

INVESTIGATING IMPLICIT ATTITUDES TOWARD HISTORICAL MEMORIES



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ABSTRACT

The implicit, emotional characteristics of the memory representations in relation with national cultural/historical persons were investigated in a laboratory experiments. 86 Hungarian and 84 Hungarian diaspora students participated in the study and a version of Implicit Association Test (IAT) combined with a semantic-differential method was administered. In the experiment a target classification task (Hungarian vs. Foreign) was required to perform in parallel with different attribute classification tasks. The target categories were either given names or historical names and the attribute categories corresponded to the dimensions of semantic-differential scale were good-bad and strong-weak and active-passive (separated block wise). The category-response mapping between the target classification and the attribute classification task changed within the experiments and could be either compatible or incompatible. As a most important result, a robust IAT effect was found for historical/cultural names in the evaluation (good-bad) dimension evidenced by high IAT scores i.e. by the performance differences between compatible and incompatible mapping conditions. The results indicate a strong positive implicit attitude toward the Hungarian historical/cultural memories. Furthermore the overlap in the pattern of results between the two groups of participants may characterize the effectiveness of national emotions in forming of attitudes independent from the current cultural/historical context.

Keywords: cultural-historical memories, collective identity, national identity, implicit attitude, IAT.

INTRODUCTION

It has a long lasting history in the psychology to consider the overt behaviour at least partly as a manifestation of unconscious factors that are out or beyond of conscious control and self-observation (e.g. introspection). The issue of 'hidden' determinant of behaviour had been emerged in different fields of psychology in the variety of conceptual distinctions like consciousness-unconsciousness, attentive-automatic processes, explicit-implicit memory and so on. The dilemma of the explicit and implicit attitudes in social psychology settled in the focus of the present study can be seen as a version of this issue. The distinction between explicit and implicit attitudes suggests, at first sight, a surprising claim, that an evaluative opinion and feeling, i.e. an overt personal and subjective position that we could have on something could not be shown necessarily in our behaviour in a direct way. This claim seems to be more astonishing if we accept that the effects of the attitudes including presumably attitudes toward the objects of our personal environment and they effect on behaviour could be beyond of conscious, voluntary control. In the present study we investigated the dynamics of implicit attitudes toward the cultural/historical memories that are supposed to form an inevitable part of the cultural identity among group of subjects who are involved to a different extent in the life of the cultural/historical communities of Hungarian nations.

EXPLICIT ATTITUDE, IMPLICIT ATTITUDE

The term explicit attitude refers to person's evaluative opinion and views toward concepts, objects or people. The person is aware of the explicit attitude and feeling and is able to report and control it consciously. The acquisition of explicit attitudes through explicit learning process makes it possible, if it is needed, for the person or even for others to re-form and re-structure the attitudes. The so called fast learning system (Sloman, 1996) is supposed to contribute predominantly to this learning process which use verbal-symbolic representations and abstract logical rules but it can be subjected to the higher order/level organisation processes (see Rydell and McConnell, 2006). Nevertheless the attitudes can be manifested indirectly, automatically, i.e. through implicit way, circumventing the conscious, overt attention. In the background of the process of implicit attitudes the slow learning system is supposed to take an active part. The development of the implicit attitudes can explained by referring to automatic processes during which the object of attitudes can be associated with particular/contextual information without contribution of any kind of higher level processes. The implicit learning evolves slowly and it organized by associative argumentation corresponding the classical law of association, i.e. similarity and proximity. The slow learning system can be characterized as a spontaneous, unconscious learning process through non-verbal and usually subliminal stimulation. The implicit attitudes influence primarily the spontaneous behaviour that is dominated overwhelmingly by automatic processes.

The explicit-implicit dichotomy of the attitudes, although it seems to be obvious, it is rather problematic for researchers (see Nosek, 2007). Considering the radical methodological

differences (see below) it seems to be acceptable the notion that the concepts refer to distinct, separated constructs. This view holds implicitly that implicit methodologies cannot be considered as a way of measuring attitudes at all. Another possibility is that the two constructs are overlapping to some extent and the implicit and explicit measurement techniques estimate the same thing. The third theoretical position holds that both implicit and explicit measures refer to the very same thing, consequently all kind of divergence in the observations can be ascribed to effects of factors extraneous to and indifferent for the attitudes. In line with this possibility beyond a convergence in the explicit and implicit evaluation of attitudes usually found in attitude studies the variability of the correlation depending on the research topics at hand can be interpreted as an effect of contributing factors like intra- and interpersonal variables or contextual variables.

The explicit-implicit terminology is used to denote the (conscious or unconscious) mental representations stored in memory as well as the (direct or indirect) measurement methods for assessing different types of cognition (Nosek, 2007). For assessing explicit cognition and attitude traditionally a variety of direct methods can be applied requiring that subjects think consciously and deliberately of an object and express their opinion toward the given object a self-assessing way by using a semantic-difference scale (Osgood, 1957) or kinds of Likert-scales (Likert, 1932). The assessment of implicit cognition is rather problematic due to its inherent nature that can be characterized as being unconscious, lesser controllable, and manifesting with high efficiency even without deliberate intention or the involvement of awareness. In other words, an explicit way of attitude measure is lesser effective for assessing inexplicable factors or for ones that are hardly to be explained.

Instead of explicit techniques indirect procedures can be suggested for assessing the physiological correlatives or consequences (e.g. skin conduction, brain activity during imagine observation, eye movements) of the implicit cognitions (see Cunningham, Zelazo, 2007). However, the approach of measuring implicit cognitions based on some well-defined psychophysiological correlation has a strong assumption regarding the assessment of implicit attitude at the behavioural level. The implicit attitude test (IAT Greenwald et al. 1998) which is based on the subtle analyses of response latencies proved to be the most effective way of assessing the implicit attitudes at the behavioural level.

THE IMPLICIT ASSOCIATION TEST (IAT)

The basic question in the background of assessment of the implicit attitudes concerns to the possibility of finding/figuring out a behavioural situation in which an effect of the automatic, uncontrollable implicit cognitions/attitude or at least an aspect of performance can be estimated. Assuming that a measurable aspect of a reaction to an object (e.g. a decision in a classification task) can be influenced by an unconscious, evaluative opinion, the differences in the behaviour (e.g. reaction time, RT) toward attitude objects evaluated a priori positively or negatively can be considered as an index of the positive or negative implicit attitudes. Reversely, if a behavioural situation offers a “surface” for estimating the implicit effects, then

this situation may be used for measuring of the implicit attitudes toward different attitude objects. Such an effect can be demonstrated in the priming experiments. It has been shown (Fazio et al., 1986) that mere subliminal presentation of a positively evaluated concept is beneficial for the positive category in the subsequent positive vs. negative classification task. In other words, a positively primed attitude affects a measurable aspect of behaviour without any conscious mediation. The Implicit Attitude Test (IAT) (Greenwald et al, 1998) as a basic methodology of implicit attitude measurement is based on a similar principle.

The IAT is a standardized form of the attitude measurement that requires a computer and a quiet experimental/laboratory circumstances. The procedure has been developed by Greenwald and his colleagues more than a decade ago has become by now a prevailing method for measuring the implicit cognition. It is designed to measure the differences in response latencies based on the relative strength of the automatic associative relations. The participants carry out a computerized classification task in which stimuli (words or pictures) needs to be classified into categories as fast and accurately as possible by pressing the corresponding response buttons. The target categories (e.g. weapon vs. flower) refer to attitude object (names of flowers and weapons) and the attribute categories corresponding to the extremes of evaluative dimensions (good vs. bad) refer to various adjectives (pleasant, rude etc.). In one critical condition (combined block) the two classification tasks needs to be performed alternately so that a pair of target and attribute categories correspond to the same manual response (e.g. left hand: weapon or bad and right hand: flower or good). In another critical condition (reversed combined block) the response mappings among the tasks change; the target category-response associations become reversed (e.g. left hand: flower and right hand: weapon) and the attribute category-response association remain the same (e.g. left hand: bad and right hand: good). The means of response latencies measured in the combined and reversed blocks is usually find to show a characteristic difference; in one mapping condition the RT is slower than in another mapping condition. For estimating the strength and orientation of the implicit attitude, the so called IAT effect can be computed by the differences in RTs measured in the two combined blocks. By default, the shorter RT mean in one of the combined blocks as compared to that in another one indicate a preference for one of the target categories. Stronger or positive attitude can be assumed toward the category for which the category-response mapping was in accordance with the category-response mapping of the positive attribute category in a block where the RT was found to be shorter (compatible mapping condition). When the mapping among the attribute category-response and target category-response does not correspond to the underlying evaluative attitudes (incompatible condition) the RTs prolong. The effect can be interpreted as a kind facilitation effect due to the automatic association. The bias (implicit attitude) in favour of either of the target categories (e.g. positively evaluated flowers) facilitates the response to the corresponding/congruent attribute category (good) and vice versa.

In the last decade the IAT has been applied for a great variety of social psychological topics including explicit attitudes, prejudice, beliefs, stereotypes, impression formation, person and self perception and so on (see <https://implicit.harvard.edu/implicit>). Even beyond the pure scientific interest a considerable attention has been paid to the IAT methodology in various

filed of applied psychology (e.g. marketing). Nevertheless, the IAT has been a matter of empirical and methodological debate (see Lane et al 2007). For example, it has been querying whether the IAT methodology, as a measurement of the relative strength of associations and as a transparent assessing of the preferences is a valid measure of attitudes and implicit behavioural tendency and not that of cultural knowledge (construct validity problem). It is the IAT a more adequate method for predicting of future behaviour as compared to the explicit methods (predictive validity problem)? To what extent can the IAT measure the implicit tendency in accordance with other implicit measurement methods (convergent validity problem)? To what extent may depend the IAT effect on the social desirability or on other social/situational factors, and on some potential experimental contributing factors such as the labels and salience of categories, stimulus familiarity (internal validity problem)?

One possible source of the reliability and validity problems mentioned above may be the 'premature' scoring algorithm introduced originally by the authors of the IAT (see Greenwald et al, 2003). The most important feature of the "conventional" procedure was a robust data transformation including the transformation of error-trial latencies and log-transformation of the RTs. Recently (Greenwald et al, 2003), in consideration of the divergent empirical investigations a new, improved scoring algorithm has been introduced. Shortly summarizing, in the improved algorithm in addition to the data from the test blocks the data from combined practice blocks are also reckoned without any further transformation (i.e. log-transformation). Instead, the mean latencies averaged for practice blocks and test block separately are corrected with its associated pooled standard deviation (SD) values for each subjects. The *D* score calculated by the improved scoring method indicates a little or no effect (i.e. a balanced attitude) for values lesser than 0.2, a slight effect size (i.e. strength of the implicit attitude) for values up to 0.5, a moderate one for values up to 0.8 and a strong implicit effect for values above 0.8.

A further methodological problem emerges from the standard experimental design of the IAT procedure. The order of the combined and reversed combined blocks is counterbalanced among participants however, it is fixed within subject. As a result, the performance in the blocks in the later part of the experiment may reflect the effect of a kind of cognitive inertia from the previously adopted task setting. Specifically, performance impairment, i.e. prolonging the response latency may be evident in the block presented in later part of the experiment as a source of the switching requirement between two task settings (i.e. categorization rules). In other words the IAT effect can be interpreted as an interaction between the effects of the implicit attitudes and the load on the working memory/executive control system (see Mierke, Klauer, 2001). As a consequence the IAT effect may be overestimated when the incompatible block comes second and underestimated when compatible block comes second (Messner, Vosgerau, 2010). The general message emerging from the order effect problem is that the IAT may be a group-level measurement method of implicit attitudes, for evaluating the individual implicit preferences it can be used only after controlling the order effect.

MULTI-DIMENSIONAL IAT AND THE EXTENSION OF THE IMPLICIT ATTITUDE MEASUREMENT

Usually in the IAT studies not more than two target and two attribute categories are under investigation at the same time. Recently, a multidimensional version of the IAT procedure has also been introduced (md-IAT, multi-dimensional Implicit Association Test) (Gattol et al., 2010), which comprises two or more separated IAT measures, allowing a more detailed analyses of implicit attitudes toward multiple categories or complex mental representations. In the present study we followed a similar experimental/research logic and a version of the multidimensional IAT has been developed. In order to extend the measurement of the implicit attitudes beyond the well-investigated aspects of evaluative dimension the standard IAT method was combined with the semantic differential methodology. The aim of this extension was to gain a more informative picture of the emotional representations of the historical/cultural memories.

Osgood's semantic differential scale

The semantic differential is the most common way to examine explicit attitudes. It measures the emotional meaning of attitudes along more variables. One advantage of the semantic differential is that it helps to describe the attitudes towards words along three dimensions.

Osgood (1957) aimed to explore the semantic representation of words and developed a method to quantify the difference between the connotations of words. The semantic differential reveals the field of meaning of phrases or concepts by the means of bipolar adjectives. Bipolar adjectives represent the two extremes of a scale on which the subjects have to place the words using a Likert scale. This method provides information about the connotative meaning of the attitude object. The semantic differential scale measures the direction and intensity of the reactions. Osgood found using factor analysis that the associations for a word can be grouped into three factors, which are evaluation, potency, and activity explaining two-third of the variance of answers (Osgood et al., 1957 pp. 47-66). The reliability of these three factors was replicated and confirmed by many studies (Heise, 1970). Certain bipolar adjectives are proven to be suitable for describing a whole factor. These pairs of adjectives might be prototypical regarding the factor; e.g. good-bad for the evaluation, strong-weak for the potency and fast-slow for the activity factors respectively. Furthermore semantic differential is demonstrated to produce reliable and exact results even if only a few bipolar objectives are used during the examination, which represent the connotative meaning of the dimension concerned. Osgood has provided a universal method for studying a wide variety of attitudes.

PRESENT STUDY

The aim of this research can be considered to be rather multifaceted. In the first place we aimed to explore the emotional characteristics of the cultural-historical memories. For this purpose we did not focus on the historical knowledge gathered through formal education; instead we concentrated on the possible additional emotional connotation of the cultural-

historical memories which serve supposedly the basis of the personal and collective national identity. We investigated experimentally the implicit characteristics of the cultural/historical memories related with the Hungarian/national history that are supposed to be emotionally “well-saturated” as compared to that of the non-national (Foreign) i.e. supposedly neutral cultural/historical memories. In the second place we investigated the question as to whether the national characteristics/aspect of collective identity may be related specifically to historical memories or it may adopt a bare linguistic/cultural orientation. To approach these aims the implicit representations were investigated in relation with historical memories, and besides, with cultural/linguistic memories without any historical associations. In the third place the emotional/implicit aspect of the national/cultural identity were investigated in terms of the socio-cultural context. We were inquiring the extent to which the current socio-cultural setting provided for a person as a source of history may affect the implicit attitudes toward the historical memories of origins. To achieve this implicit attitude experiments were carried out among subjects who were living in Hungary and in Transylvania as members of the Hungarian diaspora. In the fourth place as a methodological novelty the IAT procedure was extended beyond the good vs. bad dimension toward remaining dimensions of the semantic-differential scale.

This research was conducted as a part of the National/Hungarian memory research project initiated in the recent years by University of Debrecen (see Münnich and Hunyady, 2010). It has an immanent relationship with the long lasting flow of research on the topics of national identity and national emotions (e.g. Csepeli without date; Hunyady, 2010). It is also related indirectly to the flow of narrative psychological approach of national emotions (e.g. Ferenczhalmy et al. 2011).

Participants

The most important factor during sampling was that the participants’ historical and cultural knowledge should be stable and widespread enough to quickly recognize a historical person’s name. Based on this we have chosen students attending the 11th grade in Debrecen, Hungary and in Székelyudvarhely, Transylvania. Eighty-six Hungarian and eighty-four Transylvanian students participated in the study; the distribution of genders was equal in the two groups. The study was approved by the school board and the participation was voluntary.

Methods

The measurements were administered to groups of 15 students during classes in the computer science classrooms and the procedure took approximately 35-40 minutes. The investigator was present during testing and at the beginning he gave information about the aims and purposes of the study.

The tests were administered on computers of same characteristics, which were an Intel Atom N270 processor with 1 GB memory and Windows XP Operating System. The PCs had Samsung SyncMaster 943SN monitors with the following display settings: 1360*768 resolution, 60 Hz refresh frequency. The distance between the participants and the monitors was approximately 50-70 cm. The experiments were constructed using Inquisit (2.0 version; Millisecond Software, 2004). Statistical analyses were conducted with Statistica (7.1 version; statSoft Inc., 2005).

Stimuli and tasks

Two decision making tasks were administered during testing with reaction time measuring according to the principles of IAT. In the case of the Adjective task the subjects had to indicate into which one of two attribute categories a certain adjective belongs by pressing a button. The attribute categories matched the dimensions of the semantic differential: evaluation – good vs. bad; potency – strong vs. weak; activity – active vs. passive. In the case of the Name task the participants also had to press a button to indicate to which target-category a name belonged. Names were common given names and names of historical persons, the two possible target-categories were ‘Hungarian’ vs. ‘Foreign’. The ‘E’ and the ‘I’ keys served as response buttons. The two tasks had separated training parts consisting of 20 trials for each task after which the trials were mixed, that is Adjective and Name trials appeared intermittently. The combined task consisted of 20 training trials and 40 test trials. This was followed by 20 training Name trials with exchanged response buttons. The last two blocks of the experiment (20 and 40 trials) included mixed task order, where the Adjective task had the original response button order and the Name task required inverted response key pressing.

During the whole experiment, that is for every participant the order of the target- and the attribute categories was fixed. In the Name task given names appeared first followed by whole historical names. During the adjective task the order of the attribute categories was the following: good-bad; weak-strong; active-passive. Based on the settings of the experiment it can be regarded as six separate IAT investigations, namely in the order of appearance: 1. Given name – Evaluation 2. Historical name – Evaluation 3. Given name – Potency 4. Historical name – Potency 5. Given name – Activity 6. Historical name – Potency. Seven blocks belonged to each IAT (*Table 1*).

Table 1. The structure of the experiment depicting the order and function of the blocks along the tasks belonging to them. The number of trials in each block is also indicated. The ‘Setting’ column represents the order of the blocks with compatible (C) and with incompatible (I) category-response arrangement. For half of the sample the order was reversed (Incompatible: 1-4; Compatible: 5-7). The last two columns show the order of the multidimensional IAT for given names and for historical names.

	Block	Task	Mapping		Given name	Historical name
1.	Training -20	Name	-	<i>Evaluation</i>	1.	2.
2.	Training – 20	Adjective	-			
3.	Training -20	Name and Adjective	C	<i>Potency</i>	3.	4.
4.	Test - 40	Name and Adjective	C			
5.	Training – 20	Name	-	<i>Activity</i>	5.	6.
6.	Training -20	Name and Adjective	I			
7.	Test - 40	Name and Adjective	I			

The placement of the target- and the attribute categories (right or left upper corner) hinted to the placement of the response key; e.g. left upper corner – Hungarian – left response button). According to our hypothesis Hungarian people have a positive attitude towards Hungarian history and culture. Based on the logic of IAT studies this means that the spatial overlap between the positive attributes and the Hungarian name categories can be regarded as a compatible relationship. Therefore a compatible situation is when the Hungarian target-category and the good/strong/active attribute categories are both on the same (left) side (of course the same principle applies to the relationship of foreign names and bad/weak/passive categories). Incompatible setting is when the foreign names and the good/strong/active attribute categories are on the same side (Figure 1). The order of the compatible and incompatible blocks was balanced among the participants, that is half of the subjects completed the blocks in a compatible-incompatible order and the other half of them in a reversed order.



Figure 1. Stimuli setting. The given names (left part of the figure), the historical names (right part of the figure) or the examples for the evaluation dimension randomly appear in the centre of the display. In the left and right upper corner the categories belonging to the Name and Adjective tasks were permanently visible during one block. The left picture shows an example for the compatible setting where the ‘Hungarian’ and the ‘good’ categories were assigned to the same response key as the ‘foreign’ and the ‘bad’ categories belonged to the same button. The right part depicts an example for an incompatible arrangement with reversed response button placement in the case of the Name task.

Stimuli were presented on the middle line of the display with Arial font type of 36 size. In the left and right upper corner of the monitor the attribute and aim categories were displayed with the same font type but of 28 size. For the better distinction of the tasks the attribute categories and adjectives were of green colour and the target categories, the given names and the historical names appeared in white. The stimuli were visible until the participant pressed the appropriate response key. Wrong responses were feed back by a red “X” appearing above the stimulus. Subjects had to correct their answers by pressing the appropriate button as quick as possible. The stimuli disappeared following the right response. After 400 ms a new stimulus was displayed. (In IAT experiments usually 200 ms response – stimulus interval is applied. We decided to use a wider time gap to make the task easier, lower the error ratio and the incapability effect.) The software displayed the adjectives and names in a random order with one limitation, namely a word could only be redisplayed when the pool was used up. In the combined task setting another limitation was added. Here the stimuli of the target category were always followed by items of the attribute category. This means that during a combined block the Name and the Adjective tasks alternated.

The list of the given names contained 21 common and frequently used Hungarian male given names and 21 foreign given names (Latin/German/English/American/Spanish/Italian/Russian). These names were assembled in a way so that they would be also known as given names of famous historical persons or artists, e.g. János – János Arany, Mátyás – Mátyás Hunyadi, Joseph – Joseph Haydn, George – George Washington. In this way the 21 given names formed a part of the 21 historical/cultural persons' names. The historical names were chosen according to the required level of knowledge in the 11th grade. The length of the names was approximately equal in order to avoid reaction time prolongation due to longer reading time. Three groups were formed from the 21 given names and the 21 historical names to prevent overlaps, e.g. names used in the given name – evaluation IAT were not included in the given name – potency task. No such limitations were applied for the adjectives. The adjectives belonged to dimensions of Osgood's semantic differential and were chosen from a widely known wordlist (Dúll and Varga, 1994). Eight adjective pairs were picked for each dimension, e.g. for the evaluation category: dangerous – safe, pleasant – unpleasant, useful – useless; for the activity category: calm – tense, fast – slow, boring – exciting; for the potency category: small – big, short – long, soft – solid. During the selection of adjective pairs we tried to find the most representative ones for the specific scale which are also easy to understand without any possible ambiguity.

At the beginning of the experiment the task was explained shortly. Every block began with a written instruction unambiguously demonstrating the following task and the list of adjectives with the adequate category pairs was also displayed. The instruction emphasized the importance of the quick and accurate responses. The experiment was divided into three main parts allowing the participants to take short breaks.

Results

All 170 subjects invited to participate in the study accomplished the tests, however the results indicated data exclusion in case of some participants. Instead of the usual selection criteria (90% response accuracy in average) we applied a more severe criterion system considering the length of the study and the supposedly different difficulty levels of the blocks. The data were omitted for those subjects who did not reach an accuracy level of 80% in at least two blocks from the total of 42 of the whole experiment. Due to the fact that in most of the blocks the achievement level was high for every person, this restriction had significance only for the 28 blocks in which the especially difficult active-passive and strong-weak attribute categorization task were used. A prominent fall-back in the achievement level may have been masked by the averaging procedure with the traditional selection criteria. As the latest scoring method of IAT effect does not take into consideration the accuracy of a given answer (see above), the achievements difference between the major blocks can cause a distortion of the averaged achievement indexes. The application of this selection criterion led to data omission from the whole data set in case of 28 participants and two experimental groups consisted of 68 and 75 people respectively were created for the Hungarian and the Hungarian diaspora subpopulation. The mean accuracy level in both groups was above 90%, considering in all six IATs including the compatibility and incompatibility blocks.

During the preparation of RT analyses no further data transformation were carried out. Mean RTs and standard deviations were computed for each combined (practice and test) blocks (block 3, 4 and 6, 7) of the six IAT experiments that were formed by pair-wise combination of the categories of attitude objects (given name, historical name) and attribute dimensions (good-bad; strong-weak; active-passive). Half of the combined blocks were compatible, the other half were incompatible. Means and SDs for compatible and incompatible blocks can be seen in Table 2, as a function of factors of attitude object and attribute dimensions separated for the two samples.

For the data of reaction time a $2 \times 3 \times 2 \times 2$ repeated-measure ANOVA was carried out with Object (given name vs. historical name), Dimension (value vs. power vs. activity) and Compatibility (compatible vs. incompatible) variables, as within factors and Country (from Hungary and of the Hungarian diaspora) factor as group factor.

Table 2. Based on the attitude object (given name, historical name) and the attribute dimensions (good-bad, strong-weak, active-passive) the established six IATs show the descriptive statistics of the measured (reaction time) and calculated (D values) data on the two samples (from Hungary and the Hungarian diaspora). N: number of subjects, M: mean, in brackets standard deviation (STD) value; C-index: compatible set up; I-index: incompatible set up.

Country	Attribute dimension	N	Given name				Historical name			
			Mc	Mi	D	Mc	Mi	D		
Hungarians from Hungary	good-bad	68	799 (159)	1041 (230)	0,67 (0,43)	889 (119)	1205 (171)	0,43 (0,34)		
	weak-strong		824 (175)	829 (179)	0,002 (0,47)	759 (169)	748 (153)	-0,04 (0,23)		
	active-passive		924 (183)	963 (188)	0,09 (0,31)	848 (176)	887 (194)	0,09 (0,31)		
Hungarian diaspora	good-bad	75	889 (188)	1205 (232)	0,73 (0,38)	809 (152)	956 (189)	0,46 (0,29)		
	weak-strong		896 (176)	953 (195)	0,17 (0,35)	837 (171)	868 (180)	0,03 (0,28)		
	active-passive		1017 (224)	1082 (214)	0,17 (0,289)	942 (200)	1018 (216)	0,16 (0,36)		

Figure 2 shows the means of RT measured in compatible and incompatible mapping conditions as a function of object categories (given names and historical names) separated for the two sub-samples when the adjective classification tasks accomplished in parallel with target classification tasks were different according to the three attribute dimensions. The main effect of Country indicated short RT means in the case of the Hungarian diaspora [$F(1, 141)=17,8$; $p<0,001$]. The main effect of the Object factor [$F(1, 141)=251$; $p<0,001$] was due to the faster RTs to historical names as compared to that of given names. The main effect

of Dimension factor reached significance [$F(2,282)=139$; $p<0,001$], which according to the results of contrast analyses was due to the fact that the speed of responding in categorization tasks was significantly slower when applying active-passive (activity) attribute dimension than in the case of good-bad dimension, whereas the best performance was along the strong-weak dimension [$t(140)$ values $> 6,4$; $p<0,001$]. The Dimension x Name interaction [$F(2,282)=29,6$; $p<0,001$] showed that the performance difference between the given name-historical name tasks was the highest besides the good-bad categorization [$t(140)$ values $> 5,8$; $p<0,001$], while it was besides the two other adjective classification tasks approximately similar ($t<0,04$). This effect was similar in both sub-samples, indicated by the non-significant three-way interaction of Country x Dimension x Name ($F=1,7$).

The significant main effect of Compatibility [$F(1, 141)=201$; $p<0,001$] was due to worse performance in case of incompatible arrangement. The significant two-way interactions of Compatibility factor indicated a strong compatibility effect in case of the Hungarian diaspora [$F(1, 141)=10,4$; $p<0,01$]; in case of a given name categorization [$F(1, 141)=38,5$; $p<0,001$], and when the secondary task required a good vs. bad categorization as compared when it did an active vs. passive [$t(140)=11,8$; $p<0,001$] or a strong vs. weak categorization [$t(140)=15,7$; $p<0,001$].

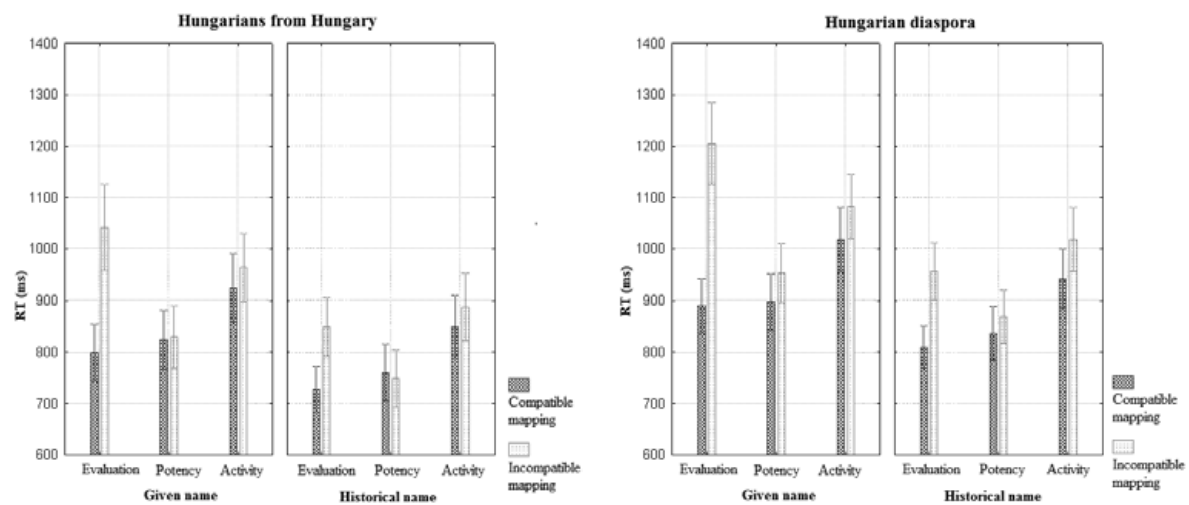


Figure 2. RTs (in milliseconds) and Standard error of the means in case of compatible and incompatible mappings among the Target and Attribute classification tasks separated for the Given Name and Historical name IATs as a function of the semantic dimensions (evaluation, potency, activity) applied in the attribute classification tasks on the samples of students from Hungary (upper part) and of the Hungarian diaspora (lower part). The difference of compatible and incompatible columns indicates the size of the IAT effect.

Defining and analyzing D scores

The quantitative evaluation of the implicit approach comes from the difference between reaction time data measured in various sorting blocks. The RT difference between the combined blocks with compatible and incompatible category-response mappings has been evidenced by the above mentioned analysis. However, the accurate estimation of the IAT

effect requires a definition of the so-called “D score” through the transformation of reaction time data. In the present study we followed the scoring procedure developed by Greenwald et al. (2003) as follows. Mean latency and standard deviations were computed for each combined block (including block 3, 4, 6 and 7) for each participant and for each IAT separately. The trials were deleted when RTs was found to be above the level of ‘mean + 2.5 STD threshold’. In the following steps two difference scores were calculated from the mean RT data, one for the practice blocks (block 6 minus 3) and one for test blocks (block 7 minus 4). The difference scores were divided by the pooled STD value (calculated for practice and for test blocks separately) and, at the end the two scores were averaged. This procedure was applied in every IAT. The D score calculated this way served the dependent variable for a 2 x 3 x 2 repeated measure ANOVA, where the Object (given name vs. historical name) and Dimension (evaluation vs. potency vs. activity) variables were present as within factors and Country (Hungarians and the Hungarian diaspora) as group factors.

Figure 3 shows the D scores for each individual participated in the study in a 3D scatterplot separated for the two IATs (given name and historical name) and for the two sub-samples. The edges of the cube corresponded to the three reference dimensions (Evaluation, Potency, and Activity) applied in the attribute classification tasks. The numbers at the endpoints of the three dimensions (i.e. values -2 and +2) express a maximum level of the emotional bias, accordingly the 0,0,0, co-ordinate values or the center of the “square” represents a total neutrality with regard to the target categories (Hungarian vs. Foreign). The figures illustrate properly that in both of given name and historical name IAT the D scores were quite similar for the individuals of the two sub-samples; the deviation is rather small, and the data characteristically show a shift towards the positive endpoint of the Value dimension. (As exceptions one can notice some data in the case of given name IAT for Hungarians from Hungary.)

A 2 x 2 x 3 repeated measure ANOVA for D values showed a significant Country effect [$F(1, 141)=5,9; p<0,05$] indicated by the higher D scores in the group of the Hungarian diaspora. Neither of the interactions of Country factor were significant (F values<0,95). The significant Object effect [$F(1, 141)=39; p<0,001$] showed that in the Given name IAT the D values were essentially higher, indicating substantially stronger positive bias toward the Hungarian category. The significant Dimension effect [$F(2, 282)=178; p<0,001$] showed a perceptible difference between the attribute categories. According to the results of contrast analysis the D scores were essentially higher in the Evaluation dimension [$t(140)$ values>14,5; $p<0,001$] than in the other two dimensions, and in the Activity dimension it was higher than in the Potency dimension [$t(140)$ values>3,04; $p<0,001$]. The contrast analysis showed that the significant Object x Dimension [$F(2, 282)=14,8; p<0,001$] interaction was due to the fact that in comparing the given names and historical names the difference in D score was substantially higher in the Evaluation dimension than in the Potency and Activity dimensions [$t(140)$ values>3,1; $p<0,001$], while in the Activity dimension it was basically zero. Because the Country x Object x Dimension triple interaction was not significant, it can be said that the positive D score differences between the Object categories in the Evaluation and the Potency dimensions, as well as the D score similarity in the Activity dimension was equally manifested in both sub-samples. All these statistically established connections are illustrated in figure 4.

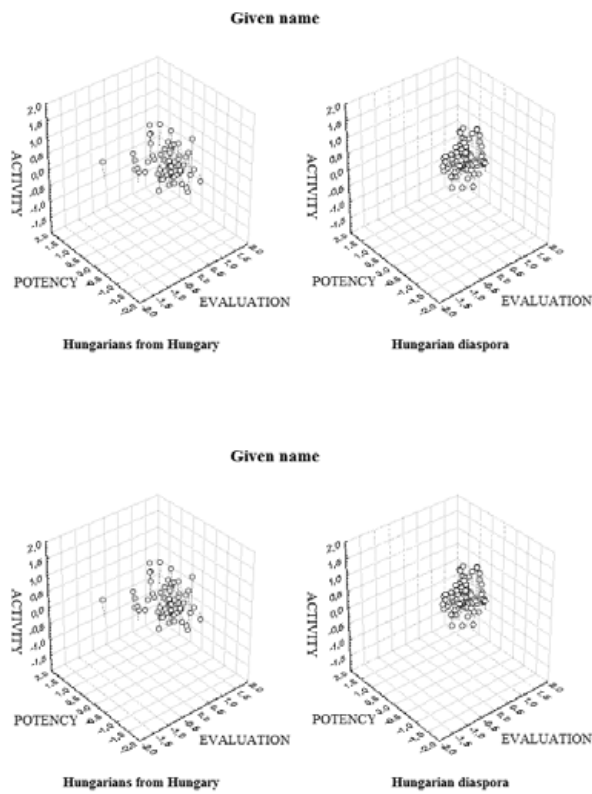


Figure 3. The plots of D scores for each subject in the three attribute dimensions (evaluation, potency, activity) in Given name (upper part) and Historical name (lower part) IATs on the samples of Hungarians and the Hungarian diaspora.

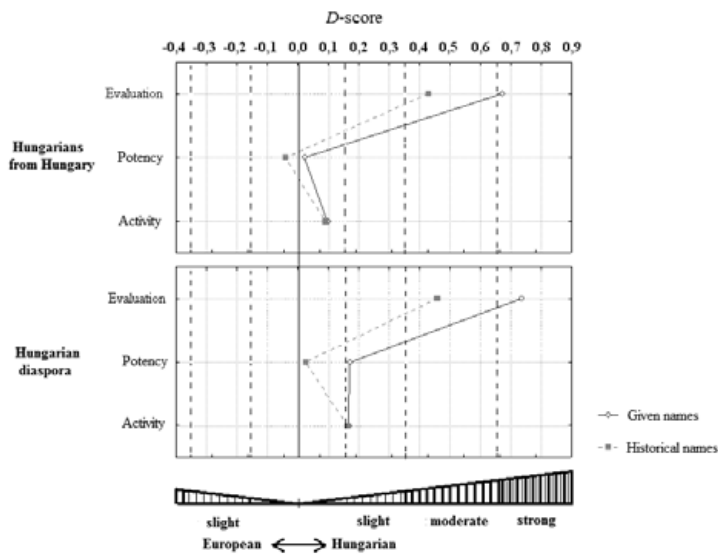


Figure 4. The size of the IAT effect characterized by D-scores in the sub-samples of Hungarian and the Hungarian diaspora in the Given Name and Historical name in IAT as a function of the semantic dimensions of the attribute categorization tasks (evaluation, potency, activity). The positive values represent a preference towards the Hungarian terms (given names and historical names).

In order to check the potential effect of cognitive/attention inertia (see above) we examined the D scores as a function of the ordering of the mapping conditions that was for the half of the participants compatible-incompatible but reversed for the other half. we applied A 2 x 3 x 2 x 2 repeated measure ANOVA was carried for the D scores with Object (given name vs. historical name) and Dimension (value vs. power vs. activity) as within-subject factors and Country (from Hungary and the Hungarian diaspora) and Order (CI vs. IC) as group factors. The significant Order x Dimension interaction [$F(2, 278)=5,18; p<0,01$] indicated that the IAT effect in good-bad and strong-weak dimensions was found to be weakening, but in active-passive dimension it seemed to be rather strengthening when the compatible mapping came second. It should be noted, however, that the main effect and any other interactions of the Order variable did not reach the level of significance, which implies that the IAT effect might have been altered to a very small extent depending on the order of the blocks.

DISCUSSION

At the starting point, as a heuristically acceptable thesis we assumed that memories of historical events mediated by formal and informal education may be not only the basis for cultural knowledge as part of the so called crystallized intelligence but it could have a fundamental importance for the self-esteem and self-perception within the frame of the personal and cultural/national identity. From this perspective it seems reasonable to assume that the organisation and characteristics of the mental representation related to emotionally well-saturated historical events could be different as compared to that of the emotionally in- or lesser significant historical events. Considering, that the cultural/national self-identity (e.g. I am Hungarian) develop in a series of fine distinctions through inter-personal and person-environment interactions we supposed that national/historical memories may have profound impact on the development of cultural identity when the self-relevant distinctions should highlight a sharp inter-personal contrast (e.g. I am Hungarian and not Romanian).

In the present study we investigated the mental representations of historical/cultural memories among groups of Hungarians living different cultural-historical circumstances by using a procedure that is supposed to be able to characterize quantitatively the implicit aspect of emotional relations. The experimental method we used combined a classical technic of explicit attitude measurement (semantic-differential scale) with a recently developed reaction-time based experimental method (IAT) dedicated specifically to measuring implicit attitudes (emotional bias). In this computerized task, the subjects were asked to categorize names as attitude objects in terms of its cultural orientation (Hungarian vs. non-Hungarian (Foreign)). The stimuli could have a historical relevance (historical names - emotional condition) or they could be given names without historical associations (neutral condition). In parallel with the name classification task the subject accomplished an attribute classification task, in which adjectives (attributes) must have been classified into categories that corresponded to either of semantic dimensions of semantic-differential scale (good vs. bad; active vs. passive; strong vs. weak).

In accordance with the standard interpretation of IAT effect a performance difference in RT was expected between target categorization performance in both type of stimuli (names) depending on the S-R mapping relations between the target categorization task and the attribute categorization task. In conditions in which the preferred target category corresponded to the positive poles of attribute dimensions (compatible condition) shorter mean response latency was expected as compared to that in conditions with different category-response arrangement (incompatible condition). A compatible-incompatible difference in favour of the Hungarian category was supposed to be the expression of an implicit emotional bias toward the Hungarian memories. A positive bias was expected to be manifested in each semantic dimensions (attribute categories). We supposed subjects for whom the Hungarian attribute is a matter of primary importance in terms of personal and collective identity will show a stronger emotional bias toward Hungarian categories. Furthermore the implicit tendency was expected to appear as stronger when the stimuli could have a priming effect on the associative network of the cultural-national concepts (historical names) as compared to that when they could not (given names).

The results of the analyses revealed some robust but slightly unexpected pattern of observations. The RT data and *D*-scores were found to show a strong and reliable difference between the compatible and incompatible conditions, owing to the higher RT means in the incompatible conditions. In other words the response latency prolonged significantly when category-response mappings between the attribute and the target categorization tasks were not in accordance. This pattern of result as a default IAT effect can be interpreted as an indication of the unbalanced implicit attitude toward the categories of attitude objects. This effect was evident toward both type of objects (historical names, given names), however it was found to be manifested to a different extent in name conditions due to the unexpected differences in the *D*-scores in favour of the given name without any historical associations. In other words, a strong implicit positive attitude has been manifested toward the Hungarian category independent from the type of the target objects, however surprisingly the robust positive bias was found to be stronger toward given names. (We expected a more effective emotional effect for historical names that should have been manifested in a robust IAT score difference between the target category conditions.) Although the effect for both types of target categories has had a positive orientation the unexpected difference necessitates a more detailed elaboration. An obvious interpretation would suggest that the historical memories, or at least the examples of the historical names we used mobilized the affective, emotional reactions to a lesser extent, or in a more strict sense, the historical memories could have less emotional relevance. However, our preferred interpretation tries to find a way to the very opponent direction. Considering that the IAT methodology assesses the implicit emotional attitudes by comparing the relative strength of the between-concept associations, a question could arise as to whether the bias toward an object A in contrast to an object B will have appeared to a similar extent when contrasting it to an object C. (For example, the preference of wine could be strong as compared with the preference of beer, however it could be more strong as compared with that of beverages.) Since in the present study both sets of the Hungarian and Foreign historical names comprise of names of well-known heroes and artist who or whose works a person could

have an enthusiastic feeling to, the examples of both category could have been evaluated positively. Accordingly the Hungarian vs. Foreign classification could have been affected to a less extent by the response mapping relation between categorization (target and attribute) tasks performed parallel. In other words the both mapping conditions could have been compatible or incompatible to the same extent. In consideration to this the positive bias toward the Hungarian historical category in the contrast of a positively evaluated alternative category should be interpreted as a reflection of a strong but slightly underestimated emotional relation. In short, the present experimental manipulation was able to detect the positive implicit attitude toward the Hungarian historical memories in a lesser effective way; consequently it may have underestimated the true magnitude of the emotional bias toward the historical memories. This explanation can easily be tested by using a modified set of stimuli.

Taking into account the dimensions of the emotional meaning we can get a more detailed picture of the implicit attitudes toward the object categories investigated. The IAT effect was more pronounced in the good vs. bad dimension, furthermore the difference in the IAT scores between the object categories (historical names and given names) proved to be the greatest in that dimensions but it was only small or practically vanished in the remaining dimensions. In line with the interpretation sketched above these observations may indicate a robust shift in the dimensional structure of the emotional meaning toward the evaluating dimension for both object categories. In other words, the implicit preference of the national/historical memories can be best characterized as a distance on the good-bad axis. The axes of active vs. passive and strong vs. weak turned out to be lesser informative in this respect. In pure methodological respect, the result may indicate that the attempt to estimate the implicit attitude resulted in easily interpretable pattern of data in the evaluation dimension, but it was lesser effective in the more abstract activity and potency dimensions of connotation.

The observed null effect in the latter dimensions might be due to the difficulty in translating the examples of the adjectives into one of the corresponding attribute categories. In addition to the delayed response latencies observed in the activity and potency IATs, this conclusion might also be indicated by the enhanced prone to errors in those conditions. As a generalized conclusion, it can be suggested the IAT as a method for estimating implicit emotional tendencies is probably a less powerful method when an active vs. passive or a strong vs. weak categorization is used as a secondary task. It should be mentioned, that this pattern of result may be in line with a pure technical, design-related interpretation. It is possible that the order of the IATs (evaluation, potency and activity dimensions used for the 1. 2. and 3. IAT respectively) that was fixed for all subjects might be the cause for the decreasing tendency in the IAT effect. Although the order effect should have had an additive relation with the implicit bias, the IAT effect might have been attenuated due to a kind of learning effect. A firm conclusion as to whether the worth of the methodological modification of the IAT procedure presented in this study might be given only after eliminating the possible effects of learning.

One of the spectacular outcomes of the present study concerns the nearly perfect overlap of the data pattern between the two subgroups of participants. Accordingly the implications of the observations detailed above may appear to hold true for the Hungarians on both side of the border; strong implicit bias toward the Hungarian/national memories evidenced especially

by given names but implicitly even by historical names, primarily in evaluation dimension. This result is slightly different as compared to the expected one; however it is far from being astonishing. The results imply that the national identity may involve evidently a strong emotional bias toward all of the components and elements of the national identity including the historical memories, even though the current social/political/cultural context can not necessarily be seen as supportive optimally as it is generally expected. However, such an overlap and similarity of data between different sub-populations of Hungarians is supposedly not a general phenomenon and it may be uneasy to reproduce when different measurement technics are used (explicit vs. implicit methods) or when sub-populations are under investigations determined by intersections of the variety of socio-cultural-economic factors. Further studies may reveal a numerous interesting facts in these respects.

REFERENCES

- ALLPORT, A., WYLIE, G. (2000): Task switching, stimulus-response bindings, and negative priming. In MONSEL, S., DRIVER, J. (eds.): *Attention and Performance XVIII: Control of cognitive processes*. Cambridge, MIT Press, 35–70.
- BRUNEL F.F., TIETJE B.C., GREENWALD A.G. (2004) Is the Implicit Association Test a valid and valuable measure of implicit consumer social cognition? *Journal of Consumer Psychology 14*: 385–404.
- CUNNINGHAM, W.A., ZELAZO, P.D. (2007) Attitudes and evaluations: a social cognitive neuroscience perspective. *Trends in Cognitive Sciences. 11*: 97–104.
- CSEPELI Gy. (évszám nélkül) *Nemzeti tudat és érzésvilág Magyarországon a 70-es években*. Múzsák Közművelődési Kiadó.
- DÚLL A, VARGA K, (1994) *Általános pszichológiai gyakorlatok II. Egyetemi jegyzet*, Tankönyvkiadó, Bp. 125–131.
- 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, Vol 50 (2)*, 229–238.
- FERENCZHALMY R., SZALAI K, LÁSZLÓ J. (2011) Az ágencia szerepe történelmi szövegekben a nemzeti identitás szempontjából. *Pszichológia, 31*. 35–46.
- GATTOL, V., SÄÄKSJÄRVI, M., CARBO, C-Ch. (2011) Extending the Implicit Association Test (IAT): Assessing consumer attitudes based on Multi-Dimensional Implicit Associations. *PLoS ONE. Vol. 6. 1. e15849*. 1–11.
- GREENWALD A.G., BANAJI M.R. (1995) Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review 102*: 4–27.
- GREENWALD A.G., MCGHEE D.E., SCHWARTZ J.L.K. (1998) Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology 74*: 1464–1480.
- GREENWALD A.G., NOSEK B.A., BANAJI M.R. (2003) Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology 85*: 197–216.

- HEISE, D.R. (1970): The Semantic Differential and Attitude Research. In: *Attitude Measurement*. (eds.) Gene F. Summers. Chicago: Rand McNally, pp. 235–253.
- HUNYADY Gy. (2010) Történelem, nemzeti nézőpont, pszichológia: Egy tucat tézis a kutatás háttéréről. In: Münnich Á., Hunyady Gy. (eds.) *A nemzeti emlékezet vizsgálatának pszichológiai szempontjai*. ELTE Eötvös K. Budapest. 7–77.
- LANE K.A., BANAJI M.R., NOSEK B.A., GREENWALD A.G. (2007) Understanding and Using the Implicit Association Test: IV: What We Know (So Far) about the Method. In: Schwarz N, Wittenbrink B, (eds.) *Implicit measures of attitudes*. New York NY: Guilford Press. pp 59–102.
- MESSNER, C., VOSGERAU, J. (2010) Cognitive inertia and the Implicit Association Test. *Journal of Marketing Research*. Vol. XLVII, 374–386.
- MIERKE, J., KLAUER, K. C. (2001). Implicit association measurement with the IAT: Evidence for effects of executive control processes. *Zeitschrift für Experimentelle Psychologie*, 48, 107–122.
- NOSEK, B.A. (2007) Implicit-Explicit Relations. *Current Directions in Psychological Science*. Vol. 16. 2: 65–69.
- OSGOOD, C. E., P. H. TANNENBAUM, G. J. SUCI. (1957) *The Measurement of Meaning*. Urbana: University of Illinois Press.
- RYDELL, R.J., MCCONNELL, A.R. (2006) Understanding implicit and explicit attitude change: A system of reasoning analysis. *Journal of Personality and Social Psychology*. Vol. 91, 6: 995–1008.
- <https://implicit.harvard.edu/implicit>