

Words, feelings, and bilingualism

Cross-linguistic differences in emotionality of autobiographical memories*

Viorica Marian and Margarita Kaushanskaya
Northwestern University / University of Wisconsin-Madison

Cross-linguistic differences in emotionality of autobiographical memories were examined by eliciting memories of immigration from bilingual speakers. Forty-seven Russian-English bilinguals were asked to recount their immigration experiences in either Russian or English. Bilinguals used more emotion words when describing their immigration experiences in the second language (English) than in the first language (Russian). Bilinguals' immigration narratives contained more negative emotion words than positive emotion words. In addition, language preference (but not language proficiency) influenced results, with emotional expression amplified when speaking in the preferred language. These findings carry implications for organization of the bilingual lexicon and the special status of emotion words within it. We suggest that bilinguals' expression of emotion may vary across languages and that the linguistic and affective systems are interconnected in the bilingual cognitive architecture.

Fundamental to being human is the ability to use language and the ability to experience emotion. It is not surprising then, that questions regarding the relationship between language and emotion, as well as about possible differences in emotional expression across languages, have interested social scientists for years. Previous research suggests that emotion words may be represented and processed differently in the lexicon than other words (e.g., Altarriba & Bauer, 2004; Altarriba, Bauer, & Benvenuto, 1999). Although what counts as an 'emotion word' is subject to a long-standing debate in the field (e.g., Clore, Ortony, & Foss, 1987; Fehr & Russell, 1984; Johnson-Laird & Oatley, 1989; Ortony, Clore & Foss, 1987; Russell, 1991), in the present study, emotion words are defined as words that describe a positive or negative feeling, such as happy or sad, while evaluative words (e.g., interesting) or emotionally-laden words (e.g., cancer) are not considered. Previous research suggests that the difference between emotion words and other words

may stem, at least in part, from the fact that the affective valence of an emotion word is encoded in its semantic representation, and impacts its processing (e.g., Fazio, Sanbonmatsu, Powell, & Kares, 1986; Hermans, De Houwer, & Eelen, 1994). Moreover, not only do emotion words differ from other words in the lexicon, it appears that different types of emotion words are also processed differently (e.g., Cacioppo & Gardner, 1999; Watson & Clark, 1992). For instance, emotion words can carry positive valence (e.g., *happy*) or negative valence (e.g., *sad*), and the two types of valence can trigger distinct styles of cognitive processing. Specifically, negative emotional experiences are associated with a more elaborate and detailed style of cognitive processing, whereas positive experiences are associated with a more general, script-based, less-specific style of cognitive processing (e.g., Schrauf & Sanchez, 2004; Schwartz, 1990; Schwartz & Bless, 1991).

Research conducted on emotional expression in bilinguals suggests that language use modulates emotional expression, and that bilinguals will often express their emotions differently depending on the language they are speaking at the time. Not only is representation of emotion altered by bilingualism, where experience with another language influences conceptual representations of emotions (Altarriba & Canary, 2004; Stepanova & Coley, 2002), but on-line processing of emotion words may also be impacted by bilingualism. For example, Marian and Kaushanskaya (2004) found that emotional valence of memories retrieved by Russian-English bilinguals varied as a function of the language in which the memory was encoded, as well as a function of cultural variables. It has been suggested that the native language is more emotionally-laden than the second language, and appears to be bilinguals' preferred language for expressing positive emotions (e.g., Anooshian & Hertel, 1994; Javier, Barroso, & Muñoz, 1993; Sechrest, Flores, & Arellano, 1968). The second language, on the other hand, appears to allow the speaker more distance from the emotional experience (Bond & Lai, 1986; Gonzalez-Reigosa, 1976). For instance, Anooshian and Hertel (1994) found that emotion words were remembered better than neutral words in L1, but not in L2. Ayçiçeği and Harris (2004) found that the effect of emotional content on recall was greater in L2 than in L1 and that this advantage was especially strong for negative emotion words in L2. The authors proposed that use of the second language allowed bilinguals to tolerate the unpleasant mood that accompanied processing of negative emotion words. Therefore, negative emotion words could be processed deeper and recalled better in L2 than in L1. This finding is consistent with a study by Schrauf and Sanchez (2004), who found that the number of negative emotion words surpassed the number of neutral or positive emotion words in a free-recall task with speakers of English and Spanish. The authors suggest that the more detailed cognitive processing triggered by negative emotions yielded a greater number of negative emotion labels.

The objective of the present study was to examine bilinguals' emotional expression in their two languages, and to explore possible cross-linguistic differences in expression of different types of emotion. We were interested in the number of emotion words used by bilinguals in native and second-language narratives and in cognitive and linguistic constraints influencing emotion-word usage in bilinguals. Consistent with previous research (e.g., Anooshian & Hertel, 1994; Javier et al., 1993; Sechrest et al., 1968), we predicted that the number of emotion words would differ across the first and second languages. Specifically, we predicted that bilinguals would use more negative emotion words than positive emotion words, especially in the second language. This prediction was rooted in previously-discussed findings that negative emotion words are recalled more frequently than positive emotion words (Schrauf & Sanchez, 2004), that negative emotion words may be processed deeper and recalled better in L2 than in L1 (Ayçiçeği & Harris, 2004), and that the second language may allow more distance from emotional experience (Bond & Lai, 1986; Gonzalez-Reigosa, 1976).

In addition to emotion valence (positive, negative), bilinguals' use of emotion words across languages (Altarriba & Santiago-Rivera, 1994; Santiago-Rivera & Altarriba, 2002) may also be influenced by cognitive variables such as bilinguals' language proficiency. Research on language processing in bilinguals consistently demonstrates that proficiency in a language exerts an important influence on bilinguals' processing. Higher proficiency in a language results in its higher co-activation during language processing (e.g., Blumenfeld & Marian, 2007; Marian & Spivey, 2003; Perani, Paulesu, Galles, Dupoux, Dehaene, et al., 1998; Weber & Cutler, 2004) and in more elaborate semantic representations established in that language (e.g., Kroll & Stewart, 1994; Van Hell & De Groot, 1998). However, with minor exceptions (e.g., Dewaele & Pavlenko, 2002a, 2002b; Rintell, 1990) empirical research on the effect of language proficiency on use of emotion words in bilinguals has been limited.

The lack of a relationship between language proficiency and emotion-word use in previous research may stem from representational differences between emotion words and other word-types in the lexicon. Affective valence is an integral part of lexical representation for emotion words, but is not part of the lexical representation for other words (except for emotionally-laden words). Therefore, it is possible that bilinguals' use of emotion words across their two languages depends less on proficiency, and more on emotional attachment to the language. One could hypothesize that bilinguals would use more emotion words when speaking a language they prefer, leading us to examine the effects of both language proficiency and language preference on emotion word use. While language proficiency is indicative of general linguistic competence, language preference may be reflective of bilinguals' emotional attachment to what that language stands for and is

associated with. While the notions of language proficiency and language preference are not completely dissociable, we predicted that the emotional content of narratives would be susceptible to effects of language preference.

In the present research, narratives describing bilinguals' immigration experiences were used as a window into bilinguals' use of emotion words in spontaneous language production. Our choice of target event was rooted in the fact that previous research on autobiographical memory has traditionally targeted salient childhood experiences such as a birth of a sibling or moving (e.g., Usher & Neisser, 1993). Since we were certain that our participants moved from the former Soviet Union to the United States, we selected the immigration experience as one shared by all Russian-English bilinguals tested in the present study. Moreover, immigration was chosen as the topic of narratives due to the inherently emotional nature of this experience. The experience of immigration is among the most salient memories in a bilingual immigrant's personal history, defining a transition to a new language, culture, and identity. Similar to flashbulb memories (Brown & Kulik, 1982), memories of immigration are likely to be very salient and saturated with emotion (e.g., Schrauf & Rubin, 2001) and provide a particularly opportune ground for studying emotional vocabulary in bilinguals. Thus, the immigration experience was likely to provide the most uniformity and commonalities in external structure of the event, while at the same time allowing for idiosyncrasies associated with personal internal experiences.

Because some of the participants immigrated to the United States much earlier than others, we were able to examine the effect of immigration age on use of emotion words. Research on memory suggests that people often rewrite their personal histories from the vantage point of current experiences (Leary & Tangney, 2002; Schlenker, Drugolecky, & Doherty, 1994; Wilson & Ross, 2003). Because the age of language acquisition is known to impact proficiency (e.g., Johnson & Newport, 1994), which in turn is likely to impact acculturation (e.g., Schrauf, 2002), early immigrants are more likely to be better-integrated in the L2 culture. As a result, their current more-positive vantage point may impact recall of autobiographical memories associated with immigration. Therefore, we predicted that early immigration would be associated with use of more positive emotion words than late immigration, while late immigration would be associated with use of more negative emotion words than early immigration. This prediction is consistent with intuitive notions that late immigrants may experience greater disruption and a more truncated sense of self as a result of immigration and that early immigration may allow greater temporal distance between the immigration experience and the time of narrative.

In sum, the present study examined the use of emotion words within the context of narrative-production, with bilinguals recounting their immigration

experiences in their first or second languages. Of particular interest were the effects of language on emotional expression in bilinguals and the relationship between bilinguals' emotion lexicon and other variables, such as emotion type, language proficiency, language preference, and age at the time of the narrated event. Specifically, the following three hypotheses were tested: (1) that the number of emotion words used in autobiographic narratives would differ across the first and second languages; (2) that positive and negative emotion words would be differentially susceptible to the effects of language preference and language proficiency, and (3) that immigration age would influence the use of emotion words across the two languages. We were also interested in exploring the relationship between emotion words in a narrative and ratings of overall emotionality of narratives. To consider these issues, we examined bilinguals' working emotion vocabulary, with working emotion vocabulary defined as words that were immediately available to individuals as they thought through their experience (as proposed by Schrauf & Sanchez, 2004).

Method

Participants

Forty-seven Russian-English bilinguals, 23 males and 24 females participated in the study. Their mean age at the time of the experiment was 21 years ($SD=2.6$ years) and their mean age at the time of immigration to the United States was 14 years ($SD=3.4$ years). Both language preference and language proficiency ratings were obtained for each participant. All participants were queried about their language preference at the end of the experiment. Ten participants indicated that Russian was their preferred language of communication (21.3%), 26 participants indicated that English was their preferred language of communication (55.3%), and 11 participants indicated no language preference (23.4%). In addition, two independent coders rated bilinguals' proficiency on a Likert scale from 1 (*low proficiency*) to 5 (*high proficiency*). Proficiency was defined in terms of fluency of expression, richness of vocabulary, and absence of grammatical errors. Disagreements were discussed until a consensus was reached. The independent ratings revealed that, on average, bilinguals were more proficient in Russian ($M=3.98$, $SE=0.67$) than in English ($M=3.43$; $SE=0.69$), paired-sample $t(46)=3.33$, $p<0.01$.

Because language preference was rated on a three-point scale (Russian, English, no preference), while proficiency ratings were on a five-point scale, proficiency ratings were transformed into three-point language proficiency ratings (Russian-dominant, English-dominant, balanced) in order to compare the two.

As a result, 25 bilinguals (53%) were placed into the Russian-dominant group, 7 bilinguals (15%) were placed into the English-dominant group, and 15 bilinguals (32%) were placed into the Balanced group.

Design and procedure

Following the tradition of narrative analysis research, the study used an ecologically-valid narrative elicitation technique (Neisser, 1978; Koriat & Goldsmith, 1996). Participants were interviewed individually about their immigration experience and were asked to describe the process of immigration to the United States in detail. The experimenter was a fluent speaker of Russian and English, with expertise in narrative-data collection. Half of the participants (24) were interviewed in Russian, while the other half (23) were interviewed in English. The participants were explicitly instructed not to switch into the other language when narrating. All participants followed those instructions and no code-switching was observed. All interviews were tape-recorded. This dataset, focusing on memories of immigration, was collected from the same participants and during the same session as the dataset reported in Marian and Kaushanskaya (2004) in which participants were prompted with cue words and asked to provide the first memory that came to mind; however the immigration narrative data have not been previously transcribed, coded, analyzed or reported elsewhere.

Coding and analyses

We defined emotion words as words that described a positive or negative feeling, with evaluative and emotionally-laden words excluded. Context effects, however, were taken into account when identifying emotion words. Previous research suggests that emotional context plays a significant role in whether words are processed as emotion words or as other word-types (Anderson & Shimamura, 2005; Brierley, Medford, Shaw, & David, 2007). Therefore, statements such as "it was hard" were coded contextually (with the modifier "hard" coded as a negative emotion word) whenever they expressed the speaker's feelings towards an experience, but were not coded as emotion words in other contexts. Similarly, words such as 'crying' were coded contextually so as to clarify whether the crying conveyed a positive or negative emotion. When coding emotion words, we focused on raw number of emotion words rather than number of different emotion words. This approach was used because Dewaele and Pavlenko (2002) found that language proficiency was not a significant predictor of emotion-word use when the number of different emotion words was the dependent variable, but was a significant predictor of emotion-word use when the raw number of emotion words was the dependent variable.

The positive and negative emotion words analyzed are shown in Appendix A. Positive words were defined as words expressing a positive emotion (e.g., *happy*, *excited*). Negative words were defined as words expressing a negative emotion (e.g., *cried*, *scared*). Evaluative terms (e.g., *interesting*) were not included in analyses. Emotion words were coded within the associated semantic context, for instance the word *screamed* could be coded as positive or negative, depending on the surrounding circumstances. Each positive word was assigned a value of 1, and each negative emotion word was assigned a value of -1. By averaging these values, a ratio indexing lexically-based emotion valence was determined for each narrative.

Two independent coders transcribed the narratives and two other independent coders identified all emotion words and coded their valence. Narratives were transcribed by two Russian-English bilinguals; disagreements were discussed until consensus was reached for 100% agreement. In addition, a third rater coded 10% of all data independently. Inter-rater reliability between the third coder and the two original coders was 90%. Two independent coders rated emotion words in each narrative. Point-to-point reliability for detection of emotion words was 92% for positive emotion words and 81% for negative emotion words.

Narratives typically followed a script that included departure, travel, and arrival components. Narrative length, as measured by total word count, was similar across Russian ($M=244.21$, $SE=45.81$) and English ($M=201.62$, $SE=46.79$), $F(1, 45) < 0.01$, $p=0.995$ in bilinguals' recounts of their immigration experiences. Because there were no differences in total word count across languages, and because the low overall incidence of emotion words relative to total number of words precluded analyses on proportion of emotion words relative to total word count, all analyses were performed on the actual number of emotion words.

The number of emotion words was analyzed for type of emotion (positive, negative) and for language (Russian, English) effects using an Analysis of Variance. In addition, to examine possible effects of language preference and language proficiency on emotional expression, separate Analyses of Variance included Language Proficiency (Russian, English, Balanced) and Language Preference (Russian, English, No Preference) as independent between-subjects variables. To examine possible effects of immigration age on emotional expression, the continuous variable of immigration age was correlated with the number of emotion words across and within languages. Finally, to gain insight into the relationship between emotion word use and overall ratings of emotionality of narratives, exploratory correlation analyses were also conducted. Global emotionality ratings were collected for two dependent variables: emotional intensity (rated on a scale from 1-no emotion to 6-extremely high intensity) and emotional valence (rated on a scale from 1-completely negative affect to 7-completely positive affect).

Results

Language and emotional expression

To examine the effect of language on bilinguals' use of emotion words, a 2×2 Analysis of Variance, with emotion type (positive, negative) as a within-subjects variable and language (Russian, English) as a between-subjects variable was performed. Results revealed a main effect of emotion type, $F(1, 45) = 16.88$, $p < 0.001$ and a marginally-significant main effect of language, $F(1, 45) = 3.03$, $p = 0.08$, as well as a significant interaction between emotion type and language, $F(1, 45) = 4.64$, $p < 0.05$. Participants used more negative emotion words ($M = 2.01$, $SE = 0.30$) than positive emotion words ($M = 0.79$, $SE = 0.15$), $p < 0.01$. Bilinguals used more emotion words when speaking their second language, English ($M = 1.72$, $SE = 0.26$) than when speaking their first language, Russian ($M = 1.08$, $SE = 0.26$). Follow-up comparisons for the interaction revealed that bilinguals produced more negative emotion words when speaking English ($M = 2.65$, $SE = 0.43$) than when speaking Russian ($M = 1.38$, $SE = 0.42$), $F(1, 45) = 4.61$, $p < 0.05$, but the difference in the number of positive emotion words across languages did not reach significance, $p > 0.1$.

Language preference versus language proficiency

To examine the effects of language preference and language proficiency on emotional expression, language preference and language proficiency were each added independently to the previous 2×2 Analysis of Variance. When language preference (Russian, English, no preference) was included as an independent variable, a marginally significant interaction among language preference, language, and emotion type was observed, $F(2, 41) = 2.74$, $p = 0.07$, suggesting that language preference impacts the interaction between language and emotional expression. When language proficiency (Russian, English, Balanced) was included as an independent variable, it did not yield a main effect, and did not interact with other variables ($p > 0.1$), suggesting that language proficiency did not impact the use of emotion vocabulary. To follow up on the three-way interaction between language preference, language, and emotion type, Univariate Analyses of Variance were performed for each language-preference group, with language as an independent variable and number of emotion words as the dependent variable (see Figure 1). Participants who preferred English (L2) used more negative emotion words when speaking English ($M = 2.67$, $SE = 0.51$) than when speaking Russian ($M = 1.07$, $SE = 0.67$), $F(1, 24) = 5.36$, $p < 0.05$, but produced comparable numbers of positive emotion words across the two languages, $p > 0.4$. Participants who preferred Russian (L1)

used more negative emotion words when speaking Russian ($M = 3.33$, $SE = 1.54$) than when speaking English ($M = 2.75$, $SE = 0.94$), and used more positive emotion words when speaking English ($M = 1.38$, $SE = 0.42$) than when speaking Russian ($M = 0.33$, $SE = 0.68$), $F(1, 9) = 1.70$, but these differences did not reach significance, $p > 0.1$. Finally, participants with no language preference used more positive emotion words when speaking Russian ($M = 0.71$, $SE = 0.16$) than when speaking English ($M = 0.01$, $SE = 0.24$), $F(1, 8) = 6.00$, $p < 0.05$, but produced comparable number of negative emotion words across the two languages, $p > 0.4$.

Immigration and emotional expression

Across all immigration narratives, immigration age correlated negatively with total word count ($R = -0.35$, $p < 0.01$), so that earlier immigration was associated with longer narratives in both languages. Immigration age also correlated negatively with emotional valence ($R = -0.24$, $p = 0.15$), so that earlier immigration was associated with more positive emotion words. It appears that these general correlation patterns were driven primarily by narratives produced in Russian. When Russian narratives were considered separately, immigration age correlated with total word count ($R = -0.65$, $p < 0.01$), and with number of positive emotion words ($R = -0.44$, $p < 0.05$). When speaking Russian, earlier immigration age was associated with longer narratives and with use of more positive-emotion words. When English narratives were considered separately, no significant correlations were observed between immigration age and other variables, suggesting that immigration age influenced emotional expression in the native, but not in the second language.

Emotion words and global emotionality ratings

To explore the relationship between global ratings of intensity and valence and lexical measures (number of emotion words and ratio of positive to negative emotion words), correlation analyses were performed. Results revealed that global ratings of intensity correlated positively with total number of words in the narrative ($R = 0.55$, $p < 0.01$), with total number of emotion words in the narrative ($R = 0.51$, $p < 0.01$), and with number of positive ($R = 0.38$, $p < 0.01$) and negative emotion words ($R = 0.48$, $p < 0.01$). Global ratings of positive/negative affect correlated with the ratio of positive to negative emotion words ($R = 0.51$, $p < 0.01$), and correlated negatively with the number of negative emotion words ($R = -0.40$, $p < 0.01$). Russian narratives tended to be rated overall as more positive ($M = 3.46$, $SE = 0.29$) than English narratives ($M = 2.96$, $SE = 0.30$) and tended to elicit higher-intensity ratings ($M = 3.25$, $SE = 0.25$) than English narratives ($M = 2.74$, $SE = 0.26$), however, these differences did not reach significance, $p > 0.1$.

Discussion

In sum, when speaking about immigration, bilinguals used more emotion words overall in their second language, and used more negative emotion words than positive emotion words. In addition, language preference mediated use of emotion words, so that speaking in a preferred language enhanced accessibility of emotion words. Finally, age at immigration impacted the emotionality of narratives so that earlier age at immigration was associated with increased use of positive emotion words.

Results of the present study suggest that emotional expression in bilinguals is influenced by the language spoken at any given time. The bilinguals tested in this study used more emotion words in their second language than in their native language. There are at least two possible explanations for this pattern. The first relies on the hypothesis that people from individualistic cultures, such as the USA, are more emotionally-expressive than people from collectivist cultures, such as East Asia and the former Soviet Union (Basabe, Paez, Valencia, Gonzalez, Rime, et al., 2002; Markus & Kitayama, 1991; Matsumoto, 1989; Realo & Alik, 1999; Triandis, 1995). This hypothesis, while driven by cultural influences, contradicts cross-linguistic findings that lexical diversity of emotion discourse is higher in Russian than in English (Pavlenko, 2002 a, 2002b; Pavlenko & Dragina, 2007; Wierzbicka, 1998).

The second hypothesis is one that is more consistent with previous cross-linguistic research, and relies on findings that bilinguals express more emotion in the native than in the second language, (e.g., Anoooshian & Hertel, 1994; Javier et al., 1993; Sechrest et al., 1968; but see Pavlenko, 2005). Because the use of the second language may allow the speaker more distance from the emotional experience (Bond & Lai, 1986; Gonzalez-Reigosa, 1976) and because L2 may be less emotionally-laden, one may need to use more emotion words to achieve the same emotional quality in the 2 narrative as when speaking the native language. This second hypothesis is also consistent with studies of language-dependent memory (Marian & Fausey, 2006; Marian & Kaushanskaya, 2007; Marian & Neisser, 2000) which suggest that memory retrieval is improved when the language spoken at the time of retrieval matches the language spoken at the time of encoding. In the present study, immigration narratives were encoded in Russian, since none of the participants reported speaking English at the time of immigration. Retrieval in English may have provided more distance from the experience, therefore allowing more emotional expression. This hypothesis is also consistent with Pavlenko (2005), who suggested that some bilinguals may find it easier to talk about emotions in their second language precisely because it is less emotional. Whether the observed cross-linguistic differences in emotional expression were due to differences in representation of emotion (as suggested by the first hypothesis), to

differences in processing aspects (as suggested by the second hypothesis), or both, is a question for future research.

In addition, results of the present study revealed that bilinguals used more negative than positive emotion words. This may be due in part to the frequently traumatic nature of the immigration experience. Futures studies may be able to examine the generalizability of these findings to other types of autobiographical memories in bilinguals. It is possible that people use more negative emotion words than other emotion words in their autobiographical memories in general. Previous research has shown that the number of negative emotion words in the lexicon is typically higher than the number of positive emotion words (Schrauf & Sanchez, 2004) and that young people (similar to those tested in the present study) are especially prone to lower positive affect (e.g., Labouvie-Vief & Medler, 2002). This latter piece of evidence suggests that autobiographical narratives are likely to be more positive in older individuals and is consistent with research indicating that age correlates positively with affect and that older people remember things in a more positive light than younger people (Rubin & Berntsen, 2003). Finally, it is also possible that people are generally more verbose when sharing negative experiences than when sharing positive ones, possibly because they are less comfortable sharing their achievements for fear of being perceived boastful or conceited, or because it is simply cathartic or otherwise emotionally therapeutic to discuss negative events and negative feelings (Pennebaker, 1997a, 1997b). This last hypothesis is consistent with the finding that bilinguals produced more negative emotion words when speaking in L2 than when speaking in L1. That is, if a second language predisposes one to use more emotion words, and if one is more verbose when sharing negative experiences than when sharing positive ones, then it is not surprising that the largest differences were observed for the number of negative emotion words used when speaking English. This finding is also consistent with a suggestion by Pavlenko (2005) that some bilinguals prefer to undergo psychoanalysis and counseling in their second language because they may be more comfortable using that language when discussing negative and traumatic events.

In addition to the overall influence of language on emotional expression in bilinguals, separate analyses were performed to examine the role of language preference and language proficiency in emotional expression. Results of the present study suggest that language preference may have closer ties to the emotion lexicon than language proficiency. It is possible that, although language proficiency is generally a better predictor of bilingual performance, access to the emotion lexicon may be more constrained by language preference. Because emotional valence is tied to the mental representation of emotion words, feelings towards a language influence the accessibility of emotion words. The finding that language preference influenced accessibility of emotion words confirms that emotion words

are represented somewhat differently in the mental lexicon than other word-types (e.g., Altarriba, 2003; Altarriba & Bauer, 2004; Altarriba et al, 1999).

Since the present narratives focused on the experience of immigration, we wanted to examine the impact that age at the time of immigration has on the emotional content of immigration narratives. Results suggest that bilinguals who immigrated to the United States at an earlier age tended to produce longer narratives, use more emotion words, and include more positive emotion words than bilinguals who immigrated to the US at a later age. While the higher overall number of emotion words could be an artifact of longer narratives in general, the finding that the number of positive emotion words was higher in narratives produced by early immigrants than by late immigrants is likely genuine. If it were an artifact of narrative length, both negative and positive emotion words would be more numerous in early bilinguals. The finding that early bilinguals produced more positive emotion words when speaking about immigration, in spite of the overall higher number of negative emotion words, suggests that early bilinguals are more likely to view their immigration experience positively. The more positive memories of early immigrants may be due to the greater distance in time between the immigration experience and the time of narrative. Moreover, since people often rewrite their personal histories from the vantage point of current experiences, early immigrants (who are more likely to have achieved a non-accented native-like fluency in the second language and to have integrated themselves into the L2 culture) may be recasting their immigration experience as a positive event. Regardless of the possible mechanisms, these differences between early and late immigrants were greater in native-language narratives, further reinforcing the hypothesis that the language used at any given time impacts emotional expression.

Although the present study focused on the emotional lexicon of bilinguals and examined use of positive and negative emotion words, we also performed exploratory analyses on the global emotionality ratings of bilingual narratives. The patterns revealed by correlation analyses suggest that lexical measures of emotionality (number of emotion words, ratio of positive to negative emotion words) are predictive of global ratings of affect and intensity. Higher global valence ratings reflected more positive emotion words and fewer negative emotion words, and higher intensity ratings reflected longer narratives and more emotion words. In other words, when people make judgments about the overall emotionality of a narrative (intensity, valence), one of the many cues they rely upon is the use of emotion words. Although it is certainly not the case that listeners count the number of emotion words or compute ratios of positive to negative words, they seem to be sensitive to these subtle measures of lexical affect, as the observed significant correlations suggest. Future research may specifically target the relationship between global ratings of emotionality and lexical measures of emotion to examine

how specific characteristics of the bilingual mental lexicon impact emotional expression.

Together, results of the present study revealed that bilinguals' immigration narratives contained more negative emotion words than positive emotion words, possibly reflecting the nature of the immigration experience. Bilinguals also used more emotion words when describing their immigration experiences in English (L2) than in Russian (L1). In addition, language preference (but not language proficiency) influenced results, with more negative-emotion words used when describing the immigration experience in one's preferred language. It is possible that, although language *proficiency* is generally a better predictor of bilingual performance, access to the emotion lexicon may be more constrained by language *preference*.

To conclude, the present research suggests that a bilingual's emotional expressiveness is determined by the language s/he speaks, as well as by language preference. When using their native language, bilinguals may draw on their emotional lexicon differently than when using their second language, even when recounting the same experience. Speaking a particular language may activate a socio-cultural framework associated with that language, which in turn may influence access to the emotion lexicon. It appears that the relationship between language and emotion is bi-directional, where not only does language influence emotional content, but the opposite is also true, with non-linguistic emotional content influencing language use. The impact of language preference on the frequency of emotion words suggests fluid dynamics between the global affective system and the mental lexicon, so that as feelings towards a language and culture change, the access to the emotion lexicon may change as well. Although this study does not directly test whether language is an encapsulated system (Fodor, 1983), or whether it interacts with other cognitive systems (such as emotion), the finding that accessibility of emotion is constrained by language use suggests that language and emotion interact in a way that is consistent with a non-modular view of language. The emotion lexicon lies at the intersection of two cognitive systems — language and emotion, thus providing a unique window into the interaction between the two.

Note

* This research was supported in part by grants NSF-BCS-0418495 and NICHD-1R03HD046952 to the first author. We thank Avital Rabin, Sonya Nosonovsky, Elena Dukhovny, and Caitlin Fausey for their assistance with data transcription and coding, and Henrike Blumenfeld, Anthony Shook, Melissa Baese, Caroline Engstler, and Daphne Sajous-Brady for helpful comments and suggestions.

References

- Altarriba, J. (2003). Does *cariño* equal liking? A theoretical approach to conceptual nonequivalence between languages. *International Journal of Bilingualism*, 3, 305–322.
- Altarriba, J., & Bauer, L. M. (2004). The distinctiveness of emotion concepts: A comparison between emotion, abstract, and concrete words. *American Journal of Psychology*, 117, 389–410.
- Altarriba, J., Bauer, L. M., & Benvenuto, C. (1999). Concreteness, context availability, and imageability ratings and word associations for abstract, concrete, and emotion words. *Behavior Research Methods, Instruments, & Computers*, 31, 578–602.
- Altarriba, J., & Canary, T. M. (2004). Affective priming: The automatic activation of arousal. *Journal of Multilingual and Multicultural Development*, 25, 248–265.
- Altarriba, J., & Santiago-Rivera, A. L. (1994). Current perspectives on using linguistic and cultural factors in counseling the bilingual Spanish-speaking client. *Professional Psychology: Research and Practice*, 25, 388–397.
- Anderson L., & Shimamura, A. P. (2005) Influences of emotion on context memory while viewing film clips. *American Journal of Psychology*, 118, 323–337.
- Anooshian, L. J., & Hertel, P. T. (1994). Emotionality in free recall: A case of language specificity in bilingual memory. *Cognition and Emotion*, 8, 503–514.
- Ayçiçeği, A., & Harris, C. L. (2004). Bilinguals' recall and recognition of emotion words. *Cognition and Emotion*, 18, 977–987.
- Basabe, N., Paez, D., Valencia, J., Gonzalez, J. L., Rime, B., & Diener, E. (2002). Cultural dimensions, socioeconomic development, climate, and emotional hedonic level. *Cognition and Emotion*, 16, 103–125.
- Blumenfeld, H.K., & Marian, V. (2007). Constraints on parallel activation in bilingual spoken language processing: Examining proficiency and lexical status using eye-tracking. *Language and Cognitive Processes*, 22, 633–660.
- Bond, M. H., & Lai, T. M. (1986). Embarrassment and code-switching into a second language. *Journal of Social Psychology*, 126, 179–186.
- Brierley, B., Medford, N., Shaw, P., & David, A. S. (2007). Emotional memory for words: Separating content and context. *Cognition & Emotion*, 21, 495–521.
- Brown, R., & Kulik, J. (1982). Flashbulb memories. In U. Neisser (Ed.), *Memory Observed* (pp. 23–40). New York: Freeman.
- Cacioppo, J. T., & Gardner, W. L. (1999). Emotion. *Annual Review of Psychology*, 50, 191–214.
- Clore, G. L., Ortony, A., & Foss, M. A. (1987). The psychological foundations of the affective lexicon. *Journal of Personality and Social Psychology*, 53, 751–766.
- Dewaele, J.-M., & Pavlenko, A. (2002). Emotion vocabulary in interlanguage. *Language Learning*, 52(2), 265–324.
- Fazio, R.H., Sanbonmatsu, D.M., Powell, M.C., & Kares, F.R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology*, 50, 229–238.
- Fehr, B., & Russell, J. A. (1984). Concept of emotion viewed from a prototype perspective. *Journal of Experimental Psychology: General*, 113, 464–486.
- Fodor, J. (1983). *The Modularity of Mind*. Cambridge, MA: MIT Press.
- Gonzalez-Reigosa, F. (1976). The anxiety-arousing effect of taboo words in bilinguals. In C. D. Spielberger & R. Diaz-Guerrero (Eds.), *Cross-Cultural Anxiety* (pp. 89–105). Washington, DC: Hemisphere.

- Hermans, D., De Houwer, J., & Eelen, P. (1994). The affective priming effect: Automatic activation evaluation information in memory. *Cognition and Emotion*, 8, 515–533.
- Javier, R. A., Barroso, F., & Muñoz, M. A. (1993). Autobiographical memory in bilinguals. *Journal of Psycholinguistic Research*, 22, 319–338.
- Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, 21, 60–99.
- Johnson-Laird, P. N., & Oatley, K. (1989). The language of emotions: an analysis of a semantic field. *Cognition and Emotion*, 3, 81–123.
- Koriat, A., & Goldsmith, M. (1996). Memory metaphors and the real-life/laboratory controversy. *Behavioral and Brain Sciences*, 19, 167–228.
- Kroll, J. F., & Stewart, F. (1994). Category interference in translation and picture naming: Evidence for asymmetric connections between bilingual memory representations. *Journal of Memory and Language*, 33, 149–174.
- Labouvie-Vief, G., & Medler, M. (2002). Affect optimization and affect complexity: Modes and styles of regulation in adulthood. *Psychology and Aging*, 17, 571–588.
- Leary, M. R., & Tangney, J. P. (2002). *Handbook of Self and Identity*. Guilford, New York.
- Marian, V., & Fausey, C. M. (2006). Language-dependent memory in bilingual learning. *Applied Cognitive Psychology*, 20, 1–23.
- Marian, V., & Kaushanskaya, M. (2004). Language-mediated self-construal and emotion in bilinguals. *Journal of Memory and Language*, 51, 190–201.
- Marian, V., & Kaushanskaya, M. (2007). Language context guides memory content. *Psychonomic Bulletin & Review*, 14, 5, 925–933.
- Marian, V., & Neisser, U. (2000). Language-dependent recall of autobiographical memories. *Journal of Experimental Psychology: General*, 129, 361–368.
- Marian, V., & Spivey, M. (2003). Competing activation in bilingual language processing: Within- and between-language competition. *Bilingualism: Language and Cognition*, 6, 97–115.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implication for cognition, emotion, and motivation. *Psychological Review*, 98, 224–253.
- Matsumoto, D. (1989). Cultural influences on the perception of emotion. *Journal of Cross-Cultural Psychology*, 20, 92–105.
- Neisser, U. (1978). Memory: What are the important questions? In P. Grunenberg and R. N. Sykes (Eds.), *Practical Aspects of Memory*. London: Academic Press.
- Ortony, A., Clore, G. L., & Foss, M. A. (1987). The referential structure of the affective lexicon. *Cognitive Science*, 11, 341–364.
- Pavlenko, A. (2002a). Emotions and the body in Russian and English. *Pragmatics and Cognition*, 10(1–2), 201–236.
- Pavlenko, A. (2002b). Bilingualism and emotions. *Multilingua*, 21(1), 45–78.
- Pavlenko, A. (2005). *Emotions and Bilingualism*. Cambridge University Press; Cambridge, New York.
- Pavlenko, A., & V. Driagina (2007) Russian emotion vocabulary in American learners' narratives. *Modern Language Journal*, 91, 2.
- Pennebaker, J. W. (1997a). *Opening Up: The Healing Power of Expressing Emotion*. New York: Guilford Press.
- Pennebaker, J. W. (1997b). Writing about emotional experiences as a therapeutic process. *Psychological Science*, 8, 162–166.

- Perani, D., Paulesu, E., Galles, N. S., Dupoux, E., Dehaene, S., Bettinardi, V., Cappa, S. F., Fazio, F., & Mehler, J. (1998). The bilingual brain: Proficiency and age of acquisition of the second language. *Brain*, 121, 1841–1852.
- Realo, A., & Allik, J. (1999). A cross-cultural study of collectivism: A comparison of American, Estonian, and Russian students. *The Journal of Social Psychology*, 139, 133–142.
- Rintell, E. M. (1990). That's incredible: Stories of emotion told by second language learners and native speakers. In R. Scarcella, E. Andersen, & S. Krashen (Eds.), *Developing Communicative Competence in a Second Language* (pp. 75–94). Boston, MA: Heinle & Heinle Publishers.
- Rubin, C., & Berntsen, D. (2003). Life scripts help to maintain autobiographical memories of highly positive, but not highly negative, events. *Memory and Cognition*, 31, 1–14.
- Russell, J. (1991). Culture and the categorization of emotions. *Psychological Bulletin*, 110, 426–450.
- Santiago-Rivera, A. L., & Altarriba, J. (2002). The role of language in therapy with the Spanish-English bilingual client. *Professional Psychology: Research and Practice*, 33, 30–38.
- Schlenker, B., Dlugolecki, D. W., & Doherty, K. (1994). The impact of self-presentations, on self-appraisal and behavior: The power of public commitment. *Personality and Social Psychology Bulletin*, 20, 20–33.
- Schrauf, R. W. (2002). Comparing cultures within-subjects: A cognitive account of acculturation as a framework for cross-cultural study. *Anthropological Theory*, 2(1), 98–115.
- Schrauf, R. W., & Rubin, D. C. (2001). Effects of voluntary immigration on the distribution of autobiographical memory over the lifespan. *Applied Cognitive Psychology* 15, S75–S88.
- Schrauf R. W., & Sanchez, J. (2004). The preponderance of negative emotion words across generations and across cultures. *Journal of Multilingual and Multicultural Development*, 25(2–3), 266–284.
- Schwartz, N. (1990). Feelings as information: Informational and motivational functions of affective states. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of Motivation and Cognition: Foundations of Social Behavior* (pp. 527–561). New York: Guilford Press.
- Schwartz, N., & Bless, H. (1991). Happy and Mindless, but Sad and Smart? The Impact of Affective States on Analytical Reasoning. In J. Forgas (Ed.), *Emotion and Social Judgments* (pp. 55–71). Oxford: Pergamon Press.
- Sechrest, L., Flores, L., & Arellano, L. (1968). Language and social interaction in bilingual culture. *Journal of Social Psychology*, 78, 215–224.
- Stepanova, O., & Coley, J. D. (2002). The green-eyed monster: Concepts of envy and jealousy in Russian and English. *Journal of Cognition & Culture*, 2, 235–262.
- Triandis, H. C. (1995). *Individualism and Collectivism*. Boulder, CO: Westview Press.
- Usher, J. A., & Neisser, U. (1993). Childhood amnesia and the beginning of memory for four early life events. *Journal of Experimental Psychology: General*, 122, 155–165.
- Van Hell, J. G., & De Groot, A. M. B. (1998). Conceptual representation in bilingual memory: Effects of concreteness and cognate status in word association. *Bilingualism: Language and Cognition*, 1, 193–211.
- Watson, D., & Clark, L. A. (1992). Affects separable and inseparable: On the hierarchical arrangement of the negative affects. *Journal of Personality and Social Psychology*, 62, 489–505.
- Weber, A., & Cutler, A. (2004). Lexical competition in non-native spoken word recognition. *Journal of Memory and Language*, 50, 1–25.
- Wilson, A. E., & Ross, M. (2003). The identity function of autobiographical memory: Time is on our side. *Memory*, 11, 137–149.
- Wierzbicka, A. (1998). Russian emotional expression. *Ethos*, 26, 456–483.

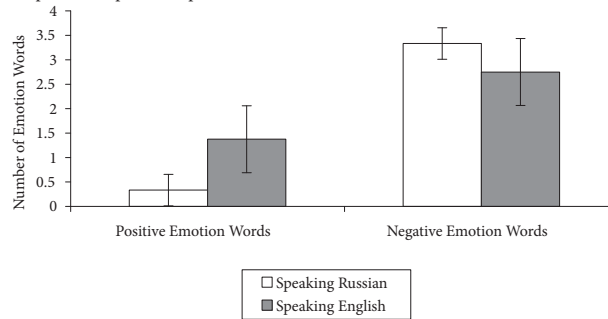
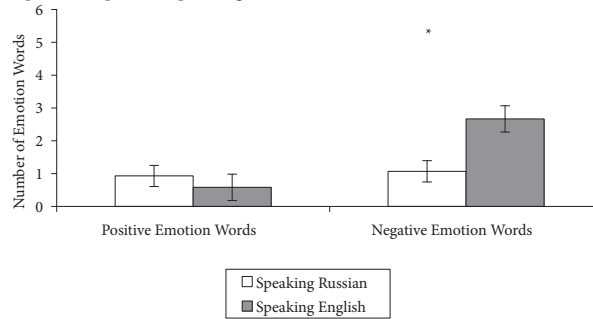
Author's address

Dr. Viorica Marian
 Department of Communication Sciences and Disorders
 Northwestern University
 2240 Campus Drive
 Evanston, IL 60208-3570
 E-mail: v-marian@northwestern.edu

Appendix A. List of emotion words generated by the Russian-English bilinguals tested

Positive Emotion Words	Con- textual Scoring	Fre- quen- cy	Negative Emotion Words	Con- textual Scoring	Fre- quen- cy
Russian Immigration Narratives					
(было) хорошо/(bylo) horosho; (was) pleasant/nice		4	(был) шок/(byl) shok; (was) shocked		2
(было) приятно/(bylo) priyatno; (was) pleasant		3	(был) стресс/(byl) stress; (was) stressed		1
(было) смешно/(bylo) smeshno; (was) funny		2	(было) грустно/(bylo) grustno; (was) sad		3
чувствовала спокойно/chuvstovala spokoyno; felt fine		1	(было) напряженно/ (bylo) naprazhenno; (was) tense		1
не беспокоило/ne bespokoilo; did not worry		1	(было) неприятно/(bylo) nepriyatno; was unpleasant		1
любил/и/а/ l'ubil/i/a; loved		2	(было) плохо/(bylo) ploho; (was/felt) bad		3
нравилось/понравилось nrazilos'/ponrazilos'; liked		5	(было) противно/(bylo) protivno; (was) disgusting		3
обалдела/obaldela; (was) stunned	√	1	(было) страшно/ (bylo) strashno; (was) scary		1
			(было) тяжело/(bylo) tazhelo; (was) hard		4
			(было) жалко/(bylo) zhalko; (felt) pity		1
			не любят/не l'ubyat; do not love		1
			не понравилось/ne ponrazilos'; do not like		2
			не выносил/ne vynosil; could not stand		1
			боялись/boyalis'; (was) afraid		1
			несчастные/neschastnye; unfortunate or miserable		1

		неудовольствие/ neudovolstvie; dissatisfaction or displeasure		1
		плакали/заплакали/ plakali/zaplakali	√	4
		cried		
		(неприятно) поразило/nepriyatno porazilo; struck as unpleasant	√	1
		скучала/skuchala; missed		1
Total Number	19			33
English Immigration Narratives				
(felt) awesome	1	(didn't) enjoy		1
(felt) lucky	2	(didn't) like		3
(was) amazed	1	(felt) bad	√	2
(was) cool	1	(felt) crazy	√	2
(was) laughing	2	(felt) depressed		1
(was) smiling	1	(felt) insane	√	1
enjoyed	1	(felt) nasty	√	2
excited	3	(felt) nauseated		1
happy	3	(felt) sorry		1
liked	2	(felt) uncomfortable		1
		(felt) upset		1
		(felt) useless		1
		(was not) happy		2
		(was) annoyed		1
		(was) awful		1
		(was) crying	√	5
		(was) frightened		1
		(was) hard	√	9
		(was) painful		1
		(was) scared		2
		(was) screaming	√	2
		(was) stressful		4
		(was) struck		1
		(was) struggling		1
		(was) tiresome		1
		(was) troubled		1
		(was) unpleasant		1
		(was) worried		3
		afraid		2
		disappointed		3
		kill myself		1
		nervous		2
		sad		1
Total Number	17			62

A. Participants who prefer to speak *Russian*B. Participants who prefer to speak *English*

C. Participants with no language preference

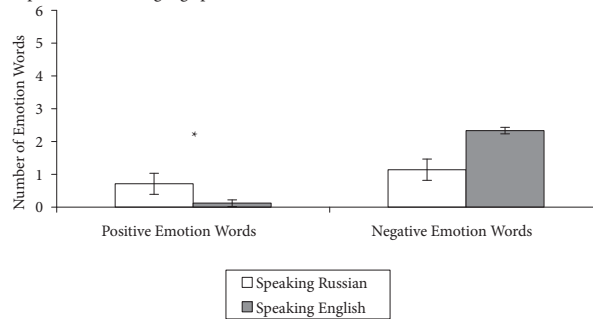


Figure 1. The number (Mean, SE) of positive and negative emotion words retrieved by bilinguals as a function of language preference.

Structural and conceptual equivalence in the acquisition and use of emotion words in a second language

Aneta Pavlenko
Temple University

The purpose of the study presented here is to examine the importance of structural and conceptual (non-)equivalence in the acquisition and use of emotion words in a second language (L2). The use of these words is examined in a corpus of 206 narratives collected with two stimuli from first language (L1) speakers of Russian and English, and L2 learners of Russian and English. The results of the quantitative and qualitative analyses of lexical choices made by the participants show that in the case of structural non-equivalence L2 learners can shift patterns of structural selection in the mental lexicon. Thus, L2 learners of English pattern with L1 English speakers in favoring adjectival constructions in the same context where L1 and L2 Russian speakers favor verbs. Conceptual non-equivalence, on the other hand, was shown to complicate acquisition of emotion words and lead to negative transfer, lexical borrowing, and avoidance. Implications are offered for models of the bilingual mental lexicon and for L2 instruction.

Cross-linguistic studies show that emotion lexicons may differ in structural and conceptual organization. In terms of structure, they may differ in dominant patterns of emotion encoding: Dutch speakers, for instance, favor emotion nouns, English speakers adjectives, and Russian speakers verbs (Pavlenko, 2002a, 2005; Semin, Gorts, Nandram, & Semin-Goossens, 2002). Emotion lexicons may also differ in conceptual organization, reflecting distinct cultural norms governing the domain of emotions in different societies. In some languages this domain may be more salient, differentiated, and codable than in others; as a result, some emotion words may have no translation equivalents in other languages, while others may have two or three partial equivalents (Panayiotou, 2006; Pavlenko, 2005; Schmidt-Atzert & Park, 1999; Stepanova Sachs & Coley, 2006; Wierzbicka, 1992, 1999).

What do these differences mean for the acquisition and use of emotion words in a second language (L2)? More specifically, what happens when the first language