Bilingual analysis of LOVE and HATRED emotional markers  
(SPSS-based approach) 

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Abstract  

This paper presents the results of GRID project which aimed at studying the semantics of 24 emotion terms in 23 languages belonging to 8 language families (Indo-European, Indo-Iranian, Afro-Asiatic, Altaic, Uralic, Japonic, Sino-Tibetan, Niger-Congo, and Unclassified). We limit ourselves in this article only to two Slavic languages – Slovak and Czech and to two emotion terms – love and hatred – and try show how greatly information technologies helped the psychologists first of all to obtain, and then to process large volume of information from a bit less than 5000 people, active project participants, who live in 30 countries.

1 Credits  

Though two languages are discussed in the paper, it is written by teachers of Faculty of Mass Media Communication, University of SS Cyril and Methodius in Trnava, Slovakia: by prof. Nataliya Panasenko, assoc. prof. Slavomír Magál, Dr. Dana Petranová and Dr. Andrej Trnka.

2 Introduction  

Feelings and emotions are important components of human cognitive activity, behaviour, communication with the world and other people. Human emotional sphere has been thoroughly analyzed by psychologists, philosophers, and linguists.
tion or appraisal of the event, features describing the bodily symptoms that tend to occur during the emotional state (felt shivers in the neck or chest, got pale, felt his/her heartbeat slowing down, felt his/her heartbeat getting faster, felt his/her breathing getting faster, perspired, or had moist hands); features describing facial and vocal expressions, that accompany the emotion (blushed, smiled, felt his/her jaw drop, pressed his/her lips together, felt his/her eyebrows go up, frowned, closed his/her eyes, had tears in his/her eyes; changes in the loudness of voice, of speech melody, speech tempo, speech disturbances, etc.). All these symptoms are included into GRID project, results of which we present in our paper.

3 GRID project

The International GRID Research Consortium was founded in 2005 to organize a world-wide study of the semantics of emotion terms in different languages (French, Italian, Portuguese, Romansh, Spanish; Afrikaans, Dutch, English, German; Bulgarian, Czech, Polish, Russian, Slovak, Ukrainian; Greek; Hindi; Arabic, Hebrew; Turkish; Estonian, Finnish, Hungarian; Japanese; Chinese, Burmese; Sepedi and Basque) using a componential approach. Project brings together researchers from different countries and disciplines who have a major interest in language and emotion. GRID project was supported by the Swiss National Center of Competence in Research on Affective Sciences (SCAS), University of Geneva (Switzerland) and University of Ghent (Belgium). Here and further on the description of the project was borrowed from the participants' guidelines and from the collective monograph, which reflects results of GRID project (Components of emotional meaning. A sourcebook, 2013).

In the study native speakers judged the meaning of emotion terms in their languages, evaluating them on dimensions reflecting different components of emotional experience (Fontaine, Scherer, et al. 2007). The GRID consortium was coordinated by Klaus R. Scherer (Switzerland), Johnny R. J. Fontaine (Belgium) and Phoebe C. Ellsworth (USA).

3.1 Data mining

Before we present results of the experimental research we want to describe stages of GRID project, which we will name further on as GRID. First of all, 24 emotion terms (such as sadness, shame, guilt, compassion, love, contentment, happiness, pride, etc.), as well as the tasks to fulfill which were originally in English, were translated by the coordinators into their native languages, which we have already mentioned.

Participants of the project were asked to respond to a web questionnaire hosted on the SCAS website. In the web-based instrument each participant had to evaluate 4 out of 24 emotion words on a profile of 144 componential emotion features. The process of answering lasted from 40 minutes to about an hour. Each language had several data-gathering members (38 people) who followed the instructions provided by the senior coordinators.

The minimum necessary number of people under test in each language was 120. From the data reflected in the book based on the project results (Components of emotional meaning. A sourcebook, 2013) we see that the number of project participants varies from language to language. The largest number of people who have completed all the 17 categories of the questionnaire is 247 (Chinese, China, Beijing); large number – 220 (Spanish, Peru, Lima), 211 (Chinese, Taiwan, Chia-Yi). The smallest number of participants – 66 – was in Burmese (Burma, Myanmar) and in Hebrew – 81 – (Israel, Haifa).

We have 135 Slovak participants in the project and 125 Czech ones. Though there was no age limit, the average age of Slovak and Czech students is respectively 22.47 and 19.94. All the questions were grouped into several categories: categ. 1 evaluation (which included such items as features describing the person's evaluation or appraisal of the event – 31 items); categ. 2 bodily symptoms (features describing the bodily symptoms that tend to occur during the emotional state – 18); categ. 3 expression (features describing facial and vocal expressions and gestures, that accompany the emotion – 26); categ. 4 action tendencies (features describing tendencies to behave in certain ways that accompany the emotion – 40); categ. 5 subjective feeling (features describing the subjective experience that characterizes the emotion – 22); categ. 6 regulation (features describing ways in which the emotion can be regulated – 4); categ. 7 general (some general features of the emotion experienced – 3). These features are presented below in the tables, where they are abbreviated in such a way: categ2_i7 felt her or his heartbeat getting faster;
Most of the participants (with the exception of people from Tunisia (Arabic, Tunis) and Peru (Spanish, Lima) and partially Ukraine (Russian, Kiev) answered questions on-line; each participant was given four different emotion terms chosen at random by the computer. For Slovak students it was naturally to be involved into the project on-line; they were called by Vrabec "generation on-line" (2010: 82). The questionnaire was anonymous, but it was necessary to mention age, sex, education, country of residence and spoken languages. It was necessary to answer all the questions of the programme, otherwise the data were not accepted. Later on all the data obtained were thoroughly processed by the latest version of SPSS Statistics ver. 21. This gave us the opportunity to capture the most important dimensions measured by GRID with a limited number of well-differentiating and cross-cultural stable features.

4 Love and hatred as emotive terms

As we have already mentioned above, there are many classifications of emotions and feelings and approaches to their study. The question arises how to process the information about them, because ways of processing of the received data are considered to be a prominent aspect of psychological research. For many decades scientists offered varied methods of diagnostics of emotional states, verbal and nonverbal ways of feelings and emotions expression. Procedures which with each coil of progress in science become more and more complicated and accomplished result from the theoretical sources offered by scholars, as well as technical possibilities in a society on the given stage of progress.

The question is how after all the person expresses one's feelings and if there are differences in various cultures on adequate perception and interpretation of emotions. As Russell claims (1991), people belonging to different cultures, are capable to perceive and estimate correctly expressions of a human face, to define on it such emotional states, as pleasure, anger, grief, fear, disgust, and surprise. On the other side there are culture specific differences in expressing human emotions and feelings.

The analysis of studies performed by psychologists and linguists, gives us an opportunity to assume, that there are universal and specific ways of emotions and feelings expression. We may speak about linguistic and extralinguistic ways (Панасенко, 2009). GRID questionnaire mainly includes extralinguistic ways, such as gesticulation, facial expression, bodily movements and some others. Linguistic ways of emotions manifestation are presented by intonational ones (categ3"Expression – features describing facial and vocal expressions and gestures that accompany the emotion: spoke louder/ softer/ faster/ slower, had a trembling/ assertive voice, changed the melody of his/her speech, etc.).

Speaking about love and hatred as basic human feelings, we would like to state, that they have been investigated either by linguists or psychologists (Ильин, 2001; Fredrickson, 2001; Norman, 2005; Panasenko, 2012; Panasenko et al., 2012; Степанов, 1997; Tissari, 2003; Воркачев, 1995), but the studies were conducted mainly on a very small number of languages. We would like to mention the Edinburgh Associative Thesaurus (EAT), which is a set of word association norms showing the counts of word association as collected from subjects. According to it, love stimulated the following associations. Number of different answers is 49. Total count of all answers is 97. Here is the beginning of the list:

- HATE 32 0.33
- SEX 9 0.09
- GIRL 5 0.05
- LIFE 3 0.03
- MARRIAGE 3 0.03
- WAR 2 0.02
- AFFECTION 1 0.01

(Edinburgh Associative Thesaurus).

The list of associations shows, that top one in the list is hatred. It is a very interesting research based on English. GRID is based on a large number of languages. Its results allow us to see different ways of emotions manifestation in different cultures. Below we present results of comparative analysis of emotional markers of LOVE in Slovak and Czech.

4.1 Emotional markers of LOVE (Slovak data)

17 Slovak participants referred to these emotion terms which were described by 144 variables affording nine-point response scale for evaluation of each variable. Descriptive analysis of mean values of all variables showed, that Slo-
Vaks consider the terms "love, attachment" to be perceived by members of their culture mainly through positive characteristics, like something nice and pleasant (see table 1).

**Table 1. List of top ten characteristics which were stated by Slovak participants as extremely common for love markers**

Some characteristic of love markers were stated more common than the others (see table 2) (after Panasenko, Démuthová et al., 2012: 262).

**Table 2. Example of the first two the most common features in each category of love markers in Slovak sample**

People under test were of different sex. Though the number of males and females was not equal, it is possible to find out how love is being described and evaluated by men and women. Table 3 presents very interesting results of gender aspect of love evaluation and display (after Panasenko, Démuthová et al., 2012: 264).

**Table 3. List of characteristics that differ in Slovak sample according to gender with respect to love markers**

Contrary to common stereotypes, men scored significantly higher in data items connected with life change – they stated that love means that they are more ready to break contact with others (categ4_i27), to withdraw from people or things (categ3_i12), to adjust to the consequences (categ1_i25), etc. than women are. Notwithstanding gender differences in love evaluation, it is very interesting to state 7 common features which were in Slovak sample perceived identically by males and females. Love is for both genders something important in life what they head for (categ1_i10 and categ1_i11) and what they expect to get by God (or other supernatural power) (categ1_i15). They also have coincidence with some bodily symptoms (categ2_i10 – felt her or his breathing slowing down, categ3_i22 – changed the melody of her or his speech, categ3_i24 – spoke faster) (after Panasenko, Démuthová et al., 2012: 265).

**4.2 Emotional markers of HATRED (Slovak data)**

21 Slovak participants referred to this emotion term which was described by 144 variables affording nine-point response scale for evaluation of each variable. Description of the tables can be the same as in love markers (see tables 1 and 2).
Table 4. List of top ten characteristics which were stated by Slovak participants as extremely common for hatred markers

| category       | number of feature | description                                                                 | mean  | significance |
|----------------|-------------------|-----------------------------------------------------------------------------|-------|--------------|
| categ4_i37     |                   | wanted to destroy whatever was close                                        | 7.86  |              |
| categ3_i12     |                   | moved against people or things                                               | 7.33  |              |
| categ2_i2      |                   | felt weak limbs                                                              | 7.29  |              |
| categ2_i9      |                   | felt his/her muscles tensing (whole body)                                   | 7.24  |              |
| categ3_i15     |                   | spoke louder                                                                 | 7.19  |              |
| categ4_i3      |                   | felt the urge to stop what he/she was doing                                 | 7.19  |              |
| categ3_i22     |                   | changed the melody of his/her speech                                        | 7.14  |              |
| categ4_i26     |                   | wanted to do damage, hit, or say something that hurts                         | 7.10  |              |

Table 5. Example of the first two the most common features in each category of hatred markers in Slovak sample

Table 6 presents very interesting results of gender aspect of hatred evaluation and display.

number of category | description | mean male | mean female | sig. |
|-------------------|-------------|-----------|-------------|------|
| categ1_i6         | that was in itself pleasant for the person (independently of its possible consequences) | 6.00 | 2.94 | 0.011 |
| categ1_i7         | that was in itself pleasant for somebody else (independently of its possible consequences) | 6.00 | 2.75 | 0.008 |
| categ1_i22        | that was caused by chance                                                                | 6.00 | 3.50 | 0.004 |
| categ1_i15        | that was caused by a supernatural power (e.g., God, ancestors, ghosts)                   | 6.00 | 4.44 | 0.040 |
| categ1_i27        | that violated laws or socially accepted norms                                           | 4.80 | 5.56 | 0.015 |

Table 6. List of characteristics that differ in Slovak sample according to gender with respect to hatred markers

SPSS allows us to present obtained information in a different way. Figure 1 shows the answer distribution of the first category from Table 6. In the left column there are women’s answers and in the right column those of men. We can see that the markers for hatred in male and female understanding are extremely different: men want to tackle the situation, whereas women are sure that men’s behaviour violates laws or socially accepted norms.

4.3 Emotional markers of LOVE (Czech data)

17 Czech participants referred to these emotion terms which were described by 144 variables affording nine-point response scale for evaluation of each variable.

number of category | description | mean |
|-------------------|-------------|------|
| categ7_i5         | in what extent is it socially accepted to experience this emotional state in your society | 8.12 |
| categ2_i7         | felt his/her heartbeat getting faster                                               | 8.06 |
| categ4_i35        | wanted to be tender, sweet, and kind                                               | 7.94 |
| categ4_i39        | wanted to sing and dance                                                             | 7.82 |
| categ5_i3         | felt good                                                                               | 7.65 |
| categ4_i2         | wanted the ongoing situation to last or be repeated                                 | 7.59 |
| categ3_i11        | smiled                                                                                 | 7.53 |
| categ3_i22        | changed the melody of his/her speech                                               | 7.47 |
| categ4_i33        | wanted to take care of another person or cause                                       | 7.47 |
| categ5_i9         | felt energetic                                                                        | 7.41 |

Table 7. List of top ten characteristics which were stated by Czech participants as extremely common for love markers
In Czech sample only two characteristics (state accepted in the society and felt her or his heartbeat getting faster) scored in extreme values (mean 8,12 and 8,06); all others were perceived with central occurrence. Czechs evaluate features stated in GRID questionnaire less extremely which means they expect wide range of experiences when it comes to love. List of characteristics that were stated as the most common for "love" in Czech cultural group shows mainly positive features. They are connected with positive emotional feelings and caring tendencies (wanted to comply to someone else's wishes, wanted to take care of another person, wanted to be tender, sweet, and kind), and, what is more important, such a kind of the emotional behaviour is socially accepted in Czech society (after Panasenko, Démuthová et al., 2012: 266).

Table 9 presents interesting results of gender aspect of love evaluation and display (after Panasenko, Démuthová et al., 2012: 269).

| number of category | description | male | female | sig. |
|--------------------|-------------|------|--------|------|
| categ1_15          | that was inconsistent with the expectations of the person | 7,58 | 4,25   | 0,027|

Table 10. List of top ten characteristics which were stated by Czech participants as extremely common for hatred markers

| category          | number of feature | description                                                                 | mean | variance | sig. |
|-------------------|-------------------|-----------------------------------------------------------------------------|------|----------|------|
| categ1_129        | that was in itself pleasant for the person (independently of its possible consequences) | 4,80 | 8,08    | 0,037 |
| categ1_118        | of which the consequences were likely to be positive, desirable for the person him/herself | 5,00 | 8,00    | 0,048 |
| categ1_119        | of which the consequences were likely to be positive, desirable for somebody else | 5,00 | 7,67    | 0,048 |
| categ1_120        | of which the consequences were likely to be negative, undesirable for the person him/herelf | 6,20 | 2,17    | 0,014 |
| categ1_129        | where the person was treated unjustly (and felt offended) | 4,80 | 2,08    | 0,019 |
| categ3_112        | withdraw from people or things | 3,80 | 2,33    | 0,048 |
| categ4_17         | wanted to be in control of the situation | 6,20 | 3,50    | 0,037 |
| categ4_48         | wanted to take initiative him/herself | 6,80 | 4,33    | 0,037 |

Table 8. Example of the first two the most common features in each category of love markers in Czech sample

Table 10. List of top ten characteristics which were stated by Czech participants as extremely common for hatred markers

| category          | number of feature | description                                                                 | mean | variance | sig. |
|-------------------|-------------------|-----------------------------------------------------------------------------|------|----------|------|
| categ1_129        | that was in itself pleasant for the person (independently of its possible consequences) | 4,80 | 8,08 | 0,037 |
| categ1_118        | of which the consequences were likely to be positive, desirable for the person him/herself | 5,00 | 8,00 | 0,048 |
| categ1_119        | of which the consequences were likely to be positive, desirable for somebody else | 5,00 | 7,67 | 0,048 |
| categ1_120        | of which the consequences were likely to be negative, undesirable for the person him/herelf | 6,20 | 2,17 | 0,014 |
| categ1_129        | where the person was treated unjustly (and felt offended) | 4,80 | 2,08 | 0,019 |
| categ3_112        | withdraw from people or things | 3,80 | 2,33 | 0,048 |
| categ4_17         | wanted to be in control of the situation | 6,20 | 3,50 | 0,037 |
| categ4_48         | wanted to take initiative him/herself | 6,80 | 4,33 | 0,037 |

4.4 Emotional markers of HATRED (Czech data)

24 Czech participants referred to these emotion terms which were described by 144 variables affording nine-point response scale for evaluation of each variable (see Tables 1 and 2).
5 Discussion and conclusion

After the identification typical features of love and hatred in Slovak and Czech sample, we tried to identify the differences between these two nations. As we see from table 13 Czech and Slovak sample in love markers mainly coincide and are connected with emotional state (categ5.1 – was in an intense emotional state and categ5.2 – experienced the emotional state for a long time) and features regarding the bodily symptoms that tend to occur during the ensuing emotional state (categ2.16 – blushed). As it comes from the table, to love means for Czechs and Slovaks to be in an intense emotional state. Czech and Slovaks also think that love is connected with experiencing the emotional state for a long time.

### Table 11. Example of the first two most common features in each category of hatred markers in Czech sample

Table 12 presents interesting results of gender aspect of hatred display. According to the data, the way of displaying hatred for men is the intention to do damage, hit, or say something that hurts; whereas in female answers we find the variety of choice: to frown, to want to break contact with others and to do damage, hit, or say something that hurts (the last one coincides with men’s opinion).

### Table 12. List of characteristics that differ in Czech sample according to gender with respect to hatred markers

| number of category | description | mean Slovak | mean Czech | sig. |
|--------------------|-------------|-------------|-----------|------|
| categ5.18          | felt bad    | 5.06        | 2.07      | 0.055|
| categ5.17          | frowned    | 5.71        | 4.13      | 0.047|
| categ5.16          | wanted to be tender, sweet, and kind | 4.06 | 1.80 | 0.037 |

Table 13. List of characteristics that differ in Czech and Slovak sample of love markers

Table 14 shows that hatred display by Slovaks and Czechs is different.
Table 14. List of characteristics that differ in Czech and Slovak sample of hatred markers

For Slovaks hatred is associated with category 3 (expressions), which also includes movements and category 2 (bodily symptoms – felt weak limbs; felt his/her muscles tensing (whole body)). Czechs connect it with category 3 (expressions) – categ3_i5" – features describing facial and vocal expressions and gestures that accompany the emotion (frowning) and category 5 – subjective feeling (felt submissive, felt bad).

Figure 2 shows the answer distribution of the category 2_i2 from table 14, which has high scores in Slovak data. In the left column there are answers from Czech data and in the right column there are answers from Slovak data. We can see the differences between Slovak and Czech answers (for hatred).

Figure 2. Answer distribution for category 2_i2" (felt weak limbs)

We have made only the first steps in the direction of emotion study in a very limited way: two emotion terms (love and hatred), two West Slavic languages, but results obtained from GRID give us opportunity to describe cross-cultural similarities and differences of the emotion terms. Experimental data show that these are two different cultures and the ways of understanding, evaluation, perceiving love, relation to a partner are different. Thanks to SPSS-based approach we can specify extralinguistic means of emotions and feeling manifestation, which are important in cross-cultural research. In general, we can compare answers of people according to their gender, age and country – characteristics which were perceived identically and in a different way; we can find top ten characteristics which were stated by Slovak and Czech participants as extremely common (ranks from 8 to 9); we can specify features of significant correlation with one of seven categories and features it includes. In particular, in Slovak GRID data we see that mainly emotional state prevails (wanted to be tender, sweet, and kind; was in an intense emotional state; experienced the emotional state for a long time felt good; felt energetic) as well as bodily symptoms and movements (felt her or his heartbeat getting faster; felt warm (whole body); wanted to sing and dance). From Czech GRID data we may speak about such prevailing features as facial expressions and gestures (smile), vocal expression (changes of speech melody), bodily symptoms and movements (felt her or his heartbeat getting faster; wanted to sing and dance).

As far as GRID database includes 23 languages with their regional varieties our next step will be a cross-cultural study of emotive terms in languages of different families and study of ways of expressing emotions and feelings with the help of language means, i.e., semantics, syntax and intonation.

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