

# ETHNIC ATTITUDES MEASUREMENT WITH UNCONSCIOUS EMOTIONAL PRIMING ON DIFFERENT SOA

*Irina Plotka<sup>a,b</sup>, Dmitry Igonin<sup>c</sup>, Nina Blumenau<sup>b</sup>, Marija Bambulaka<sup>a</sup>,  
Elena Ozola<sup>a</sup>, Laura Simane<sup>b</sup>*

<sup>a)</sup> Daugavpils University, Paradas 1, Daugavpils, LV-5400, Latvia, e-mail: [irinaplotka@inbox.lv](mailto:irinaplotka@inbox.lv), [marija@keb.lv](mailto:marija@keb.lv)

<sup>b)</sup> Baltic Psychology and Management University College, Lomonosova 4, Riga, LV-1003, Latvia, e-mail: [nina.blum@gmail.com](mailto:nina.blum@gmail.com); [ozolaelena@inbox.lv](mailto:ozolaelena@inbox.lv); [laura.simane@hotmail.co.uk](mailto:laura.simane@hotmail.co.uk)

<sup>c)</sup> SIA "Latenta" Riga, Latvia, e-mail: [latent@balticom.lv](mailto:latent@balticom.lv)

## ABSTRACT

The research aim was to study ethnic attitudes using unconscious emotional priming measurement in the context of identification of cognitive processes on the different SOA; the research of the correspondence of the ethnic attitudes measurement results, received by explicit methods and priming measure. Participants: 312 (77 from Estonia, 235 – from Latvia), median – 23 years old. Implicit method: The procedure of unconscious emotional priming; Prime - Stimuli: "Russian", "Estonian", „Latvian", "French", "Chair". Target - Stimuli: Words from the Scale of Emotional Response by Schlosberg and set of letters (non-words). Randomly presented intervals SOA: 51, 85, 119, 204, 238, 510, 850, 1003 (msec.). Experimental design: 4x4x9x4. Explicit methods: The Scales of Ethnic Identity by Soldatova. Either manifested ethnic attitudes or overlapping with explicit measurements, results significantly depend on SOA. The evidences of cyclic dominance of activatory and inhibitory influences on response latencies on the stage of automatic response were received.

*Key words:* implicit method, explicit method, unconscious emotional priming, ethnic attitudes.

## INTRODUCTION

Implicit measurements measure automatic (unconscious) evaluative reactions which come to mind spontaneously, upon the mere presentation of the attitude object. (Fazio, Sanbonmatsu, Powell & Kardes, 1986, Houwer, 2006). They are indirect, i.e. the respondent doesn't know what is being studied.

Attitude refers to people's evaluation of a wide variety objects, issues, and people, including - the self. Both explicit and implicit methods of attitudes are commonly used (Petty & Brinol, 2010, p. 335). Explicit measures are those that directly ask people to report what their evaluations are, such as "Is Diet Coak good or bad?" In a recent review Petty, Fazio, and Brinol articulated three different meanings that have been applied to defining implicit attitude measures: indirect, automatic and unconscious. In the first meaning, implicit measures are indirect- they do not ask the individual to report his attitude like a direct measure does (Petty, Wheeler & Tormala, 2003). In the second meaning, implicit measures are said to tap into an automatic evaluative reaction, one that comes to mind spontaneously on the mere presentation of the attitude object,

rather than a more deliberative assessment that comes to mind on some reflection (Fazio, Jackson, Dunton & Williams, 1995). In the third meaning, implicit measures are said to tap into an attitude of which the person is unaware; an unconscious evaluations rather than a conscious ones (Kihlstrom, 2004). Attitude could be characterized as positive or negative evaluative reaction towards somebody or something, which is expressed as an opinion, a feeling or an intended behaviour. Implicit measures imply an effective assessment of attitudes, which are free of intended distortions or strategic manipulations (i.e. social desirability). Implicit measures are those tools, which could tap into automatic (unconscious) reaction, evoked by attitudes and divide them in to more deliberative reactions.

Authors held four stages of experimental studies at the period from year 2006 till present. The general aim of the study was the assessment of automatic (unconscious) ethnic attitudes. Implicit research method was the procedure of unconscious emotional priming. The procedure of unconscious emotional priming –is an experimental procedure, where the target stimulus is preceded on subliminal level by the exposition of preparing stimulus emotionally connected with it and distinguished by the subsequent perception mask (Fig.1). Apparatus: IBM-compatible PC, custom-made software for Microsoft Windows XP.

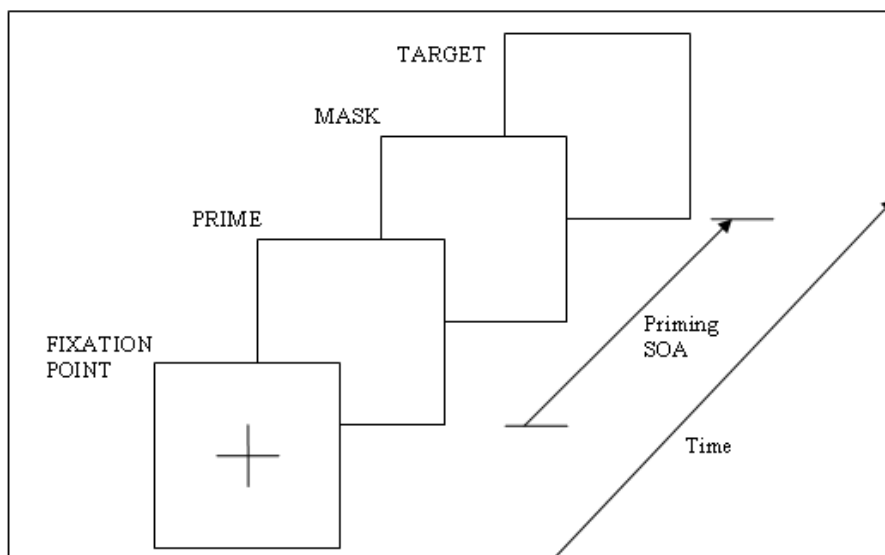


Fig.1. Sequence of displays

The tasks of lexical classification, including positively and negatively accented words, or target stimuli, were given to the participants. Before each stage of the task the prime – unseen word, name of the ethnic group – was shown to a participant for a short period. It was suggested that the participant has the formed implicit attitude towards the offered ethnic group. This attitude was unknown for the researcher. The aim of the researcher was to measure that attitude. The Stimulus Onset Asynchrony (SOA) is the time period between the first stimulus (prime) is exposed, and the second stimulus (target) is presented. The reaction time (RT) of the participant was fixed. Emotional valences of target stimuli and attitudes, positive or negative, could coincide or not coincide. With the help of the RT measurement it was valuated the rate of an implicit link of the defined notion with positive or negative attitudes: participant's position to the

correspondent ethnic group: “to oneself” – towards one’s own ethnic group, “to the neighbour” - towards the neighbour ethnic group, “to the other” - towards the alien ethnic group.

Hypothesis: Positive and negative attitudes manifest themselves in different reaction times for presented descriptive attributes of the ethnic groups. A fast reaction to a positive stimulus reveals a hidden positive attitude. A fast reaction to a negative stimulus reveals a hidden negative attitude (Table 1). The hypothesis is based on the assumption suggested by Fazio that in case of positive attitudes to an object, the object’s exposure accelerates further cognitive processing of positive stimulus (adjectives) (Fazio et al., 1986).

Table 1

**Hypothetic conformity of the reaction time (RT) at positive or negative stimuli and the presumed attitude to the ethnic group**

	RTs: Rapid	RTs: Slow
Positive stimulus	Positive attitude	Negative attitude
Negative stimulus	Negative attitude	Positive attitude

For the exposure of implicit attitudes the method of RT shifts was created (Plotka, Igonin & Blumenau, 2009, 2010a). Reaction time’s shift  $R$  was defined as the difference between RT to a positive stimulus  $T^+$  and RT to a negative stimulus  $T^-$ :  $R = T^+ - T^-$ .

The rule for finding the valence of attitude follows Table 1 and the definition of the shift Table 2: negative reaction time’s shifts correspond to positive attitudes, positive shifts correspond to negative attitudes.

In the first studies (Plotka et al., 2009, 2010a) they used two types of normalization of the reaction time, individual for each participant. Later it was shown that the discrepancy between the results obtained by the normalization and without it, is insignificant (Plotka et al., 2009). Therefore, further it has become possible to abandon the normalization and to define valence of attitudes according to absolute reaction time’s shifts.

The first three series of experiments and their results are presented in detail in the materials of scientific conferences and in scientific journals (Plotka et al., 2009, 2010a, Plotka, Igonin Blumenau, Bambulaka & Ozola, 2010b). The main disadvantage of the first series of experiments was the complexity of the classification of nouns and adjectives proposed to participants. The main disadvantage of the second series of experiments was the insufficiency of emotional expression of target stimuli ("bad", "good"). The main drawback of the first and second series of experiments was insufficient number of SOA intervals for a complete analyze.

Table 2

**Conformity of the reaction time’s shift and the presumed attitude to the ethnic group**

	Reaction time’s shifts $T^+ - T^-$		
	Positive	Null	Negative
Hypothetical attitude to ethnic group	“Negative”	“Neutral”	“Positive”

## **Research aim:**

The research aim was to measure ethnic attitudes using the unconscious emotional priming measurement in the context of identification of cognitive processes on the different SOA; the research of the correspondence of the ethnic attitudes measurement results, received by explicit methods and priming measure.

## **METHOD**

Experiments of 2009-2010.

### **Participants**

312 participants. Ethnic groups: „Russians from Latvia” – 161, „Latvians” – 74, „Russians from Estonia” – 41, „Estonians” – 36. Median age – 23 years old.

Ethnic groups “Russians” - participants who refer themselves to Russian culture bearers. “Latvians” - to Latvian culture bearers. “Estonians” - to Estonians culture bearers.

### **Methods:**

*Implicit method* – the procedure of unconsciousness emotional priming; *explicit method*: Scales of Ethnic Identity (Soldatova, 1998, 189-193).

### **Procedure:**

*Prime-stimuli*: “Russian”, “Latvian” or “Estonian”, “French”, “Chair”.

*Target-stimuli*: Words from the Scale of Emotional Responding by Schlosberg: “love, joy, happiness, good”; “rage, disgust, contempt, evil”; “collar, cup, sofa, grass” and set of letters (non-words): “nevg, ravtoienescht, byovyul, vatra”.

Prime – 10 ms; cube-shaped mask (masking time is included into SOA), randomly presented intervals of SOA’s: 51, 85, 119, 204, 170, 204, 238, 510, 850, 1003 ms; Target – 816 ms; Fixation point – 1000 ms.

Abstract from the instruction to the participant: „Push “Y” key as soon as possible if the word appears, and “N” key if the letters set (non-word) appears”.

## **RESULTS**

### **I. The study of the reaction time**

Using ANOVA the study of influence of the following factors on the RT was carried out: «Group» (2 levels: «RU», «LV» in Latvia or «RU», «EST» in Estonia); «Prime» (4 levels: Russian - «R», Latvian - «L» (or Estonian – «E»), French - «F», Chair - «C»); «SOA» (9 levels), «Target» (2 levels: «+», «-»). In the sample from Latvia by means of ANOVA statistical significant influences of the factors «Group» ( $F=54.77$ ;  $p=0.000\leq 0.001$ ), «SOA» ( $F=15.05$ ;  $p=0.000\leq 0.001$ ) and «Target» ( $F=348.91$ ;  $p=0.000\leq 0.001$ ) on the reaction time were revealed (Fig.2-4). In the sample from Estonia by means of ANOVA statistical significant influences of the factors ( $F=140.19$ ;  $p=0.000\leq 0.001$ ) and «Target» ( $F=37.51$ ;  $p=0.000\leq 0.001$ ) «Group» on the reaction time were revealed (Fig.2-3).

### **II. The study of the reaction time’s shifts**

Therefore, it is possible to reveal the supposed attitude to the appropriate ethnic group using the study of the shifts – differences – between the reaction time on the positive or negative stimuli (Table 2). Introduction of the shifts also gives an opportunity to purge the data from

variability of the response time scores which are determined by predicting activity of the participant during the experimental task.

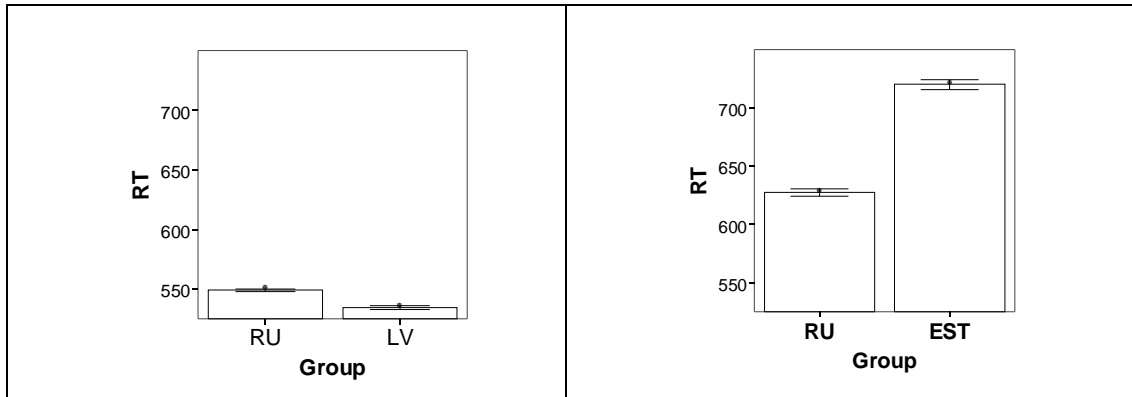


Fig.2. Means of RT (ms). Error bar show Mean +/- 1.0 SE. Influence of the factor „GROUP”.

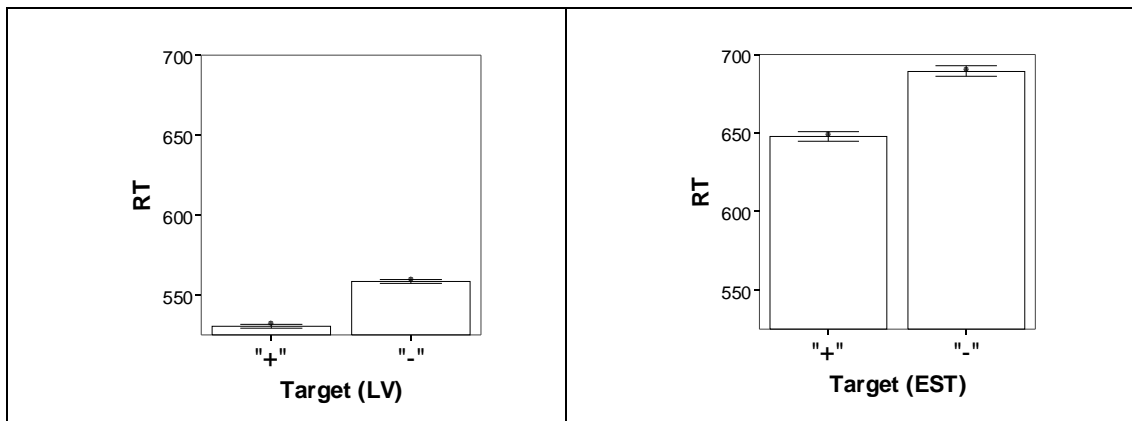


Fig. 3. Means of RT (ms). Error bar show Mean +/- 1.0 SE. The influence of the factor „Target”.

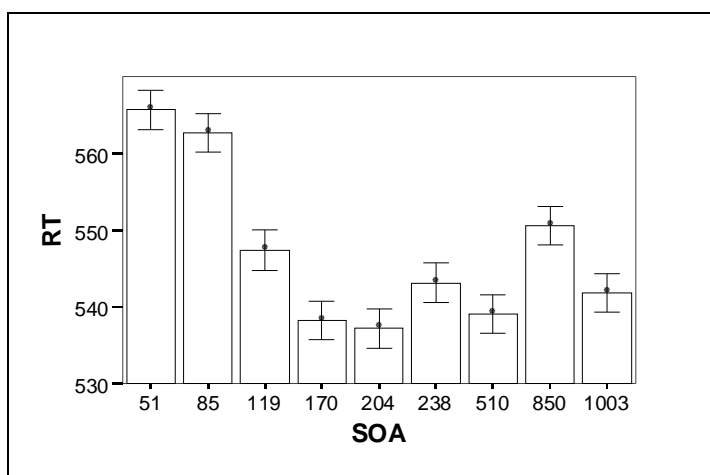


Fig.4. Means of RT (ms). The influence of the factor „SOA”.

By means of ANOVA the study of the influence of the following factors on the reaction time shifts was conducted: «Group» (2 levels: «RU», «LV» or «RU», «EST»); «Prime» (4 levels: Russian - «R», Latvian - «L», (or Estonian - «E») French - «F», Chair - «C»); «SOA» (9 levels). Statistical significant influences on the RT's shifts are not found. Therefore, it is possible to introduce general criteria for the valence determination of attitudes in all observations, i.e. the first and the third quartiles ( $Q_1$  and  $Q_3$ ) of reaction time's shift variable. According to Table 2, shifts exceeded third quartile conform to negative attitudes, shifts less than the first quartile conform to positive attitudes.

### **III. The definition of the attitude to the ethnic group based on the shifts**

To define the attitude towards the ethnic group the shift variable was divided according to the quartiles for all measurements on the high, medium and low indices: if the shift is lower or equal to  $Q_1$ , the attitude is positive. If the shift exceeds or is equal to  $Q_3$ , the attitude is negative. If the shift is between  $Q_1$  and  $Q_3$ , the attitude is neutral.

### **IV. The study of ethnic attitudes, based on priming**

The distribution of the latencies responses based on SOAs depending on ethnic group and prime stimulus are shown on the Fig.5-6. Statistically significant SOA's cases are underlined. The frequency analysis for the attitudes, based on the shifts, by means of Pearson Chi-Square and angular transformation of Fisher was conducting. For each SOA the percentages of the participants with positive and negative attitudes were compared.

### **V. The study of conformity of unconscious priming measure and explicit technique by Soldatova**

The technique by Soldatova "The ethnic identity" (Soldatova, 1998, pp. 189-193) contains six scales.

*The scale "Positive ethnic identity (norm)" (PEI)*

1. "Norm (positive ethnic identity) – is a combination of positive attitude towards the own ethnicity and positive attitude towards alien ethnicities. In the multiethnic society the positive ethnic identity is a kind of norm and is the nature of overwhelming majority. It establishes the optimal balance of tolerance to own and alien ethnic groups, that allows considering it, on the one hand, as a condition of independence and stable existence of the ethnic group, on the other hand, as a condition of peaceful intercultural co-operation in a multiethnic world".

*The scales of hypo identity*

2. Ethnic nihilism – is one of the hypo identity forms, which means the breaking off the own ethnic group and search for the stable social-psychological niches, based on non-ethical criterion.

3. Ethnic indifference – is the washing out of ethnic identity, expressed in the vagueness of ethnic belonging, irrelevance of ethnicity.

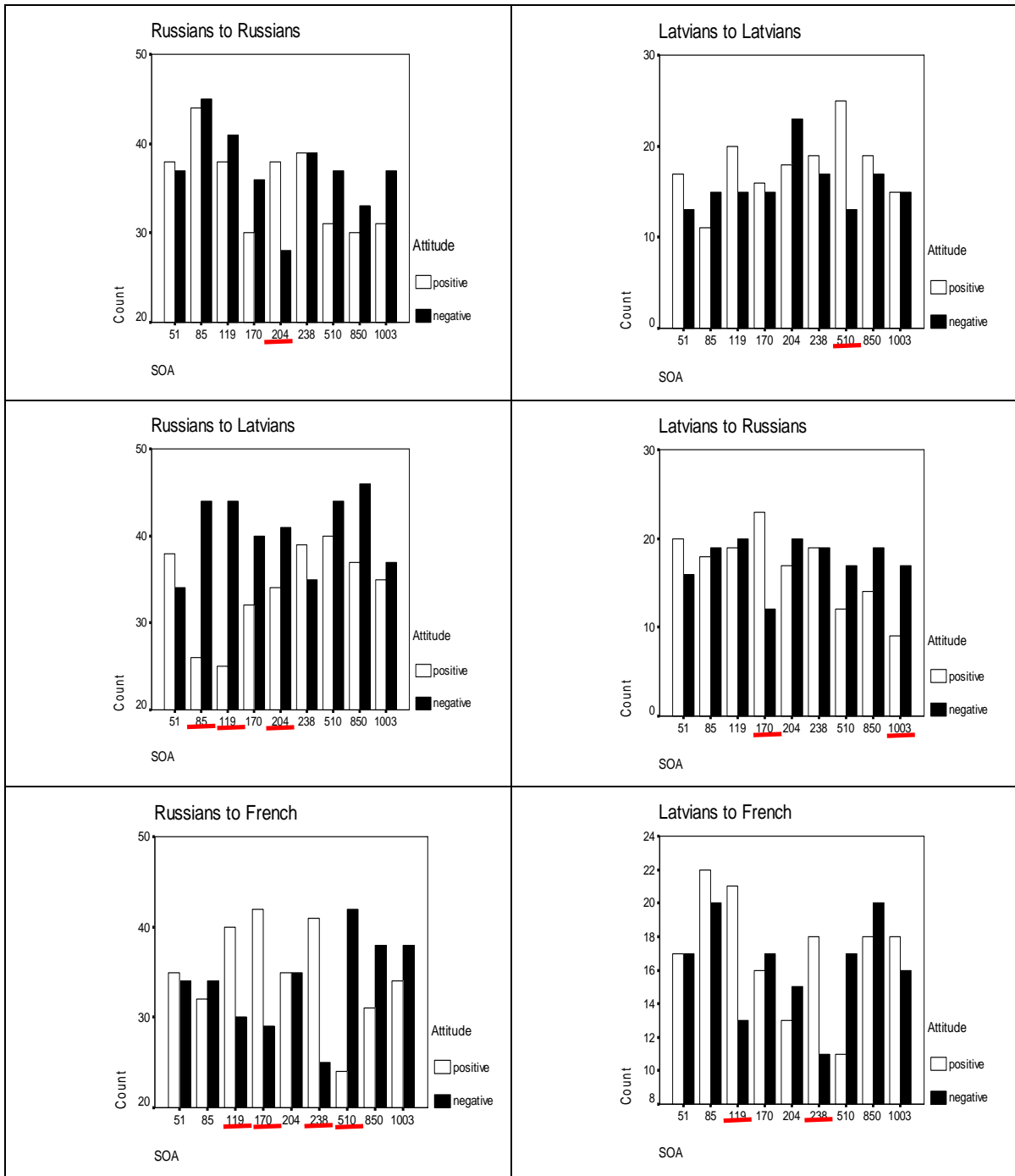


Fig.5. Distribution of the latencies responses based on SOAs depending on ethnic group and prime stimulus. The Sample from Latvia.

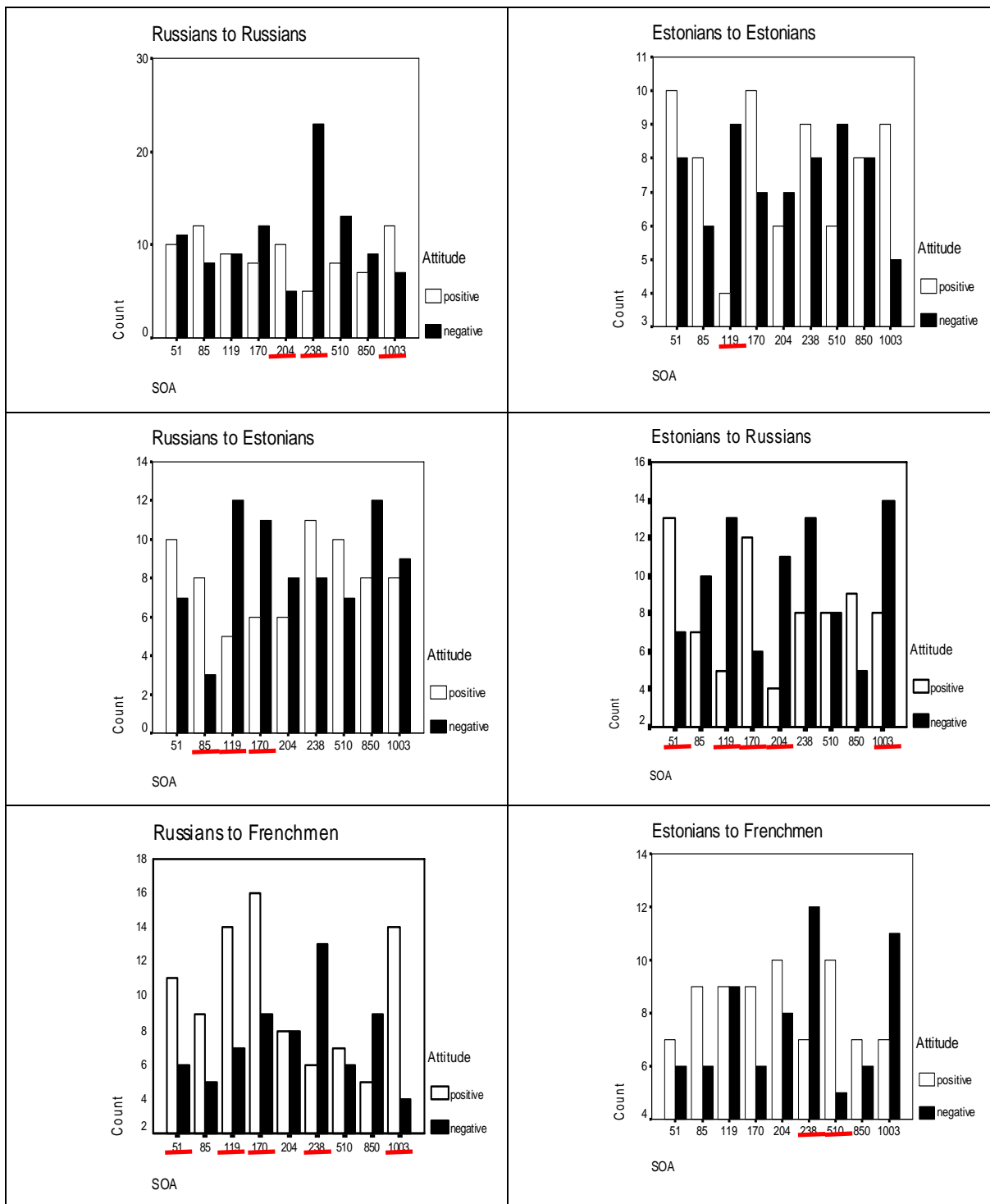


Fig.6. Distribution of the latencies responses based on SOAs depending on ethnic group and prime stimulus. The sample from Estonia.

### *Scales of hyper identity*

4. Ethnic egoism – this type of identity can express itself in the harmless way on the verbal level as a result of perception through the prism of the construct “my ethnicity”, but also can imply, for instance, tension and irritation in the communication with the representatives of the other ethnic groups or admission to the own ethnicity; the right to solve the problems at “somebody else’s” expense.

5. Ethnic isolationism – is a conviction in the superiority of the own ethnicity, admission of the necessity of “cleansing” of national culture, negative attitude towards inter-ethnic marriages, xenophobia.

6. Ethnic fanaticism – is a readiness to make any actions in the name of ethnic interests, understood one way or the other, up to ethnic “purge”, refusal to other ethnicity the right of use resources and social privileges, admission of the priority of rights based on ethnicity under the human’s rights, justification of any sacrifices in the struggle for wellbeing of own ethnicity.

Table 4

The conformity of attitudes and scales of ethnic identity

	Attitude	PEI	Hypo identity	Hyper identity
“To oneself”, “To neighbour”	Positive	High		
	Neutral	Medium		
	Negative	Low		
“To oneself”	Negative or Neutral		High	
“To neighbour”	Negative			High

The results of comparisons are reflected on the Fig. 7-9.

It was found that the coincidence of the results, revealed by explicit and implicit measurements also depends on SOA. The detailed analysis of this question occurs from the framework of the present paper and demands further investigation and detailed attention.

## **CONCLUSIONS AND DISCUSSION**

1. The RT of Estonian participants is the widest. The RT of Latvian participants is the shortest (Fig.2). It is associated with the factor of participants’ native language. While the value of absolute differences of the means of RTs between groups of participants with linguistically closer languages (Latvian, Baltic language group and Russian, East Slavic language group) is significantly less than between groups of participants – holders of linguistically distant languages – Russian and Estonian (Finno-Ugric language family). Earlier it was shown that the speed of implementation of the task of lexical decision also depends on the used language, and for Finnish it was the lowest comparing to Dutch (German group), and especially comparing to Hebrew (Semitic group) Finno-Ugric languages (Finnish, Estonian) unlike Indo-European ones (Dutch, Russian, Latvian) are richer morphologically. It is possible, the difference in morphological difficulty of languages and ways of representation of lexical units are the reasons of observed differences in reaction time, as in the task of lexical decision, as in the procedure of unconscious emotional priming used in the experiment. In both cases, the implementation of experimental task

supposes the lexical access, i.e. associated with the use of identical cognitive mechanisms and systems.

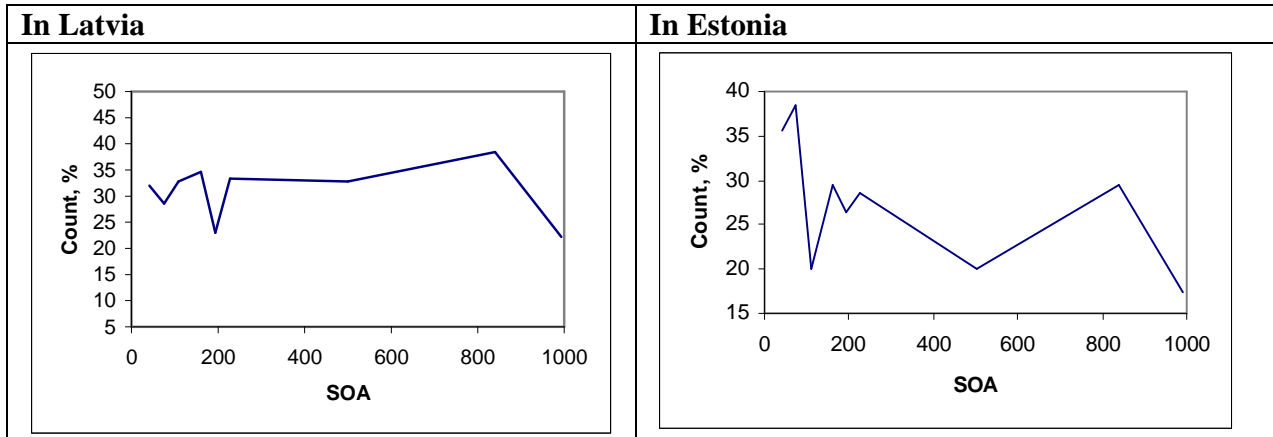


Fig.7. Hypo identity – Negative attitudes. The attitude “To neighbour”. The score rate of coincidences for the different SOAs.

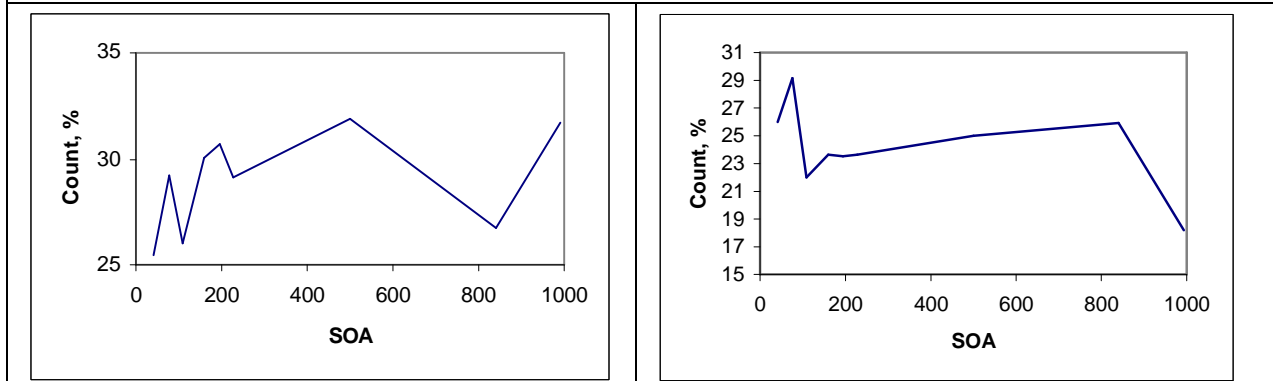


Fig.8. Hypo identity – Negative and neutral attitudes. The attitude “To oneself”. The score rate of coincidences for the different SOAs.

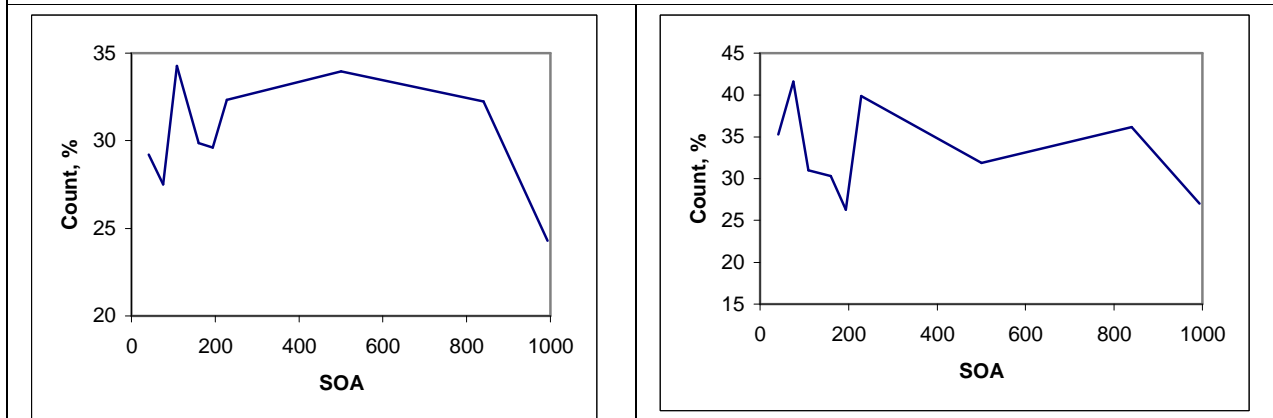


Fig.9. Positive ethnic identity – congruent attitudes. The attitude “To oneself” and “To neighbour”. The score rate of coincidences for the different SOAs.

2. The RT for positive target stimuli is less than for negative target stimuli (Fig.3). This result was observed at all the previous measurements as well. This fact resembles the effects observed during some types of explicit tests based on semantic information. For example, verification of parity of numbers is faster in the case of presentation of even numbers, rather than odd numbers (see *odd effect* (Bock & Warren, 1985); verification of the fact, whether the presented noun denotes animate or inanimate object is faster if the noun denotes animate object (Hines, 1990). The findings show that such effects are observed also in the task of unconscious emotional priming, when presented target verbal stimuli are affectively ambivalent and primed with affectively connected other verbal stimuli previously presented on subliminal level. This phenomenon must be considered in the studies with the use of the above procedure and is worth of a special research.

3. The results, obtained in the experiment pointed out on ambiguous attitudes according to different SOAs. These results induced us to address to the problem of the influence of episodic memory and semantic memory the expressed attitudes towards the ethnic groups. Any attitude (or attitude's components) can be presented as by information encoded in SM, as by information encoded in EM. In the EM the information about the concrete cases, taken place in a certain place and time is encoded. Traces of EM and SM differ by their qualities; in the EM the traces disappear faster, but have stronger effect. It can lead to the fact that generalized attitude towards an object, which is represented as an attitude in SM, can be changed under the influences of specific episodic traces. These influences can have inhibitory or activating influence depending on the level of accomplishment and coincidence of emotional valence of attitudes' representation in SM and EM. The pattern of these influences and an interaction of information from different parts of memory, relevant to the attitude, should define the effects of responses latency at different SOAs.

While measuring attitude implicitly, it is possible to register the waves of semantic and episodic influences on the responses latency depending on the SOA interval. Episodic influences, which have taken place recently, first of all should affect the short SOAs, because the power of appropriate traces is the strongest. The influence of remote episodes can be less expressed, yielding to the influences of the semantic representations of attitudes. That is why, the identification of the semantic representations of the attitudes is the most possible at the long SOAs. Attitude is a dynamic object. It has an ability to change, depending on whether it is confirmed or denied by "fresh" episodes.

The ambiguity of the attitude on the different intervals of SOA based on the criterion of shifts could be connected with the problem of ethnic attitude representation, and differences in the level of attitude formation. At the same time the access of activation, spreading from prime-stimulus to the different components of the attitude can occur at different speed. Besides, an attitude can contain semantic (steady, stable, long existing) components, which are associated with deliberate "attitude" to the attitude object, and more labile episodic components potentially opposite by affective valence to the semantic component of the attitude. The access to the episodic component identifies the ambiguity of implicit measurement of attitude by the criterion of the shifts. The development and support of these provisions in the framework of modern concepts of attitude representation is a challenge for future research.

Implicit measurement of attitudes could be employed in the practice of establishing procedures of behaviour correction in cases of clinical forms of racial and ethnic intolerance, psychological intervention with other target groups. Also it can be used in the selection of staff,

whose activities are connected with the necessity of working with different ethnic groups and representatives of ethnic minorities.

The data received in the process of the research give the opportunity to speculate about the nature of implicit attitudes and their relations with explicit attitudes. The conducted researches are one of the stages of solving the problems of the use of implicit attitudes for studying various social constructs. It is planned to continue the work in this direction for deeper understanding of implicit constructs functioning mechanism. The studied implicit methods of research can be used for information collection by science research and political structures with the purpose of analysis, forecasting and management of ethnic processes, learning and education, at international cross-cultural programs and for the assistance in self-awareness and self-appraisal. The results can be used in the education process by lecturers of higher schools specialized in the area of politics, social psychology, including ethno-psychology, mass-media, etc. The research will give the opportunity to wider the range of the searches for the ways of minimization the negative manifestations influencing formation of attitudes of the conscious tolerance.

## REFERENCES

- Bock, J. K., & Warren, R. K. (1985). Conceptual accessibility and syntactic structure in sentence formulation. *Cognition*, 21, 47-67.
- De Hower, J., 2006, What are implicit measures and why are we using them? In R.W. Wiers & A.W. Stacy (Eds.), *The handbook of implicit cognition and addiction* (pp. 11-28). Thousand Oaks, CA: Sage Publishers.
- Fazio, R. H., Jackson, J. R., Dunton, B.C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology*, 69, 1013-1027.
- Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R., 1986, On the automatic activation of attitudes. *Journal of Personality and Social Psychology*, 50, 229-238.
- Hines, T. (1990). An odd effect: Lengthened reaction times for judgements about odd digits. *Memory and Cognition*, 18, 40-46.
- Kihlstrom, J. F. (2004). Implicit methods in social psychology. In C. Sansone, C.C. Morf, & A.T. Panter (Eds.), *The Sage handbook of methods in social psychology* (pp. 195-212). Thousand Oaks, CA: Sage.
- Moscoso del Prado Martín F., Bertram R., Häikiö T., Schreuder R., & Baayen R.H. (2004) Morphological family size in a morphologically rich language: the case of Finnish compared with Dutch and Hebrew. *Journal of Experimental Psychology: Memory, Learning and Cognition*, 30, 6, 1271-1278.
- Petty, R. E., & Brinol, P. (2010). Attitude structure and change. Implications for implicit measures. In B. Gawronski & B.Keith Payne (Eds.), *Handbook of implicit social cognition* (pp. 335-352). The Guilford Press: NY, London.
- Petty, R. E., Wheeler S. C., & Tormala, Z. L. (2003). Persuasion and attitude change. In T. Millon & M. J. Lerner (Eds.), *Handbook of psychology: Volume 5. Personality and Social Psychology* (pp.353-382). Hoboken, NJ: Wiley.
- Plotka, I., Igonin D., Blumenau N. (2009), The research of ethnical attitudes by means of procedures unconscious emotional priming and self-reporting methods. *Economika ir*

vadyba:aktualijos ir perspektyvos. 2(15), 218-226. Siauliu Universitetas, Socialiniu Mokslu Fakultatas.

<http://journals.indexcopernicus.com/karta.php?action=masterlist&id=2656>

[http://www.su.lt/bylos/mokslo\\_leidiniai/ekonomika/09\\_02\\_15/plotka.pdf](http://www.su.lt/bylos/mokslo_leidiniai/ekonomika/09_02_15/plotka.pdf)

Plotka, I., Igonin D., Blumenau N. (2010a). Unconscious emotional priming and self-reported ethnical attitudes: the aspect of correspondence of measurements. In *Identifying the personality of a soldier in the science of psychology – a step forward the future. Scientific articles of the 45-th International Applied Military Psychology symposium. Latvia, Riga, June 1-4, 2009* (pp. 45-55). Daugavpils: Daugavpils University Academic Press „Saule”.

Plotka, I., Igonin D., Blumenau, N., Bambulaka, M., & Ozola, E. (2010b). Modern technologies in a social and psychological research: implicit methods of studying the ethnic attitudes. *Professional Studies: Theory and Practice*, 6 (pp. 166-174). ISSN 1822-3648. (In Russian)

Soldatova, G. U. (1998). *Psychology of interethnic tension*. Moscow: Smisl. (In Russian)