-1.03	.08
	3	.63[*]	.17	.00	.22	1.04
3	1	-1.11[*]	.19	.00	-1.57	-.64
	2	-.63[*]	.17	.00	-1.04	-.22

Based on estimated marginal means

*. The mean difference is significant at the

b. Adjustment for multiple comparisons: Bonferroni.

Appendix M. Factorial ANOVA for L2 (English Language of Presentation)

Table M1. Descriptives Table for Factorial Anova in L2

	Mean	Std. Deviation	N
Recall of English culture - specific words	2.12	1.67	76.00
Recall of English emotionally charged words	2.55	1.52	76.00
Recall of English neutral words	1.86	1.28	76.00

Table M2. Multivariate Tests Table for Factorial Anova in L2

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
L2E	Pillai's Trace	.14	5.97[b]	2.00	74.00	.00	.14
	Wilks' Lambda	.86	5.97[b]	2.00	74.00	.00	.14
	Hotelling's Trace	.16	5.97[b]	2.00	74.00	.00	.14
	Roy's Largest Root	.16	5.97[b]	2.00	74.00	.00	.14

Table M3. Mauchly's Test of Sphericity Table for Factorial Anova in L2

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound

L2E	.92	5.92	2.00	.05	.93	.95	.50

Table M4. Test of Within – Subjects Effects Table for Factorial Anova in L2

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
L2E	Sphericity Assumed	18.85	2.00	9.43	4.79	.01	.06
	Greenhouse-Geisser	18.85	1.86	10.15	4.79	.01	.06
	Huynh-Feldt	18.85	1.90	9.91	4.79	.01	.06
	Lower-bound	18.85	1.00	18.85	4.79	.03	.06
Error(L2E)	Sphericity Assumed	295.15	150.00	1.97			
	Greenhouse-Geisser	295.15	139.29	2.12			
	Huynh-Feldt	295.15	142.68	2.07			
	Lower-bound	295.15	75.00	3.94			

Table M5. Pairwise Comparisons Table for Factorial Anova in L2

(I) L2E	(J) L2E	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	-.43	.26	.28	-1.06	.19
	3	.26	.22	.73	-.28	.81
2	1	.43	.26	.28	-.19	1.06
	3	.70[*]	.20	.00	.21	1.19
3	1	-.26	.22	.73	-.81	.28
	2	-.70[*]	.20	.00	-1.19	-.21

Based on estimated marginal means

*. The mean difference is significant at the

b. Adjustment for multiple comparisons: Bonferroni.

Appendix N. Factorial ANCOVA for L1 and L2

Table N1. Descriptives Table for Factorial ANCOVA in L1

	Mean	Std. Deviation	N
Recall of Arabic culture - specific words	2.37	1.87	76.00
Recall of Arabic emotionally charged words	1.89	1.50	76.00
Recall of Arabic neutral words	1.26	1.23	76.00

Table N2. Multivariate Tests Table for Factorial ANCOVA in L2

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
L1A	Pillai's Trace	.01	.19[b]	2.00	73.00	.83	.01
	Wilks' Lambda	.99	.19[b]	2.00	73.00	.83	.01
	Hotelling's Trace	.01	.19[b]	2.00	73.00	.83	.01
	Roy's Largest Root	.01	.19[b]	2.00	73.00	.83	.01
L1A * L2profiency	Pillai's Trace	.00	.01[b]	2.00	73.00	.99	.00
	Wilks' Lambda	1.00	.01[b]	2.00	73.00	.99	.00
	Hotelling's Trace	.00	.01[b]	2.00	73.00	.99	.00
	Roy's Largest Root	.00	.01[b]	2.00	73.00	.99	.00

a. Design: Intercept + L2profiency
Within Subjects Design: L1A
b. Exact statistic

Table N3. Mauchly's Test of Sphericity Table for Factorial ANCOVA in L1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
L1A	.87	9.88	2.00	.01	.89	.92	.50

Table N4. Tests of Within-Subjects Effects Table for Factorial ANCOVA in L1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
L1A	Sphericity Assumed	.54	2.00	.27	.18	.83	.00
	Greenhouse-Geisser	.54	1.78	.30	.18	.81	.00
	Huynh-Feldt	.54	1.84	.29	.18	.82	.00
	Lower-bound	.54	1.00	.54	.18	.67	.00
L1A * L2profiency	Sphericity Assumed	.04	2.00	.02	.01	.99	.00
	Greenhouse-Geisser	.04	1.78	.02	.01	.98	.00
	Huynh-Feldt	.04	1.84	.02	.01	.98	.00
	Lower-bound	.04	1.00	.04	.01	.90	.00
Error(L1A)	Sphericity Assumed	220.55	148.00	1.49			
	Greenhouse-Geisser	220.55	131.38	1.68			
	Huynh-Feldt	220.55	136.20	1.62			
	Lower-bound	220.55	74.00	2.98			

Table N5. Estimates Table for Factorial ANCOVA in L1

L1A	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1.00	2.37[a]	.21	1.94	2.79
2.00	1.89[a]	.17	1.55	2.24
3.00	1.26[a]	.14	.99	1.54

a. Covariates appearing in the model are evaluated at the following values: L2 proficiency = 6.1875.

Table N6. Pairwise Comparisons Table for Factorial ANCOVA in L1

(I) L1A	(J) L1A	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1.00	2.00	.47	.23	.13	-.09	1.03
	3.00	1.11[*]	.19	.00	.64	1.57
2.00	1.00	-.47	.23	.13	-1.03	.09
	3.00	.63[*]	.17	.00	.22	1.05
3.00	1.00	-1.11[*]	.19	.00	-1.57	-.64
	2.00	-.63[*]	.17	.00	-1.05	-.22

Based on estimated marginal means

*. The mean difference is significant at the

b. Adjustment for multiple comparisons: Bonferroni.

Figure N1. The Mean Recall of Culture – Specific Emotionally Charged Words, Emotionally Charged words, and Neutral Words in L1, While Controlling for the Level of L2 Proficiency

Table N7. Descriptives Table for Factorial ANCOVA in L2

	Mean	Std. Deviation	N
Recall of English culture - specific words	2.12	1.67	76.00
Recall of English emotionally charged words	2.55	1.52	76.00
Recall of English neutral words	1.86	1.28	76.00

Table N8. Multivariate Tests Table for Factorial ANCOVA in L2

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
L2E	Pillai's Trace	.01	.33[b]	2.00	73.00	.72	.01
	Wilks' Lambda	.99	.33[b]	2.00	73.00	.72	.01
	Hotelling's Trace	.01	.33[b]	2.00	73.00	.72	.01
	Roy's Largest Root	.01	.33[b]	2.00	73.00	.72	.01
L2E * L2profiency	Pillai's Trace	.02	.58[b]	2.00	73.00	.56	.02
	Wilks' Lambda	.98	.58[b]	2.00	73.00	.56	.02
	Hotelling's Trace	.02	.58[b]	2.00	73.00	.56	.02
	Roy's Largest Root	.02	.58[b]	2.00	73.00	.56	.02

Table N9. Mauchly's Test of Sphericity for Factorial ANCOVA in L2

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
L2E	.92	5.73	2.00	.06	.93	.97	.50

Table N10. Tests of Within-Subjects Effects Table for Factorial ANCOVA in L2

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
L2E	Sphericity Assumed	1.57	2.00	.79	.40	.67	.01
	Greenhouse-Geisser	1.57	1.86	.84	.40	.66	.01
	Huynh-Feldt	1.57	1.93	.81	.40	.67	.01
	Lower-bound	1.57	1.00	1.57	.40	.53	.01
L2E * L2profiency	Sphericity Assumed	2.52	2.00	1.26	.64	.53	.01
	Greenhouse-Geisser	2.52	1.86	1.36	.64	.52	.01
	Huynh-Feldt	2.52	1.93	1.31	.64	.52	.01
	Lower-bound	2.52	1.00	2.52	.64	.43	.01
Error(L2E)	Sphericity Assumed	292.63	148.00	1.98			
	Greenhouse-Geisser	292.63	137.61	2.13			
	Huynh-Feldt	292.63	142.92	2.05			
	Lower-bound	292.63	74.00	3.95			

Table N11. Estimates Table for Factorial ANCOVA in L2

L2E	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1.00	2.12[a]	.19	1.74	2.50
2.00	2.55[a]	.17	2.21	2.90
3.00	1.86[a]	.15	1.56	2.15

a. Covariates appearing in the model are evaluated at the following values: L2 proficiency = 6.1875.

Table N12. Pairwise Comparisons Table for Factorial ANCOVA in L2

(I) L2E	(J) L2E	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1.00	2.00	-.43	.26	.28	-1.06	.19
	3.00	.26	.22	.74	-.29	.81
2.00	1.00	.43	.26	.28	-.19	1.06
	3.00	.70[*]	.20	.00	.20	1.19
3.00	1.00	-.26	.22	.74	-.81	.29
	2.00	-.70[*]	.20	.00	-1.19	-.20

Based on estimated marginal means

*. The mean difference is significant at the

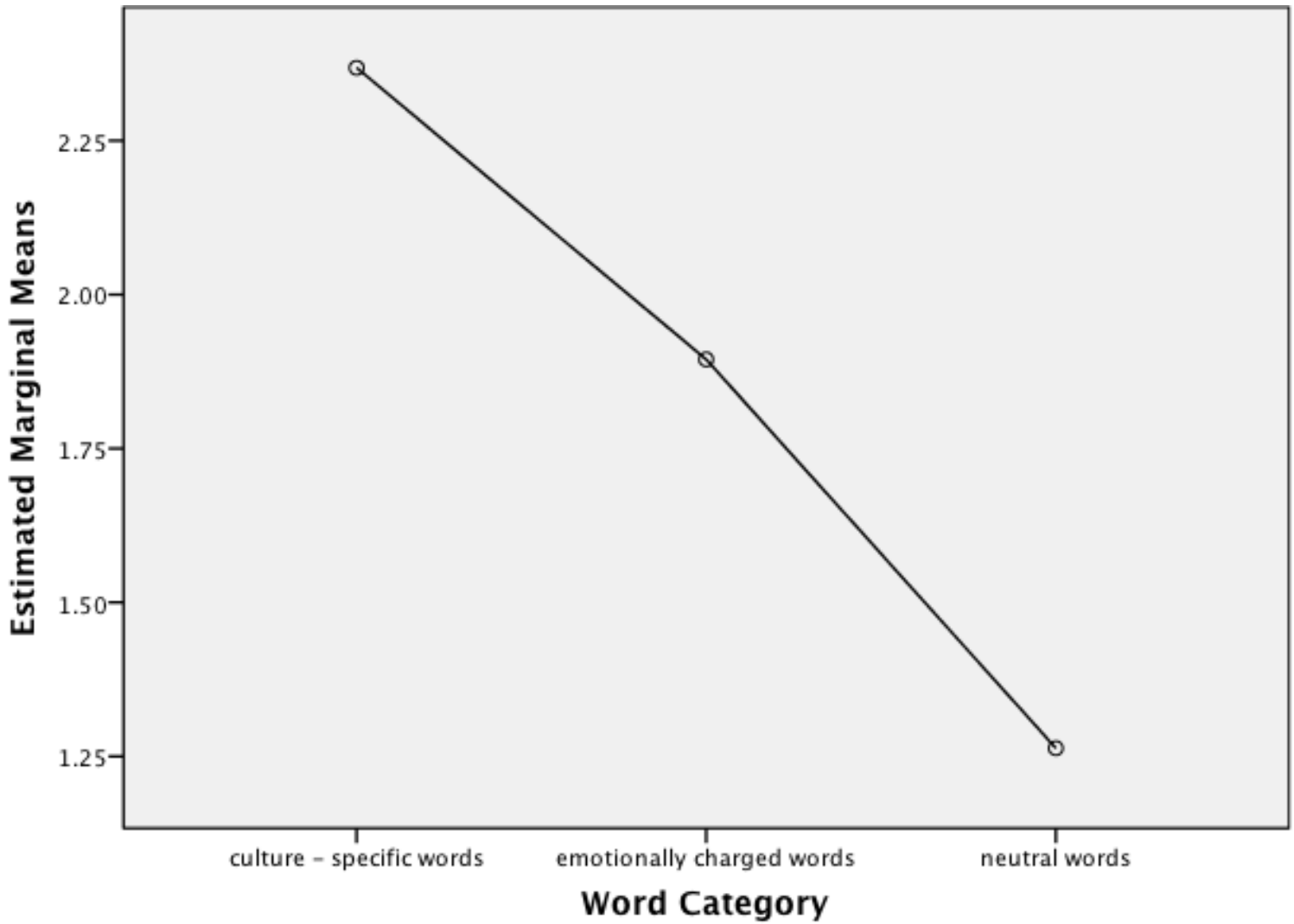b. Adjustment for multiple comparisons: Bonferroni.
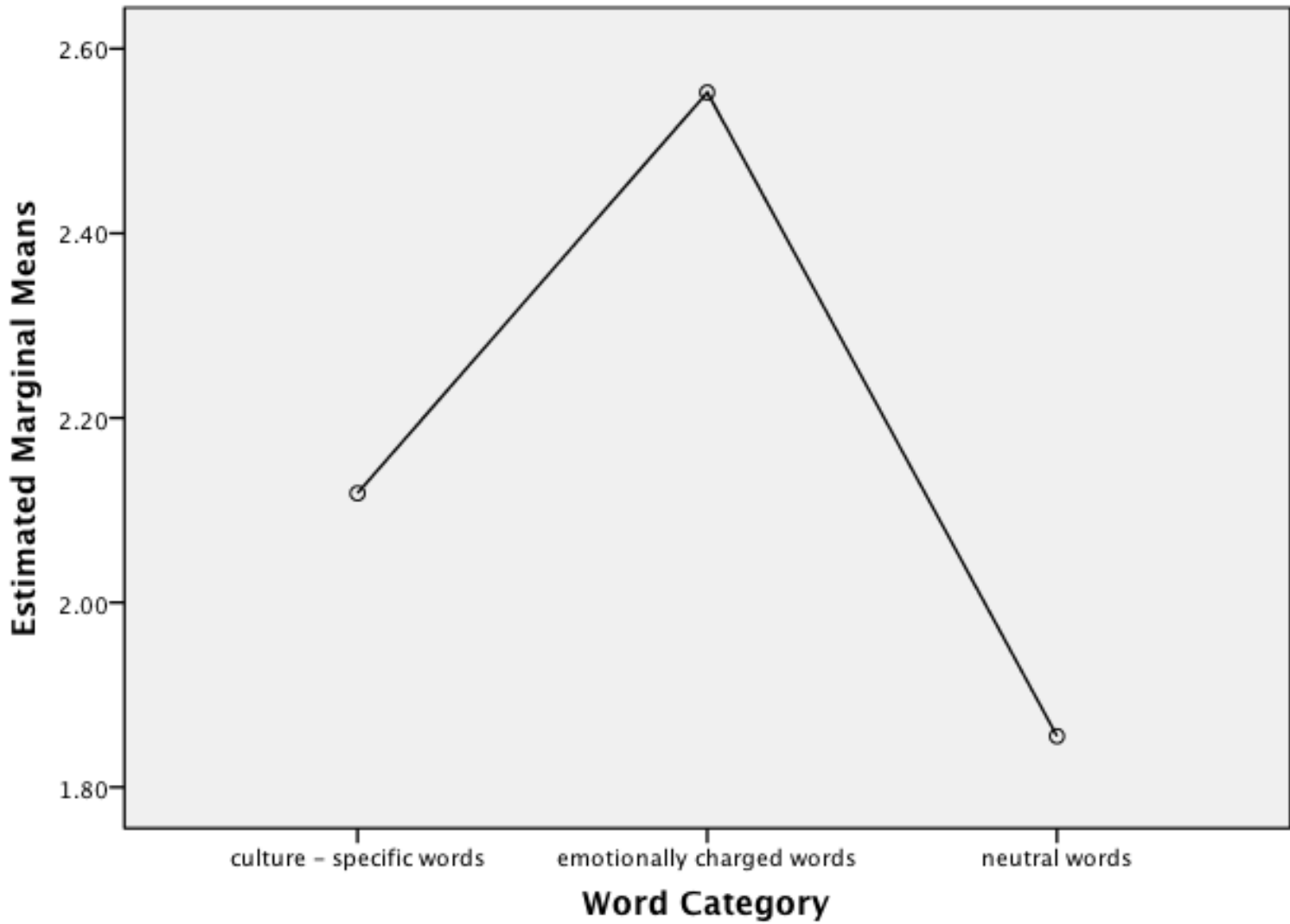
Figure N2. The Mean Recall of Culture – Specific Emotionally Charged Words, Emotionally Charged words, and Neutral Words in L2, While Controlling for the Level of L2 Proficiency

Appendix O. ANCOVA with Language Proficiency Sub- Factors

Table O1. Mauchly's Test of Sphericity Table for Factorial ANCOVA in L1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
L1A	.86	9.74	2.00	.01	.88	1.00	.50

Table O2. Multivariate Test Table for Factorial ANCOVA in L1

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
L1A	Pillai's Trace	.04	1.32[b]	2.00	65.00	.27	.04
	Wilks' Lambda	.96	1.32[b]	2.00	65.00	.27	.04
	Hotelling's Trace	.04	1.32[b]	2.00	65.00	.27	.04
	Roy's Largest Root	.04	1.32[b]	2.00	65.00	.27	.04
L1A * L1Use	Pillai's Trace	.00	.04[b]	2.00	65.00	.96	.00
	Wilks' Lambda	1.00	.04[b]	2.00	65.00	.96	.00
	Hotelling's Trace	.00	.04[b]	2.00	65.00	.96	.00
	Roy's Largest Root	.00	.04[b]	2.00	65.00	.96	.00
L1A * L2Use	Pillai's Trace	.03	.86[b]	2.00	65.00	.43	.03
	Wilks' Lambda	.97	.86[b]	2.00	65.00	.43	.03
	Hotelling's Trace	.03	.86[b]	2.00	65.00	.43	.03
	Roy's Largest Root	.03	.86[b]	2.00	65.00	.43	.03
L1A * CountL	Pillai's Trace	.05	1.57[b]	2.00	65.00	.22	.05
	Wilks' Lambda	.95	1.57[b]	2.00	65.00	.22	.05
	Hotelling's Trace	.05	1.57[b]	2.00	65.00	.22	.05

	Roy's Largest Root	.05	1.57[b]	2.00	65.00	.22	.05
	Pillai's Trace	.02	.79[b]	2.00	65.00	.46	.02
	Wilks' Lambda	.98	.79[b]	2.00	65.00	.46	.02
L1A * DreamL	Hotelling's Trace	.02	.79[b]	2.00	65.00	.46	.02
	Roy's Largest Root	.02	.79[b]	2.00	65.00	.46	.02
	Pillai's Trace	.12	4.57[b]	2.00	65.00	.01	.12
L1A * EmotionL	Wilks' Lambda	.88	4.57[b]	2.00	65.00	.01	.12
	Hotelling's Trace	.14	4.57[b]	2.00	65.00	.01	.12
	Roy's Largest Root	.14	4.57[b]	2.00	65.00	.01	.12
	Pillai's Trace	.00	.08[b]	2.00	65.00	.92	.00
	Wilks' Lambda	1.00	.08[b]	2.00	65.00	.92	.00
L1A * LPhome	Hotelling's Trace	.00	.08[b]	2.00	65.00	.92	.00
	Roy's Largest Root	.00	.08[b]	2.00	65.00	.92	.00
	Pillai's Trace	.06	2.12[b]	2.00	65.00	.13	.06
	Wilks' Lambda	.94	2.12[b]	2.00	65.00	.13	.06
L1A * LPwork	Hotelling's Trace	.07	2.12[b]	2.00	65.00	.13	.06
	Roy's Largest Root	.07	2.12[b]	2.00	65.00	.13	.06
	Pillai's Trace	.06	1.90[b]	2.00	65.00	.16	.06
	Wilks' Lambda	.94	1.90[b]	2.00	65.00	.16	.06
L1A * LPparty	Hotelling's Trace	.06	1.90[b]	2.00	65.00	.16	.06
	Roy's Largest Root	.06	1.90[b]	2.00	65.00	.16	.06
	Pillai's Trace	.01	.28[b]	2.00	65.00	.75	.01
L1A * LPgeneral	Wilks' Lambda	.99	.28[b]	2.00	65.00	.75	.01
	Hotelling's Trace	.01	.28[b]	2.00	65.00	.75	.01
	Roy's Largest Root	.01	.28[b]	2.00	65.00	.75	.01

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Table O3. Tests of Within- Subjects Effects Table For Factorial ANCOVA in L1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
L1A	Sphericity Assumed	5.15	2.00	2.58	1.84	.16	.03
	Greenhouse-Geisser	5.15	1.76	2.93	1.84	.17	.03
	Huynh-Feldt	5.15	2.00	2.58	1.84	.16	.03
	Lower-bound	5.15	1.00	5.15	1.84	.18	.03
L1A * L1Use	Sphericity Assumed	.08	2.00	.04	.03	.97	.00
	Greenhouse-Geisser	.08	1.76	.05	.03	.96	.00
	Huynh-Feldt	.08	2.00	.04	.03	.97	.00
	Lower-bound	.08	1.00	.08	.03	.87	.00
L1A * L2Use	Sphericity Assumed	1.61	2.00	.81	.58	.56	.01
	Greenhouse-Geisser	1.61	1.76	.92	.58	.54	.01
	Huynh-Feldt	1.61	2.00	.81	.58	.56	.01
	Lower-bound	1.61	1.00	1.61	.58	.45	.01
L1A * CountL	Sphericity Assumed	3.26	2.00	1.63	1.17	.31	.02
	Greenhouse-Geisser	3.26	1.76	1.86	1.17	.31	.02
	Huynh-Feldt	3.26	2.00	1.63	1.17	.31	.02
	Lower-bound	3.26	1.00	3.26	1.17	.28	.02
L1A * DreamL	Sphericity Assumed	1.47	2.00	.74	.53	.59	.01
	Greenhouse-Geisser	1.47	1.76	.84	.53	.57	.01
	Huynh-Feldt	1.47	2.00	.74	.53	.59	.01
	Lower-bound	1.47	1.00	1.47	.53	.47	.01
L1A * EmotionL	Sphericity Assumed	10.18	2.00	5.09	3.64	.03	.05

	Greenhouse-Geisser	10.18	1.76	5.80	3.64	.03	.05
	Huynh-Feldt	10.18	2.00	5.09	3.64	.03	.05
	Lower-bound	10.18	1.00	10.18	3.64	.06	.05
	Sphericity Assumed	.16	2.00	.08	.06	.94	.00
L1A * LPhome	Greenhouse-Geisser	.16	1.76	.09	.06	.93	.00
	Huynh-Feldt	.16	2.00	.08	.06	.94	.00
	Lower-bound	.16	1.00	.16	.06	.81	.00
	Sphericity Assumed	7.44	2.00	3.72	2.66	.07	.04
L1A * LPwork	Greenhouse-Geisser	7.44	1.76	4.24	2.66	.08	.04
	Huynh-Feldt	7.44	2.00	3.72	2.66	.07	.04
	Lower-bound	7.44	1.00	7.44	2.66	.11	.04
	Sphericity Assumed	4.97	2.00	2.48	1.78	.17	.03
L1A * LPparty	Greenhouse-Geisser	4.97	1.76	2.83	1.78	.18	.03
	Huynh-Feldt	4.97	2.00	2.48	1.78	.17	.03
	Lower-bound	4.97	1.00	4.97	1.78	.19	.03
	Sphericity Assumed	.92	2.00	.46	.33	.72	.00
L1A * LPgeneral	Greenhouse-Geisser	.92	1.76	.53	.33	.69	.00
	Huynh-Feldt	.92	2.00	.46	.33	.72	.00
	Lower-bound	.92	1.00	.92	.33	.57	.00
	Sphericity Assumed	184.47	132.00	1.40			
Error(L1A)	Greenhouse-Geisser	184.47	115.87	1.59			
	Huynh-Feldt	184.47	132.00	1.40			
	Lower-bound	184.47	66.00	2.79			

Table O4. Tests of Between – Subjects Effect Table for Factorial ANCOVA in L1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	5.85	1.00	5.85	4.24	.04	.06
L1Use	1.45	1.00	1.45	1.05	.31	.02
L2Use	3.42	1.00	3.42	2.48	.12	.04
CountL	.78	1.00	.78	.57	.45	.01
DreamL	.75	1.00	.75	.55	.46	.01
EmotionL	.84	1.00	.84	.61	.44	.01
LPhome	1.25	1.00	1.25	.91	.34	.01
LPwork	4.69	1.00	4.69	3.40	.07	.05
LPparty	.75	1.00	.75	.54	.46	.01
LPgeneral	6.01	1.00	6.01	4.36	.04	.06
Error	91.10	66.00	1.38			

Table O5. Pairwise Comparisons Table for Factorial ANCOVA in L1

(I) L1A	(J) L1A	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1.00	2.00	.47	.22	.11	-.07	1.02
	3.00	1.11[*]	.19	.00	.64	1.57
2.00	1.00	-.47	.22	.11	-1.02	.07
	3.00	.63[*]	.16	.00	.24	1.02
3.00	1.00	-1.11[*]	.19	.00	-1.57	-.64
	2.00	-.63[*]	.16	.00	-1.02	-.24

Based on estimated marginal means

*. The mean difference is significant at the

b. Adjustment for multiple comparisons: Bonferroni.

Table O6. Multivariate Tests Table for Factorial ANCOVA in L2

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
L2E	Pillai's Trace	.00	.06[b]	2.00	65.00	.95	.00
	Wilks' Lambda	1.00	.06[b]	2.00	65.00	.95	.00
	Hotelling's Trace	.00	.06[b]	2.00	65.00	.95	.00
	Roy's Largest Root	.00	.06[b]	2.00	65.00	.95	.00
L2E * L1Use	Pillai's Trace	.00	.12[b]	2.00	65.00	.89	.00
	Wilks' Lambda	1.00	.12[b]	2.00	65.00	.89	.00
	Hotelling's Trace	.00	.12[b]	2.00	65.00	.89	.00
	Roy's Largest Root	.00	.12[b]	2.00	65.00	.89	.00
L2E * L2Use	Pillai's Trace	.05	1.73[b]	2.00	65.00	.19	.05
	Wilks' Lambda	.95	1.73[b]	2.00	65.00	.19	.05
	Hotelling's Trace	.05	1.73[b]	2.00	65.00	.19	.05
	Roy's Largest Root	.05	1.73[b]	2.00	65.00	.19	.05
L2E * CountL	Pillai's Trace	.01	.30[b]	2.00	65.00	.74	.01
	Wilks' Lambda	.99	.30[b]	2.00	65.00	.74	.01
	Hotelling's Trace	.01	.30[b]	2.00	65.00	.74	.01
	Roy's Largest Root	.01	.30[b]	2.00	65.00	.74	.01
L2E * DreamL	Pillai's Trace	.00	.15[b]	2.00	65.00	.86	.00
	Wilks' Lambda	1.00	.15[b]	2.00	65.00	.86	.00
	Hotelling's Trace	.00	.15[b]	2.00	65.00	.86	.00
	Roy's Largest Root	.00	.15[b]	2.00	65.00	.86	.00
L2E * EmotionL	Pillai's Trace	.02	.83[b]	2.00	65.00	.44	.02
	Wilks' Lambda	.98	.83[b]	2.00	65.00	.44	.02

	Hotelling's Trace	.03	.83[b]	2.00	65.00	.44	.02
	Roy's Largest Root	.03	.83[b]	2.00	65.00	.44	.02
	Pillai's Trace	.00	.12[b]	2.00	65.00	.88	.00
	Wilks' Lambda	1.00	.12[b]	2.00	65.00	.88	.00
L2E * LPhome	Hotelling's Trace	.00	.12[b]	2.00	65.00	.88	.00
	Roy's Largest Root	.00	.12[b]	2.00	65.00	.88	.00
	Pillai's Trace	.02	.53[b]	2.00	65.00	.59	.02
	Wilks' Lambda	.98	.53[b]	2.00	65.00	.59	.02
L2E * LPwork	Hotelling's Trace	.02	.53[b]	2.00	65.00	.59	.02
	Roy's Largest Root	.02	.53[b]	2.00	65.00	.59	.02
	Pillai's Trace	.09	3.19[b]	2.00	65.00	.05	.09
	Wilks' Lambda	.91	3.19[b]	2.00	65.00	.05	.09
L2E * LPparty	Hotelling's Trace	.10	3.19[b]	2.00	65.00	.05	.09
	Roy's Largest Root	.10	3.19[b]	2.00	65.00	.05	.09
	Pillai's Trace	.02	.70[b]	2.00	65.00	.50	.02
	Wilks' Lambda	.98	.70[b]	2.00	65.00	.50	.02
L2E * LPgeneral	Hotelling's Trace	.02	.70[b]	2.00	65.00	.50	.02
	Roy's Largest Root	.02	.70[b]	2.00	65.00	.50	.02

a. Design: Intercept + L1Use + L2Use + CountL + DreamL + EmotionL + LPhome + LPwork + LPparty + LPgeneral

 Within Subjects Design: L2E

b. Exact statistic

Table O7. Mauchly's Test of Sphericity Table for Factorial ANCOVA in L2

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
L2E	.88	8.68	2.00	.01	.89	1.00	.50

Table O8. Tests of Within-Subjects Effects Table for Factorial ANCOVA in L2

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
L2E	Sphericity Assumed	.24	2.00	.12	.06	.94	.00
	Greenhouse-Geisser	.24	1.78	.14	.06	.93	.00
	Huynh-Feldt	.24	2.00	.12	.06	.94	.00
	Lower-bound	.24	1.00	.24	.06	.81	.00
L2E * L1Use	Sphericity Assumed	.50	2.00	.25	.12	.88	.00
	Greenhouse-Geisser	.50	1.78	.28	.12	.86	.00
	Huynh-Feldt	.50	2.00	.25	.12	.88	.00
	Lower-bound	.50	1.00	.50	.12	.73	.00
L2E * L2Use	Sphericity Assumed	5.15	2.00	2.58	1.28	.28	.02
	Greenhouse-Geisser	5.15	1.78	2.90	1.28	.28	.02
	Huynh-Feldt	5.15	2.00	2.58	1.28	.28	.02
	Lower-bound	5.15	1.00	5.15	1.28	.26	.02
L2E * CountL	Sphericity Assumed	1.03	2.00	.51	.25	.78	.00
	Greenhouse-Geisser	1.03	1.78	.58	.25	.75	.00
	Huynh-Feldt	1.03	2.00	.51	.25	.78	.00

	Lower-bound	1.03	1.00	1.03	.25	.62	.00
L2E * DreamL	Sphericity Assumed	.42	2.00	.21	.10	.90	.00
	Greenhouse-Geisser	.42	1.78	.24	.10	.88	.00
	Huynh-Feldt	.42	2.00	.21	.10	.90	.00
	Lower-bound	.42	1.00	.42	.10	.75	.00
L2E * EmotionL	Sphericity Assumed	2.82	2.00	1.41	.70	.50	.01
	Greenhouse-Geisser	2.82	1.78	1.59	.70	.48	.01
	Huynh-Feldt	2.82	2.00	1.41	.70	.50	.01
	Lower-bound	2.82	1.00	2.82	.70	.41	.01
L2E * LPhome	Sphericity Assumed	.33	2.00	.17	.08	.92	.00
	Greenhouse-Geisser	.33	1.78	.19	.08	.90	.00
	Huynh-Feldt	.33	2.00	.17	.08	.92	.00
	Lower-bound	.33	1.00	.33	.08	.78	.00
L2E * LPwork	Sphericity Assumed	1.46	2.00	.73	.36	.70	.01
	Greenhouse-Geisser	1.46	1.78	.82	.36	.67	.01
	Huynh-Feldt	1.46	2.00	.73	.36	.70	.01
	Lower-bound	1.46	1.00	1.46	.36	.55	.01
L2E * LPparty	Sphericity Assumed	9.85	2.00	4.93	2.44	.09	.04
	Greenhouse-Geisser	9.85	1.78	5.54	2.44	.10	.04
	Huynh-Feldt	9.85	2.00	4.93	2.44	.09	.04
	Lower-bound	9.85	1.00	9.85	2.44	.12	.04
L2E * LPgeneral	Sphericity Assumed	3.16	2.00	1.58	.78	.46	.01
	Greenhouse-Geisser	3.16	1.78	1.78	.78	.45	.01
	Huynh-Feldt	3.16	2.00	1.58	.78	.46	.01
	Lower-bound	3.16	1.00	3.16	.78	.38	.01
Error(L2E)	Sphericity Assumed	266.68	132.00	2.02			

Greenhouse-Geisser	266.68	117.34	2.27
Huynh-Feldt	266.68	132.00	2.02
Lower-bound	266.68	66.00	4.04

Table O9. Tests of Between – Subjects Effects Table for Factorial ANCOVA in L2

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	1.88	1.00	1.88	2.07	.16	.03
L1Use	.17	1.00	.17	.19	.66	.00
L2Use	.31	1.00	.31	.34	.56	.01
CountL	.11	1.00	.11	.12	.73	.00
DreamL	.48	1.00	.48	.53	.47	.01
EmotionL	.45	1.00	.45	.49	.49	.01
LPhome	7.21	1.00	7.21	7.93	.01	.11
LPwork	.11	1.00	.11	.12	.73	.00
LPparty	.11	1.00	.11	.13	.72	.00
LPgeneral	.85	1.00	.85	.93	.34	.01
Error	59.99	66.00	.91			

Table O10. Pairwise Comparisons Table for Factorial ANCOVA in L2

(I) L2E	(J) L2E	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1.00	2.00	-.43	.26	.31	-1.08	.21
	3.00	.26	.23	.78	-.31	.83
2.00	1.00	.43	.26	.31	-.21	1.08
	3.00	.70[*]	.19	.00	.23	1.17
3.00	1.00	-.26	.23	.78	-.83	.31
	2.00	-.70[*]	.19	.00	-1.17	-.23

References

Altarriba, J., & Bauer, L. (2004). The distinctiveness of emotion concepts: A comparison between emotion, abstract, and concrete words. *American Journal of Psychology, 117*, 389 – 410. doi: 10.2307/4149007

Amir, N., Taylor, C. T., Bomyea, J. A., & Badour, C. L. (2009). Temporal allocation of attention toward threat in individuals with posttraumatic stress symptoms. *Journal of Anxiety Disorders, 23*, 1080 –1085. doi: 10.1016/j.janxdis.2009.07.010

Anooshian, J. L., & Hertel, T. P. (1994). Emotionality in free recall: Language specificity in bilingual memory. *Cognition and Emotion, 18*, 503 – 514. doi:10.1080/02699939408408956

Arnell, K. M., Killman, K., & Fijavz, D. (2007). Blinded by emotions: Target misses follow attentional capture by arousing distractors in RSVP. *Emotion, 7,* 465 – 477. doi: 10.1037/1528-3542.7.3.465

Aycicegi, A., & Harris, C. L. (2004). Bilinguals' recall and recognition of emotion words. *Cognition and Emotion, 18*, 977 – 987. doi:10.1080/02699930341000301

Ayçiçegi-Dinn, A., & Caldwell – Harris, C.L. (2009). Emotion-memory effects in bilingual speakers: a levels-of-processing approach. *Bilingualism: Language and Cognition, 12*, 291 – 303. doi: 10.1017/S1366728909990125

Bellezza, F. S., Greenwald, A. G., & Banaji, M. R. (1986). Words high and low in pleasantness as rated by male and female college students. *Behavior Research Methods, Instruments, and Computers, 18*, 299 – 303.

Bloom, L., & Capatides, J. B. (1987). Expression of affect and the emergence of language.

Child Development, 58, 1513 – 1522.

Boer, D. & Fischer, R. (2013). How and when do personal values guide our attitudes and
sociality? Explaining cross – cultural variability in attitude – value linkages.
Psychological Bulletin, *139*, 1113 – 1147. doi: 10.1037/a0031347

Bond, M., & Lai, T. M. (1986). Embarrassment and Code-switching into a Second Language.
The Journal of Social Psychology, 126, 179 – 186.

Bradley, M. M., & Lang, P. J. (1999). Affective norms for English words (ANEW): Stimuli,
instruction manual and affective ratings. In Technical Report C-1. Gainesville, FL: The
Centre for Research in Psychophysiology, University of Florida.

Christianson, S. A., & Fallman, L. 1990. The role of age on reactivity and memory for
emotional pictures. *Scandinavian Journal of Psychology, 31*, 291 – 301.
doi: 10.1111/j.1467-9450.1990.tb00841.x

 Cisler, J. M., Ries, B. J., & Widner, R. L. (2007). Examining information processing biases in
spider phobia using the rapid serial visual presentation paradigm. *Journal of Anxiety
Disorders, 21*, 977 – 990. doi: 10.1016/j.janxdis.2006.10.011

Colbeck, K.L., & Bowers, J. S. (2012). Blinded by taboo words in L1 but not in L2. *Emotion,
12,* 217 – 222. doi: 10.1037/a0026387

Craik, F. I. & Lockhart, R. S. (1972). Levels of processing: A framework for memory research.
Journal of Verbal Learning and Verbal Behavior, 11, 671 – 684. doi: 10.1016/S0022-
5371(72)80001-X

Dewaele, J. M. (2004a). The emotional force of swearwords and taboo words in the speech of
multilinguals. *Journal of Multilingual and Multicultural Development, 25*, 204 – 222.
doi**:** 10.1080/01434630408666529

Dewaele, J. M., & Pavlenko, A. (2002) Emotion vocabulary in inter – language. *Language*

    Learning, 52(2), 265 – 324. doi: 10.1111/0023-8333.00185

Diab, I. (2010). The case of Lebanon: Encourage one another to work for peace and justice.

    International Congregational Journal, 9, 65 – 78.

Eilola, T. M., Havelka, J., & Dinkar, S. (2007). Emotional activation in the first and second

    language. *Cognition and Emotion, 21*, 1064 – 1076. doi: 10.1080/02699930601054109

Ferré, P. (2003): Effects of level of processing on memory for affectively valenced words,

    Cognition & Emotion, *17*(6), 859 - 880. doi: 10.1080/02699930244000200

Ferré, P., Garcia, T., Fraga, I., Sanchez-Casus, R., & Molero, M. (2010). Memory for

    Emotional Words in Bilinguals: Do Words Have the Same Emotional Intensity in the

    First and in the Second Language? *Cognition and Emotion, 24*(5)*,* 760 – 785. doi:

    10.1017/S1366728912000314

Foa, E. B., Feske, U., Murdock, T. B., Kozak, M. J., & McCarthy, P. R. (1991).

    Processing of threat-related information in rape victims. *Journal of Abnormal*

    Psychology, 100, 156 – 162. doi: 10.1037/0021-843X.100.2.156

Gonzalez-Reigosa, F. (1976). The anxiety arousing effect of taboo words in bilinguals

    D*issertation Abstracts International, 33(7).*

 Gotlib, 1. H., & McCann, C. D. (1984). Construct accessibility and depression: An

    examination of cognitive and affective factors. *Journal of Personality and Social*

    Psychology, 47, 427 – 439. doi: 10.1080/02699938808410923

Hamman, S. (2001). Cognitive and neural mechanisms of emotional memory. *Trends in*

    Cognitive Sciences, *5*(9), 394 – 399.

Harris, C. L. (2004). Bilingual speakers in the lab: Psychophysiological measures of emotional

reactivity. *Journal of Multilingual and Multicultural Development, 25,* 223 – 247. doi:

10.1080/01434630408666530

Harris, C. L., Aycicegi, A., & Gleason, J. B. (2003). Taboo words and reprimands

elicit greater autonomic reactivity in a first than in a second language. *Applied*

Psycholinguistics, 4, 561 – 578. doi: 10.1017/S0142716403000286

Harris, C. L., Gleason, J. B., & Aycicegi, A. (2006). When is a first language more emotional?

Psychophysiological evidence from bilingual speakers. Bilingual Education And

Bilingualism, 56, 257 – 283.

Hoffmann, N. (2013). Female genital mutilation in Egypt. *Global Journal of Medicine and*

Public Health, 2, 1 – 5.

Inglehart, R. (2001). Human Beliefs and Values: A Cross-cultural Sourcebook Based on

the 1999 – 2002 system surveys. Siglo XXI.

Jay, T., Caldwell – Harris, C. L., & King, K. (2008). Recalling taboo and nontaboo words.

American Journal of Psychology, 121, 83 – 103. doi: 10.2307/20445445

Kambarami, M. (2006). Femininity, sexuality and culture: Patriarchy and female subordination

in Zimbabwe. Understanding human sexuality seminar series. ARSRC.

Kensinger, E. (2004). Remembering emotional experiences: The contribution of valence and

arousal. *Reviews in the Neurosciences, 15*, 241 – 252. doi: 0.1073pnas.0306408101

Kensinger, E. A. (2008). Age differences in memory for arousing and nonarousing emotional

words. *Journal of Gerontology, 63B(1)*, 13 – 18. doi: 10.1093/geronb/63.1.P13

Kensinger, E. A., & Corkin, S. (2003). Memory enhancement for emotional words: Are

emotional words more vividly remembered than neutral words? *Memory and*

Cognition, 31, 1169 – 1180. doi: 10.3758/BF03195800

Kensinger, E., & Corkin, S. (2004). Two routes to emotional memory: Distinct neural process

for valence and arousal. *Proceedings of the National Academy of*

Sciences, 101, 3310 – 3315. doi: 10.1073/pnas.0306408101

LaBar, K., & Phelps, E. (1998). Arousal-mediated memory consolidation: Role of

the medial temporal lobe in humans. *Psychological Science, 9,* 490 – 493.

doi: 10.1111/1467-9280.00090

Lai – Wan, C. C., Eric, B., & Hoi – Yan, C. C. (2006). Attitudes to and practices regarding sex

selection in China. *Prenatal Diagnosis, 26*, 610 – 613. doi: 10.1002/pd.1477

Lavy, E., Van Den Hout, M., & Arntz, A. (1993). Attentional bias and spider phobia:

conceptual and clinical issues. *Behavioral Research Therapy, 31*, 17 – 24.

doi: 10.1016/0005-7967(93)90038-V

Lebanese Confessions (2007). Information International (monthly publication), 55, Retrieved

March 2nd, 2007, from http://www.iimonthly.com/categories.asp?ID=1147

MacKay, D. G., & Ahmetzanov, M. V. (2005). Emotion, memory, and attention in the taboo

Stroop paradigm: An experimental analog of flashbulb memories. *Psychological*

Science, 16, 25 – 32. doi: 10.1111/j.0956-7976.2005.00776.x

MacKay, D. G., Shafto, M., Taylor, J. K., Marian, D., Abrams, L., & Dyer, J. (2004). Relations

between emotion, memory and attention: Evidence from taboo Stroop, lexical decision,

and immediate memory tasks. *Memory & Cognition, 32,* 474 – 488.

doi: 10.3758/BF03195840

MacLeod, C. M. (1991). Half a century of research on the Stroop effect: An integrative review. *Psychological Bulletin, 109,* 163 – 203. doi: 10.1037/0033-2909.109.2.163

MacLeod, C., Mathews, A., & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology, 95,* 15 –20. doi: 10.1037/0021-843X.95.1.15

Martins, F., Oliveira, A. M., & De Sousa, L. (2003). Memory for anger words in Portuguese – French bilinguals. Unpublished manuscript.

Mathews, A., & MacLeod, C. (1985). Selective processing of threat cues in anxiety states. *Behavior Research and Therapy, 23,* 563 – 569. 10.1016/0005-7967(85)90104-4

Mathewson, K.J., Arnell, K. M., & Mansfield, C.A. (2008). Capturing and holding attention: The impact of emotional words in rapid serial visual presentation. *Memory and Cognition, 36*(1), 182 – 200. doi*: 10.3758/MC.36.1.182*

Matsumoto, D. (2007). Culture, context, and behavior. Journal of personality, 1286 - 1320. doi: 10.1111/j.1467-6494.2007.00476.x

Matsumoto, D., Yoo, S., H., & Fontaine, J. (2008). Expressive differences around the world: The relationship between emotional display rules and individualisms versus collectivism. *Journal of Cross – Cultural Psychology, 39*, 55 – 72. doi: 10.1177/0022022107311854

McGaugh, J. L. (2000). Memory: A century of consolidation. *Science, 14,* 248 – 251. doi: 10.1126/science.287.5451.248

McKenna, F. P., & Sharma, D. (1995). Intrusive cognitions: An investigation of the emotional Stroop task. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 21*, 1595 – 1607. doi: 10.1037/0278-7393.21.6.1595

Merckelbach, H., De Jong, P. J., Muris, P., Van Den Hout, M. A. (1996). The etiology of

    specific phobias: a review. *Clinical Psychology Review, 16*, 337 – 361.

    doi: 10.1016/0272-7358(96)00014-1

Most, S. B., Chun, M. M., Widders, D. M., & Zald, D. H. (2005). Attentional rubbernecking:

    Cognitive control and personality in emotion-induced blindness. *Psychonomic Bulletin*

    & Review, *12,* 654 – 661. doi: 10.3758/BF03196754

News and Politics (2013). Retrieved October 10, 2013, from

    http://www.otv.com.lb

Oatley, K., & Johnson-Laird, P. N. (1987). Towards a cognitive theory of emotions. *Cognition*

    and Emotion, 1, 29 – 50. doi: 10.1080/02699938708408362

Ohman, A. (1993). Fear and anxiety as emotional phenomena: Clinical phenomenology,

    evolutionary perspectives, and information processing mechanisms. Handbook of

    emotions. New York: Guilford Press.

Pavlenko, A. (2008). Emotion and emotion - laden words in the bilingual lexicon.

    Bilingualism: Language and Cognition, 11,147 - 164.

    doi:10.1017/S1366728908003283

Politics and Religion (2013). Retrieved from October 10, 2013, from

    http://www.almanar.com.lb

Pratto, F. & John, O.P. (1991). Automatic vigilance: The attention-grabbing power of negative

    social information. *Journal of Personality and Social Psychology, 61,* 380 – 391.

    doi: 10.1037/0022-3514.61.3.380

Raymond, J. E., Shapiro, K. L., & Arnell, K. M. (1992). Temporary suppression of visual

processing in an RSVP task: an attentional blink? *Journal of Experimental Psychology:*

Human Perception and Performance, 18, 849 – 860. doi: 10.1037/0096-1523.18.3.849

Roya News (2013). Retrieved on October 10, 2013 from

http://www.roya.tv

Saab, R., Schmid, K., & Hewstone, M. (2007). *Perceived intergroup threats, contact and*

sectarian attitudes in Lebanon. Poster presentation at the British Psychological Society-

Social Psychology Conference: Groups, Politics and Organizations, University of Kent,

Canterbury, UK.

Scherer, K. R. (2001). Appraisal considered as a process of multilevel sequential checking.

Appraisal processes in: Theory, method, and research, 92 – 120.

Sechrest, L., Flores, L., & Arellano, L. (1968). Language and social interaction in bilingual

culture. *Journal of Social Psychology, 78*, 215 – 224. doi:

10.1080/00224545.1968.9933607

Sharot, T., & Phelps, E. A. (2004). How arousal modulates memory: Disentangling the effects

of attention and retention. Cognitive, Affective, & Behavioral Neuroscience, *4*(3), 294

– 306. doi: 10.3758/CABN.4.3.294

Slobodenyuk, N., Jraissati, Y., Kanso, A, El Hajj, I. (2014). Cross-modal associations in the

case of haptic sensation and color. Manuscript in preparation.

Sutton, T. M., Altarriba, J., Gianico, J. L., & Basnight – Brown, D. M. (2007). The automatic

access of emotion: Emotional Stroop effects in Spanish–English bilingual speakers.

Cognition and Emotion, 21, 1077– 1090. doi:10.1080/02699930601054133

Tabachnick, B. G., Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA:

Allyn & Bacon/Pearson Education, xxvii980, pp. 12

The Lebanese Follow Their Leaders (2007). Information International (monthly publication),

56, retrieved Feb 1st, 2007, from

http://www.iimonthly.com/categories.asp?ID=1162

Toglia, M.P. and Battig, W.F. (1978) Handbook of Semantic Word Norms. Hillsdale, NJ:

Erlbaum.

Watts, E N., McKenna, E P., Sharrock, R., & Trezise, L. (1986). Colour naming of

Phobia – related words. *British Journal of Psychology, 77,* 97 – 108.

doi: 10.1111/j.2044-8295.1986.tb01985.x

Williams, J. M., Mathews, A., & MacLeod, C. 1996). The emotional Stroop task and

psychopathology. *Psychological Bulletin, 120*, 3 – 24. doi: 10.1037/0033-2909.120.1.3