



Self-construal and emotion in bicultural bilinguals

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Abstract

Autobiographical memories retrieved by bicultural Russian-English bilinguals were compared across languages. Results suggest that bilinguals' languages may influence cognitive styles, so that when speaking a language associated with a more individualistic culture, bilinguals produce more individualistic narratives, whereas when speaking a language associated with a more collectivist culture, bilinguals produce more collectivist narratives, regardless of language of encoding, or main agent in the narrative. Moreover, bilinguals expressed more intense affect when speaking the same language at the time of retrieval that they spoke at the time when the event took place. The positive/negative emotional valence of autobiographical narratives was influenced by language and age at the time of the event and by the main agent in the narrative. It is proposed that memories and self-narratives in bilinguals are mediated by the language spoken at any given time and that language functions as a vehicle for culture, with cultural differences seeping into language and influencing cognitive styles and the self.

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“-Should you marry him? the question comes in English.
-Yes.
-Should you marry him? the question echoes in Polish.
-No.
-Should you become a pianist? the question comes in English.
-No, you mustn't. You can't.
-Should you become a pianist? the question echoes in Polish.
-Yes, you must. At all costs.”
(Hoffman, 1989, p. 199).

The relationship between language and thought has been studied most frequently through the prism of the Sapir-Whorf Hypothesis (Whorf, 1956; see Gentner & Goldin-Meadow, 2003, for recent discussions). In its

broader form, the Sapir-Whorf hypothesis proposes that the language we speak may influence the way we see the world, the way we cut out ‘reality’ around us, the way we see action (e.g., Gentner, 1982), entities (e.g., Boroditsky, in press; Boroditsky, Schmidt, & Phillips, 2003), and other people (e.g., Asuti, 1995). The present study proposes that the language we speak influences not only the way we see the world around us, but also the way we see and think about ourselves—our self-perception, identity, autobiographical life narrative, in sum, our *self*. One may think and feel differently when speaking two languages; decisions may be reached in a different manner and factors may be weighed differently depending upon the language spoken at a given time and the culture to which that language is tied.

The idea that self-construal may vary across cultures finds support in cross-cultural research with monolingual speakers (e.g., Bagozzi, Wong, & Yi, 1999; Kitayama, Markus, & Kurokawa, 2000; Markus & Kitayama,

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1991; Matsumoto et al., 2002; Oyserman, Coon, & Kemmelmeier, 2002; Schimmack, Oishi, & Diener, 2002). Moreover, differences in self-identity measures such as self-esteem, self-descriptions, and cultural views were reported by bicultural Chinese-English bilinguals depending upon the language in which scales were administered (Ross, Xun, & Wilson, 2002). For bilinguals' autobiographical memory, research has revealed different patterns of memory retrieval depending upon the language in which memories are being accessed (e.g., Conway, 2003; Javier, Barroso, & Munoz, 1993; Koven, 1998, 2001; Larsen, Schrauf, Fromholt, & Rubin, 2002; Marian & Neisser, 2000; Otoy, 1987; Schrauf, 2000; Schrauf & Rubin, 1998, 2000, 2001, in press). Consistent with Ross et al. (2002), we propose that differences in self-construal can be found not only across two different groups (e.g., Markus & Kitayama, 1991), but also within the same group if that group consists of bicultural bilinguals. Specifically, in the present study, we predicted that language mediates self-construal in bilinguals and that bilinguals' narratives are more individualistic when speaking a language associated with an individualistic culture and more collectivist when speaking a language associated with a collectivist culture.

Individualism and collectivism measures reflect the extent to which the self is defined in relation to others (e.g., Gardner, Gabriel, & Lee, 1999; Triandis, 1995). Individualism is associated with Western cultures, where the locus of behavior is thought to lie in attributes of the person, such as attitudes, preferences and motives (e.g., Choi, Nisbett, & Norenzayan, 1999), and the self is defined as an autonomous and unique individual. Collectivism is associated with Eastern cultures, where an individual is seen as an entity embedded within a larger social structure, and where behavior is explained by interactions between the individual and the society. Individualism and collectivism are viewed by some as two opposite ends of a continuum (Hofstede, 1984), while others see them as separate dimensions that can coexist (Schwartz, 1990; Triandis, 1995; Triandis & Gelfand, 1998).

In the cross-cultural psychology literature, United States has been classified as an example of an individualistic culture (e.g., Hofstede, 1980) and Russia has been classified as a collectivist culture (e.g., Triandis, 1995). Multiple large-scale surveys conducted during the last two decades in the former Soviet Union confirmed that the Russian culture was more collectivistic than the American culture (e.g., Chirkov, Ryan, Kim, & Kaplan, 2003; Diener, Gohm, Suh, & Oishi, 2000; Hofstede, 2001; Realo & Allik, 1999). Even during the transition from Communism to the more democratic form of government that it is enjoying today, Russia has retained its preference for the collective forms of organization (Wergen, 1994). Political scientists have noted that during the Soviet years collectivism "became part of

Soviet ideology" (Williams, 1980), where "Not 'I' but 'we,' ... is the principle on which the personality should be freed." (Gorky, 1918; cf., Williams, 1980).¹

The participants in the present study were Russian-English bicultural bilinguals, born in the former Soviet Union, who immigrated to the United States in their teens and were students at an American university at the time of testing. For these Russian-English bilinguals, Russian was associated with the culture of the former Soviet Union, and English was associated with the culture of the United States. We predicted that bicultural Russian-English bilinguals would have a more individualistic self-concept when speaking English than when speaking Russian, and a more collectivist self-concept when speaking Russian than when speaking English. Autobiographical life narratives were collected and compared along a number of dimensions intended to capture the linguistic correlates of individualism and collectivism, including content measures such as the main agent in the narrative (self—individualistic, others—collectivist) and linguistic measures such as first-person singular pronouns (individualism measure) and first-person plural pronouns (collectivism measure). Use of personal pronouns to measure individualism—collectivism is motivated by research suggesting that use of pronouns in language contributes to identity negotiation and construction of social reality (Mulhauser & Harre, 1990), that self-construal in discourse is sensitive to use of pronouns like "I" as index of an independent, autonomous self and "we" as index of an interdependent, contextually defined self (Pillsbury, 1998), and that first-person pronouns can serve as effective primes for independent and inter-dependent self-construal (e.g., Brewer & Gardner, 1996; Gardner et al., 1999). Kashima and Kashima (1998) conducted a linguistic analysis on the use of pronouns in 39 languages spoken in 71 cultures and found that the number of first-person pronouns in a language correlates with a country's scores on scales of intellectual autonomy and affective autonomy, both of which are characteristic of individualistic cultures, and that cultures with pronoun drop languages tend to be less individualistic than cultures with non-pronoun drop languages.

In addition to self-construal, we also examined the effect of individualism—collectivism on emotional valence in bicultural bilinguals. Support for the idea that emotional valence varies across individualistic and col-

¹ However, some political science theorists suggest that the United States is stronger in social capital (an informal norm that promotes cooperation between two or more individuals) than a country such as Russia (Fukuyama, 1995, 1999), with an open debate on whether growing individualism leads to destruction of social capital (e.g., Coleman, 1988) or whether individualism correlates positively with social capital (e.g., Allik & Realo, 2004).

lectivist cultures comes from a meta-analysis by Basabe et al. (2002), who found that individualism correlates positively with affect balance and subjective well-being. For example, individualism correlates negatively with depression (e.g., Sastry & Ross, 1998), as well as with social anxiety (e.g., Dinnel & Kleinknecht, 1999; Kleinknecht, Dinnel, Kleinknecht, Hiruma, & Harada, 1997). Kitayama et al. (2000) found that frequency of positive emotions was associated with interpersonally engaged emotions for Japanese students, but with interpersonally *disengaged* emotions for American students.² We examined the emotional valence of autobiographical narratives produced by bicultural bilinguals, predicting that memories associated with a collectivist culture would be more negative than memories associated with an individualistic culture. To ensure that the positive–negative valence of memories was influenced by individualism–collectivism, as opposed to differences in economic well-being associated with Russian and American cultures, emotional valence of memories was analyzed not only by language of encoding, but also by main agent ratings.

Another measure of emotion, in addition to valence, is intensity. Previous studies on emotional intensity in bilinguals have been inconclusive and it remains unclear whether intensity is expressed differently in the first and the second languages. While some researchers find that the native language carries more emotional intensity than the second language (e.g., Bond & Lai, 1986; Chacon, 1995; Gonzalez-Reigosa, 1976), others find no differences across the two languages (e.g., Lubin, Natalicio, & Seever, 1985; Pizarro, 1995). The issue is further complicated by findings such as those that English-Spanish bilinguals and Spanish-English bilinguals express more affect when speaking Spanish, irrespective of whether it is their native or second language (Guttfreund, 1990). Once a taxonomy of emotion words is taken into account (Ortony, Clore, & Foss, 1987), it becomes clear that methodological differences in measuring affect are likely to account for some variability in findings. Although the exact pattern continues to be debated, language choice does appear to influence accessibility of memories and of their emotional qualities in both clinical and experimental studies (for a review, see Schrauf, 2000), so that some memories become more accessible or carry higher intensity when accessed in one language, compared to the other. To account for such differences, Marian and Neisser (2000) proposed the

language-dependent memory hypothesis. Based on the encoding specificity principle (Tulving & Thomson, 1973), the language-dependent memory hypothesis suggests that accessibility of memories is influenced by the match between languages of encoding and retrieval, so that memories become more accessible when the language of retrieval corresponds to the language in which the memories were originally encoded. Thus, for the present study, we found it more productive to examine the emotional intensity of bilingual autobiographical memories within the context of language-dependent memory. We predicted that the match between the language spoken at the time of retrieval and the language spoken at the time of encoding would influence emotional intensity in bilinguals' autobiographical memories. Specifically, autobiographical memories were expected to be rated higher in intensity when the language of retrieval matched the language in which the event originally took place than when it did not. This idea is supported by empirical findings such as richer and more elaborate memories when accessed in the language of encoding (e.g., Javier et al., 1993), by applied research with bilinguals that suggests that effectiveness of services such as psychotherapy and counseling vary across languages (e.g., Aragno & Schlachet, 1996; Marcos, 1976; Oquendo, 1996; Santiago-Rivera & Altarriba, 2002), and by anecdotal and literary accounts: "*Nabokov taught us by example that one way out of the trap of nostalgia is another language, where words have no intimate connection with the wounded creature of the past*" (Medina, 2002, p. 3).

The work presented here is part of an on-going study in which autobiographical memories of Russian-English bilinguals are examined (Marian, Kaushanskaya, & Fausey, 2003; Marian & Neisser, 2000). Collecting autobiographical narratives in a naturalistic setting carries the advantages of ecological validity and has relevance to everyday memory phenomena in the real world (Neisser, 1978, 1991). For example, life narratives are known to vary across contexts (e.g., Bruner, 1986), making them well-suited for studying the flexibility of the self across bilinguals' languages. Moreover, for emotion, naturalistic narratives do not restrict a bilingual's array of possible choices, and, compared to forced-choice tasks such as choosing among a list of labels to describe emotion, do not limit the cultural connotations that a label in another language may carry (Altarriba, Basnight, & Canary, 2003).

In sum, the objectives of the present study were to examine the effect of language on self-construal and emotional expression in bilinguals. We predicted that language of retrieval, language of encoding, and the interaction between the two, influence measures of individualism–collectivism, emotional intensity and valence in bicultural bilinguals. The within-group comparison makes it possible to examine coexistence of

² However, in addition to cultural differences in Individualism–Collectivism, it has been suggested that the between-group differences reported for affect may be a result of linguistic differences (e.g., Semin, Gorts, Nandram, & Semin-Goossens, 2002), philosophical differences (e.g., Schimmack et al., 2002), and economic well-being (e.g., Hofstede, 1980; Oyserman et al., 2002).

multiple frames of reference and self-schemas in the same individual, and the role that language may play in negotiating the two identities across cultures.

Method

Participants

Forty-seven Russian-English bilinguals, 23 males and 24 females were tested. 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). 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%).

Two independent raters rated bilinguals' proficiency and accent; disagreements were discussed until a consensus was reached. Proficiency was rated on a scale from 1 to 5, with 1 being very low proficiency (including poor grammar, limited vocabulary, and minimal fluency), and 5 being very high proficiency (including native-like grammar, complex sentences, extensive, and diverse vocabulary, use of figurative language, and high fluency). Accent was rated on a scale of 1 to 5, with 1 referring to very heavy accent and poor intelligibility, and 5 referring to no perceivable accent and native-like pronunciation. Coders also counted instances of disfluency (such as repetitions of words and syllables, pauses, interjections like 'uhmm,' 'well,' etc.) and computed proportions by dividing the number of disfluencies by total number of words in a narrative. The first coder for all English and Russian narratives was a Speech-Language Pathologist who was bilingual in Russian and English. The second coder for English narratives was a research assistant who was a monolingual native English speaker; the second coder for Russian narratives was another Russian-English bilingual Speech-Language Pathologist.

Results suggest that bilinguals were more proficient in Russian (mean = 3.98, $SE = .67$) than in English (mean = 3.43; $SE = .69$), paired-sample $t(46) = 3.33$, $p < .01$, had a heavier accent when speaking English (mean = 2.77, $SE = .66$) than when speaking Russian (mean = 1.28, $SE = .29$), paired-samples $t(46) = 9.11$, $p < .01$, and produced more disfluencies in English (mean = 0.098, $SE = .02$) than in Russian (mean = 0.05, $SE = .02$), paired-sample $t(46) = 5.97$, $p < .01$. Proficiency, accent ratings, and disfluency results suggest that the participants in this study were more proficient in Russian, their first language, than in English, their second language. Pearson r correlation analyses did not reveal significant relationships between self-reported language preference and independent raters' judgments

of proficiency ($r = .10$ for English and $r = .04$ for Russian), accent ($r = -.13$ for English and $r = -.10$ for Russian), or disfluency ($r = .16$ for English and $r = .04$ for Russian), suggesting that self-reported language preference was not a reliable index of actual linguistic performance.

Design and procedure

Participants were interviewed individually; all interviews were tape-recorded. Each interview consisted of two parts, an English part and a Russian part, with the order of languages counterbalanced across participants. The experimenter and the participant spoke only in the language appropriate for that part; the participant was explicitly instructed to not switch into the other language. The cue word technique was used and sixteen Russian-English pairs of prompt words were selected, so that each member of a pair was the direct translation of the other. The cue word technique is the traditional method used to probe autobiographical memories (e.g., Bugelski, 1977; Crovitz & Schiffman, 1974; Galton, 1879; Otoy, 1987; Robinson, 1976; Schrauf & Rubin, 1998, in press, 2003). The following sixteen cue words and their Russian translations were used: Summer, neighbors, birthday, cat, doctor, getting lost, frightened, bride, snow, friends, holiday, dog, blood, contest, laughing, and newborn. These cue words were selected as a result of piloting (with monolingual English speakers and bilingual Russian-English speakers) aimed at establishing effective cue words for eliciting autobiographical narratives (Marian & Neisser, 2000). Participants were asked to describe an event from their life that a particular prompt brought to mind. They were encouraged to respond as quickly as possible and to tell the first story that they thought of when they heard the prompt. Each prompt word was presented to a participant only once, with half of the prompt words presented in one language and half in the other. Although participants were not specifically instructed to avoid repeating the same narrative in both languages, the use of different cues across languages prevented that from happening. Language of the prompts and order of presentation (Russian first or English first) were counterbalanced across participants.

After all memories had been recorded, participants were asked to indicate their age and the language used at the time of each event. Memories were coded as Russian at encoding, English at encoding, or Mixed Russian and English at encoding, depending upon where the memories were encoded (e.g., USA or Russia) and who else was present at the time of the event (monolingual Russian speakers, monolingual English speakers, bilingual Russian-English speakers, both monolingual Russian and monolingual English speakers).

The study followed a 2×3 Repeated Measures factorial design, with Language of Retrieval (Russian or English) and Language of Encoding (Russian, English, or Mixed) as the two within-subject independent variables. Narratives were coded on five dependent variables—proportion of personal pronouns, proportion of group pronouns, main agent of the narrative, emotional intensity, and positive to negative emotional valence. Variables that were word-count related (personal pronouns and group pronouns) were controlled for narrative length (ratio relative to total word count). Proficiency was included as a covariate when appropriate.

Coding and analyses

The first construct measured was Individualism/Collectivism, operationally defined by three dependent variables—proportion of personal pronouns, proportion of group pronouns, and main agent in a narrative. Personal pronouns were defined as all first-person singular pronouns: *I*, *me*, *my*, and *mine*. Group pronouns were defined as all first-person plural pronouns: *We*, *us*, *our*, and *ours*. The proportion of personal or group pronouns was computed out of the total number of words in a narrative. For main agent ratings, a narrative was rated as 1 when it described a completely self-oriented, personal memory, with only the speaker involved in the event. A rating of 2 was given to a memory where the speaker was the primary actor, but with other participants also involved. A rating of 3 was given to group memories, where the speaker and other participants were involved in the event to an approximately equal extent. A rating of 4 was given to narratives where the speaker was only marginally involved, with other participants being the main actors, and a rating of 5 was given to completely others-oriented memories, where the narrative described events in which only other participants were involved, without the speaker.

The second construct measured was Emotion, operationally defined by two dependent variables: emotional intensity, and emotional valence of the memory. Intensity was rated on a scale from 1 (no emotion) to 6 (extremely high intensity). Valence was rated on a scale from 1 (narratives that expressed completely negative affect) to 7 (narratives that expressed completely positive affect), with a rating of 4 given to memories that were equally negative and positive.

Two raters coded all narratives together; one of the two raters was blind to the hypotheses tested. Disagreements were discussed until consensus was reached for 100% agreement using point-to-point reliability. In addition, a third rater, blind to the hypotheses tested, coded 10% of all data independently. Point-to-point reliability between the third coder and the two original coders was 90%.

To prepare data for repeated-measures analyses, means per subject were computed for dependent variables in each of the four conditions: encoded in Russian/retrieved in Russian, encoded in Russian/retrieved in English, encoded in English/retrieved in Russian, Encoded in English/retrieved in English. Two types of analyses were run in order to determine whether the number of personal pronouns, number of group pronouns, and main agent ratings differed depending upon language of retrieval. First, for each dependent variable, a two-way repeated-measures ANCOVA by language of retrieval (Russian or English) and language of encoding (Russian or English), controlled for total word count and with proficiency as a covariate, were performed. Mixed memories were excluded from this analysis, because including mixed memories in a repeated-measures comparison resulted in too many missing values, rendering the analysis impossible. Next, for each dependent variable, data were analyzed using a one-way repeated-measures ANCOVA, with language of retrieval as an independent variable, and proficiency as a covariate. For this analysis, Russian-encoded, English-encoded, and Mixed-encoded narratives were collapsed across the language of interview. Results from both ANCOVAs are reported. The two-way ANCOVA is reported because it includes Language at Encoding as an independent variable, controlling for a possible confound of memory content. The one-way ANCOVA is reported because it made it possible to keep all participants in the analyses,³ as well as to include mixed memories.

Results

A total of 752 narratives were analyzed; half of them were narratives retrieved in English and half were narratives retrieved in Russian. Of these, 399 memories were encoded in Russian, 196 memories were encoded in English, 109 memories were encoded in a Mixed Russian and English linguistic environment, and 48 memories lacked language of encoding data. Table 1 shows the distribution of memories across language combinations.

³ The large number of missing cases in the two-way ANCOVAs is due to the fact that not all participants provided memories for each of the four cells (Encoded in Russian/Retrieved in Russian; Encoded in Russian/Retrieved in English; Encoded in English/Retrieved in Russian; Encoded in English/Retrieved in English). In repeated-measures comparisons, if at least one of the four cells is missing data, all data from that participant are eliminated. The high number of participants dropped from these analyses led to conducting one-way ANOVAs.

Table 1
Distribution of memories across language of encoding and retrieval combinations

Language at encoding	Language at retrieval		Total
	Russian	English	
Russian	238	161	399
English	63	133	196
Mixed Russian and English	51	58	109
Not available	24	24	48
Total	376	376	752

Individualism/collectivism

The proportion of group and personal pronouns (out of total word count in a narrative) were analyzed using two-way repeated-measures ANCOVAs with language of interview (Russian or English) and language of encoding (Russian or English) as independent variables and with proficiency as a covariate. Results are illustrated in Fig. 1 and show a main effect of language of retrieval, with bilinguals using more personal pronouns when narrating life stories in English ($M = 0.09$, $SE = .005$) than in Russian ($M = 0.08$, $SE = .005$), $F(1, 24) = 6.87$, $p < .05$. No effect of language of encoding and no interaction between language of retrieval and language of encoding were observed. Similarly, bilinguals used more group pronouns when narrating autobiographical events in Russian ($M = 0.02$, $SE = .003$) than in English ($M = 0.01$, $SE = .002$), $F(1, 24) = 3.93$, $p < .05$ (see Fig. 2). No significant main effect for language of encoding and no interaction were observed.

The high proportion of missing cases in the two-way ANCOVA suggests that performing a one-way ANCOVA on the variable that produced a significant main effect is a valuable procedure in ensuring that the results are valid for the entire sample of participants. The one-way repeated-measures ANCOVAs with profi-

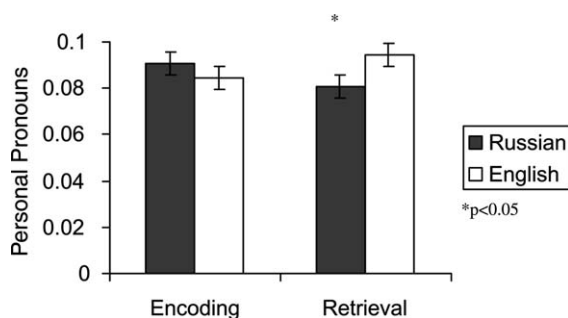


Fig. 1. Mean proportion of personal pronouns (number of personal pronouns divided by total word count) in Russian and English narratives.

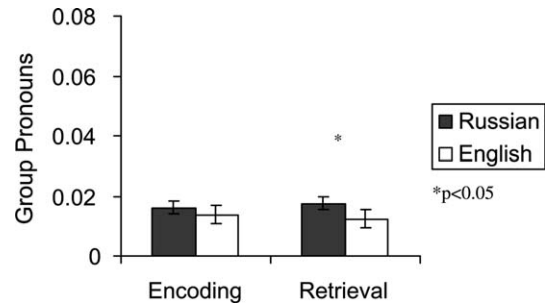


Fig. 2. Mean proportion of group pronouns (number of group pronouns divided by total word count) in Russian and English narratives.

ciency as covariate reinforced the results of the two-way ANCOVAs. Bilinguals used more personal pronouns when narrating life stories in English ($M = 0.009$, $SE = .002$) than when narrating life stories in Russian ($M = 0.008$, $SE = .003$), $F(1, 45) = 8.71$, $p < .01$, and more group pronouns when narrating autobiographical events in Russian ($M = 0.03$, $SE = .001$) than in English ($M = 0.02$, $SE = .001$), $F(1, 45) = 4.78$, $p < .05$.

Across all narratives, 195 narratives were rated as events in which the speaker alone was involved, 226 narratives were rated as events in which the speaker was the primary actor, with other participants involved to a lesser extent, 212 narratives were rated as events in which the speaker and other participants were involved about equally, 78 narratives were rated as events in which other participants were main actors and the speaker was involved to a lesser extent, and 41 narratives were rated as events in which only others were involved, without the speaker. Analyses on the main agent in a narrative did not need to be controlled for total word count or proficiency. In these analyses, we included a third independent variable, gender, to explore the hypothesis that males and females differ in expressing the main agent of a narrative. A three-way ANOVA, with language at retrieval and language at encoding as within-subject variables and gender as a between-subject variable, was performed. As shown in Fig. 3, results revealed a main effect of language of retrieval, with bilinguals producing more self-oriented narratives when the language at retrieval was English ($M = 2.04$, $SE = .09$) than when it was Russian ($M = 2.41$, $SE = .14$), $F(1, 24) = 6.44$, $p < .05$, and a main effect of gender, with men producing narratives that were more self-oriented ($M = 2.05$, $SE = .11$) than those produced by women ($M = 2.44$, $SE = .12$), $F(1, 24) = 5.88$, $p < .05$. No effect of language of encoding, and no interactions among variables were observed. A one-way ANCOVA including data from all 47 participants confirmed these results. The main agent was more self-oriented in English narratives ($M = 2.20$, $SE = .14$) than in

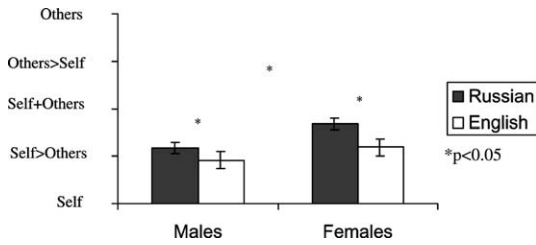


Fig. 3. Mean rating of agent in Russian and English narratives of males and females, with (1) the individual being the sole agent in a story, (2) the individual being the primary agent in a story with others in the periphery, (3) the individual and others equally involved as a group, (4) others being the primary agents in a story with the individual in the periphery, and (5) others being the sole agents in a story.

Russian narratives ($M = 2.48$, $SE = .15$), $F(1,46) = 20.57$, $p < .01$.

In addition to language of encoding, separate analyses were performed on age at the time of encoding each memory, to control for age as a possible confounding factor. Because each memory is associated with a different age of encoding, the focus (and degrees of freedom) in these analyses shifted from the participant as the unit of analysis to the memory as the unit of analysis. Two-way ANCOVAs with age at the time of encoding and language at retrieval as independent variables, and proficiency as covariate, did not reveal a significant effect of age on retrieval of personal pronouns ($F(3,697) = 0.56$, $p = .45$), group pronouns ($F(3,697) = 0.94$, $p = .61$), or main agent, ($F(1,699) = 0.05$, $p = .83$).

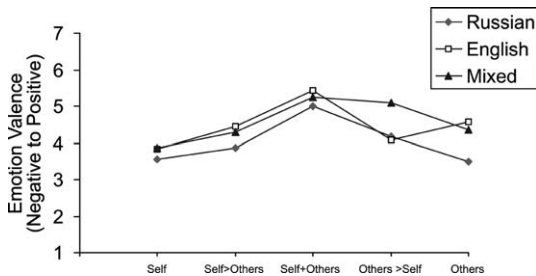


Fig. 4. Mean affect valence on a scale from 1 (completely negative) to 7 (completely positive) for memories encoded in Russian, English, or both, as a function of main agent in the story.

Emotion

Emotional intensity differences across languages were analyzed using a two-way repeated-measures ANCOVA with language of retrieval (Russian or English) and language of encoding (Russian or English) as independent variables. Results revealed no main effect of language at encoding or language at retrieval, but a significant interaction between the two, $F(1,25) = 5.845$, $p < .05$. A post-hoc paired sample t test with match/mismatch between languages of encoding and retrieval as the independent variable and emotional intensity as the dependent variable revealed that participants produced narratives that were more emotionally intense when the language of encoding and language of retrieval matched ($M = 3.01$, $SE = .09$) than when they did not match ($M = 2.76$, $SE = .11$), $t(43) = 2.83$, $p < .01$.

A 3-way ANOVA for each memory, with language of retrieval, language of encoding, and main agent as independent variables, and emotional valence as the dependent variable was performed. In these analyses, data were not partitioned by participants (making the participant the unit of analysis would result in an impossible-to-run $2 \times 2 \times 5$ repeated-measures design with 20 conditions); instead, the individual memory was selected as the unit of analysis. Results revealed a main effect of agent, $F(4,673) = 10.30$, $p < .01$ and a main effect of language of encoding, $F(1,673) = 3.20$, $p < .05$, but no effect of language of retrieval (see Fig. 4). That is, bilinguals' memories were reported as more positive when the main agent in the memory was others- or group-oriented than when it was the individual self. Moreover, language at the time of event influenced valence, so that memories encoded in Russian were least positive ($M = 4.01$, $SE = .14$), compared to memories encoded in English ($M = 4.47$, $SE = .19$) or in a mixed Russian and English environment ($M = 4.57$, $SE = .21$), with the latter reported as most positive.

Pairwise Pearson correlations were computed to examine the relationship between the emotional valence of memory and age at the time of event, language of encoding, language of retrieval, and main agent (see Table 2). The correlations between emotional valence of memory and main agent ratings ($r = .17$, $p < .001$) and between emotional valence of memory and age at the

Table 2

Pairwise Pearson correlations (r) between age at memory, language of encoding, language of retrieval, main agent, and valence rating for each memory ($N = 752$)

	Valence rating	Main agent	Language of retrieval	Language of encoding
Age at memory	0.14	0.01	0.15	0.61
Language of encoding	0.08	0.00	0.16	—
Language of retrieval	0.02	0.13	—	—
Main agent	0.17	—	—	—

time of event ($r = .14$, $p < .001$) support the results of the 3-way ANOVA and suggest a tendency for memories encoded later in life to be rated as more positive than memories encoded earlier in life and for other-oriented memories to be rated more positive than self-oriented memories. Age at time of event and language at encoding correlated highly (Pearson $r = .61$, $p < .0001$), with earlier memories more likely to be encoded in Russian and later memories more likely to be encoded in English, making it difficult to disentangle the two variables.

Self-reported language preference

To examine whether bilinguals' self-reported language preference (Russian, English, or None) influenced performance, data were analyzed using a two-way ANOVA with self-reported language preference as a between-subjects variable and language of retrieval as a within-subjects variable. No significant effect of self-reported language preference was observed for proportion of personal pronouns ($F(2, 44) = 1.38$, $p > .1$), proportion of group pronouns ($F(2, 44) = 0.23$, $p > .1$), main agent ratings ($F(2, 44) = 0.46$, $p > .1$), emotional intensity ($F(2, 44) = 0.81$, $p > .1$), or affect ($F(2, 44) = 0.11$, $p > .1$). Adding language of encoding as a third independent variable in the Analyses of Variance did not change the pattern of findings for measures of individualism–collectivism, but resulted in a three-way interaction for emotional intensity ($F(2, 23) = 3.51$, $p < .05$) and for affect ($F(2, 23) = 6.53$, $p < .05$). Note, however, the decrease in sample size from which data for these comparisons could be drawn. Post-hoc analyses revealed that, for emotional intensity, bilinguals who reported no language preference between Russian and English showed stronger emotional intensity when the languages of retrieval and encoding matched than when they mismatched ($F(1, 6) = 18.87$, $p < .05$); no differences were observed for bilinguals who preferred one language over the other. For affect, bilinguals whose self-reported language preference was English reported more positive memories when languages of encoding and retrieval matched than when they mismatched ($F(1, 9) = 8.39$, $p < .05$); no differences were observed for bilinguals whose self-reported language preference was Russian or who did not have a preference.

Discussion

The interplay among language, memory, emotion, and self can be incorporated into multiple theoretical frameworks (for examples, see Neisser & Fivush, 1994). The present study used the context of bilinguals' memory to examine the interaction among language, self-construal and emotion along dimensions such as individualism–

collectivism, emotion valence and intensity. With respect to individualism–collectivism, we used both a linguistic measure, namely the number of personal and group pronouns, and a measure independent of language, namely the main agent in a story. For the content measure used, results revealed that English narratives were more self-oriented than Russian narratives and Russian narratives were more other-oriented than English narratives. For the linguistic measures used, Russian-English bilinguals used more personal pronouns when speaking English than when speaking Russian and more group pronouns when speaking Russian than when speaking English, even when narrative length, and proficiency in the two languages were taken into account. Differences in the use of first-person singular and first-person plural pronouns in narratives may be indicative of differences in self-construal and cultural values. Consider, for example, that both Russian and English allow one to say either “Our family went. . .” or “My family and I went. . .” (in Russian the respective forms are “Nasha semya poshla. . .” and “Ja s semyoy poshel. . .”). However, in the narratives collected in the present study the tendency was to use the former version when speaking Russian, but the latter version when speaking English. Thus, in English, the emphasis was placed on the individual, with other people included as they relate to the individual. In Russian, the emphasis was placed on the group, with the individual included as s/he relates to the group.

These results suggest that a bilingual's language may influence cognitive styles, so that speaking English, a language associated with a more individualistic culture, results in a more individualistic self-construal, whereas speaking Russian, a language associated with a more collectivist culture, results in a more collectivist self-construal. We propose that the bilingual self is mediated by the language spoken at any given time and that language functions as a vehicle for culture with cultural differences seeping into language and potentially influencing cognitive styles and the self. Our findings are consistent with results of several cross-cultural studies on the self (e.g., Markus & Kitayama, 1991; Triandis, 1989) and suggest that differences in self-construal can be found not only in cross-cultural comparisons, but also within groups that have been socialized in different cultures. Future work may be able to separate the influence of culture and language by testing the two variables independently (e.g., bicultural monolinguals or monocultural bilinguals), by focusing more specifically on memories encoded in Russian after arrival to the United States, or by manipulating language of encoding in laboratory setting while maintaining cultural context. It may also be interesting to consider whether the differences reported in the present study would generalize to on-line processing tasks (such as, for example, whether bilinguals' text processing is influenced by presence of pronouns) to further examine whether these

differences are a category of demand characteristics associated with the different languages/cultures, or whether they genuinely reflect differences in processing and understanding.

In fact, because demand characteristics influence self-presentation, the distinction between self-concept and self-presentation is a necessary one to consider. On the one hand, because Russian and American cultures may differ in how people are encouraged to present themselves, it is possible that it is not the self-concept per se that is differentially affected by these cultures, but rather self-presentation, the way one represents oneself to the outside world. On the other hand, evidence suggests that the way one presents oneself to the outside world ultimately influences the way one perceives oneself internally (e.g., Schlenker, Dlugolecki, & Doherty, 1994; for reviews, see Leary & Tangney, 2002) and, to that extent, the distinction between self-presentation and self-concept becomes blurry. Studies have shown that the way individuals talk about themselves and about personal experiences influences the way they remember events, with the past continuously rewritten to accommodate self-construal and with self-construal frequently altered to accommodate memory (for a review, see Wilson & Ross, 2003). It is within this framework that self-construal is influenced and, in turn, influences, the way we tell stories about our personal life experiences, with both self-construal and autobiographical narrative influenced by language and culture.

Gender differences in autobiographical memory styles have been reported in a number of studies of episodic memory (e.g., Pillemer, Wink, DiDonato, & Sanborn, 2003; Siedlitz & Diener, 1998). Although we did not set out to examine gender, observations along the way led us to include gender as a possible factor in analyses of bilinguals' narratives. Gender was found to influence narrative styles, so that men produced narratives in which the main agent was more likely to be self-oriented than in the narratives produced by women. This finding suggests that the self may be more interdependent in women than in men, and is consistent with previous research on gender differences in self-construal (for a review, see Cross & Madson, 1997).

When emotion representation was examined, autobiographical memories were found to be higher in emotional intensity when the languages of encoding and retrieval matched than when they did not match. The idea that emotion is strengthened by a reinstatement of encoding language at the time of retrieval carries applied implications for services to bilingual clients, such as psychotherapy. It is consistent with the hypothesis of language-dependent memory (Marian & Neisser, 2000) and suggests that language functions similarly to other types of context (e.g., Davies & Thomson, 1988), so that reinstating language of encoding at retrieval influences memory. The results of the present study expand the

hypothesis of language-dependent memory to include memory qualities such as emotion, specifically emotional intensity. Future work in this area may contribute to a better theoretical understanding of the relationship between emotion and language in memory, within the bilingual context and outside of it, and the role of emotional associations in language.

Memories encoded in Russian were rated as less positive than memories encoded in English; this result is consistent with findings of more intense and positive emotion in individualistic than in collectivist cultures (Basabe et al., 2002; Matsumoto, 1989), but may also be a result of other differences across the two cultures (such as, for example, economic well-being). At the same time, bilinguals' memories were reported as more positive when the main agent in the memory was other- or group-oriented than when it was self-oriented. The finding that for these participants, more positive emotions are associated with group memories, while more negative emotions are associated with self-oriented memories suggests that bicultural Russian-English bilinguals may have a highly developed interpersonal self, where interactions with others are valued and carry positive connotations. This, together with the fact that mixed memories (i.e., memories that were encoded in a combination of Russian and English) were rated as most positive, suggests that the self of bicultural Russian-English bilinguals is integrated across cultures and that an amalgam of both cultures results in the most positive affect, a finding that is consistent with reported psychological benefits of biculturalism (e.g., Berry, 1998; LaFromboise, Coleman, & Gerton, 1993).

Although language at the time of encoding was found to influence affect, the strong correlation between language at encoding and age at encoding makes it impossible to attribute the effect to one of the two. On the one hand, it is possible that chronological age at the time of event influences affect, with memories from a younger age more negative than memories from a later age. On the other hand, it is possible that cultural factors drive the effect, with memories encoded in Russian and heavily loaded with Russian culture more negative than memories encoded in English and heavily loaded with American culture. Further research is needed to determine whether this is an artifact of actual cross-cultural differences in life satisfaction (due, for example, to differences in economic wellbeing), or an artifact of post-immigration rationalization. It is possible, for example, that (a) the quality of life associated with Russian culture produced less positive memories in general, that (b) the group of people more likely to have negative experiences with the Russian culture is also the group of people more likely to immigrate, and (c) that immigrants reconstruct their life narrative in a way in which the decision to immigrate is reconciled in light of the remembered life experiences, so that Russian memories

are reconstructed as more negative. Future research may be able to disentangle the effects of chronological age and language/culture of encoding.

Finally, self-reported language preference did not correlate significantly with proficiency, accent, or number of disfluencies, as rated by independent coders, nor did it have a significant effect on narrative data. Although independent judges rated this group as Russian-dominant, the majority of bilinguals tested reported preferring English to Russian. This suggested that, in terms of linguistic performance, self-reported measures of language preference were not a reliable measure of language proficiency/dominance for this particular group of bilinguals. Factors other than proficiency may be influencing self-reported language preference, such as the desire to fit in the culture of the adopted country and the prestige that immigrant Russian communities associate with speaking English well. The findings that, when languages of encoding and retrieval matched, bilinguals with no language preference (but not those who preferred one language over the other) had more intense memories and bilinguals who preferred English (but not the other two groups) had more positive memories should be interpreted with caution, as they may be an artifact of the low number of participants included in these analyses. (For instance, only 11 of the 26 bilinguals whose preferred language was English could be included in the 3-way ANOVA.)

Controlling bilinguals' linguistic and socio-cultural background is essential in future research considering the interplay between language, culture, cognition, and the self in bilinguals. It is possible that factors such as testing context, context in which bilinguals use their two languages, native language, native culture, etc., mediate the effects of first versus second language on individualism/collectivism, and emotion. For instance, for the bilinguals tested in the present study, Russian is used primarily for family interactions, English is used as the primary language outside the home (including academic and work settings), and the mixture of the two is usually used in interactions with other bilingual speakers. Future studies may focus on testing bilinguals who use their two languages differently across settings, bilinguals for whom the individualism–collectivism dimension is not as salient or is reversed across first and second languages, or even monolingual speakers across cultures.

The present study suggests that the language a bilingual speaks influences his or her take on the world and on one's place in it. It contributes to our understanding of how multiple cognitive perspectives and mental models co-exist within one mind and the role language may play in this process. The coexistence of multiple selves and emotional states within the same individual and differential manifestation of these selves once expressed linguistically can be illustrated metaphorically by the quantum superposition of Schrodinger's cat (Yam,

1997). Just like multiple physical states can coexist simultaneously at the subatomic level and a physicist can not know what a given state will be until a measurement is made, just like thought can be viewed as probabilistic (Spivey, to appear), so do multiple internal states coexist until expressed in a particular way. One need not be bilingual to have such a 'quantum self'; language is but one way to tap into the superposition of the self.

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