APPLIED PSYCHOLOGY IN HUNGARY

NATIONAL MEMORY: EMPIRICAL STUDIES ON THE MENTAL REPRESENTATION OF HUNGARIAN HISTORY

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INTRODUCTION

The journal *Applied Psychology* considers it as its duty to publish the most recent results of research received by Hungarian psychologists regularly, not only in Hungarian, but also in English, to enable the international scientific community to access these results. In 2011, it became possible to publish the achievements of one research workshop: The teachers at the Institute of Psychology at Debrecen University conducted coordinated research under the title *National Memory: Empirical Studies on the Mental Representation of Hungarian History*. It is an especially valuable feature of this research that it is embedded in a similar interdisciplinary cooperation of Debrecen University within the organizational framework of the Faculty of Arts and Sciences, with a financial support of TÁMOP under the indicated grant number.

National identity and national attitudes (not to talk about national stereotypes) have an abundance of publication output in the international psychological literature, however, rare is the cooperation where psychological questions and research findings are phrased and shown within the framework of an interdisciplinary research strategy. It is a related differential feature of the national memory research in Debrecen that it utilizes the methodological values of cognitive approach while remaining open to studying emotionally toned experiences. The rich variety of approaches and topics ranges from the recent trauma of the red sludge disaster to the highly mathematic description of knowledge space, and the members of the research team do not miss the – in this respect inevitable – role of schools in the formation of the representation of Hungarian history.

While this research team enriches the study of national-historical memory with new and varied aspects, it does not stand alone in the field of Hungarian social psychology: The national attitude and stereotype studies at the psychological and sociological institutes of Eötvös Loránd University starting at the Research Institute of Mass Communication in the 1970s, or the relatively new shoot at the University of Pécs, utilizing the viewpoints and methods of narrative psychology in studying the characteristics and components of national consciousness have long been present and have long received publicity. Most of the results of these schools are available in English for the international scientific community as well, complemented now by the first results of the Debrecen team in *Applied Psychology*.

It cannot be considered a coincidence that Hungarian social psychology deals with the various aspects of national consciousness so ambitiously and in so many ways: Evidently, it has been motivated by the sensitivity and susceptibility of this social environment towards the problems of the nation. This direction of public thinking evidently derives from the facts that *a)* Hungary woke again to national consciousness within the frames of the "Soviet block", limiting and restricting her national independence (after the oppression and dumbness subsequent to the world-famous 1956 revolution), *b)* after the change of the political system,

Hungary chose the European way of democratic development and joined the European Union within the frames of national sovereignty she had been missing for long periods, *c)* more recently, Hungary has been experiencing the contradictions of integration and world economic challenges as a member of the new international community. These historical circumstances give a special tint, and, from the perspective of the interested foreign specialists, individual characteristics to the psychological research of Hungarian national memory.

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György Hunyady
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SUBJECTS OF HUNGARIAN CULTURAL MEMORY IN IMAGES

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ABSTRACT

In our study the participants made a composition out of a set of photos representing significant Hungarian symbols, personalities, traditions, artefacts and sites, as if the composition was the cover page of an album about Hungary, devoted either for foreigners or for Hungarians living abroad for a long time. They worked in groups of three.

The set of photos was created based on the results of a preliminary study asking people about for themes of the utmost importance in such an album. The participants filled in the value survey (PVQ) of Schwartz before the group-work.

Our results support our expectations based on the theory of social representations according to which people differentiate between their communication towards an out-group and an in-group member. The study called attention to the strong value expressive nature of culture-related communication which prevented the participants from presenting culture in an instrumentally effective way. This value expressive feature of culture-related communication was also reflected in the central position of national symbols in the montages, especially typical of groups of people with traditional values.

Key words: social representation; traditional values, self-presentation, self-expression

1. Introduction

Studying cultural memories usually means studying verbal manifestation of culture, appearing either in narratives, novels or in answers to questions in questionnaires. At the same time cultural references have been formulated more and more often in terms of visual manifestations nowadays. Just think of the large number of albums and films presenting cultural and natural heritage of a country or a smaller region to the audience. One can recall several advertisements persuading for the consumption of good-quality national products, or, in case of Hungary, the carpet with the images of prominent Hungarian characters, sights, products, and symbols, led down on the corridor in the Centre of the European Union during the time-interval of the Hungarian presidency also could be a good example for visual communication.

This duality offers a trivial study question: Is there any difference in the distribution of potential themes when people report verbally about the most significant memory places representing one's culture and when they turn to pictures for expressing this same thing? To study this question we turned to verbal and nonverbal answers from two comparable groups of participants. We either asked people to report themes of utmost importance in a photo-album about Hungary or to make a composition out of a set of photos representing significant Hungarian symbols, personalities, traditions, artefacts and sites as if the composition was the cover page of an album about Hungary.

The theory of social representations underpins the social nature of representations which means that true meanings in the communication are not approachable from outside, without sharing common experiences and perspectives with the members of the specific social group or community (Moscovici, 2002/1984). This notion outlines important considerations for studying cultural memory places. A somewhat similar phenomenon has been revealed by the social constructionist stream of research when communication with material objects was in the focus: One's style of clothes, haircut, colours of dresses, design of implements and furniture (etc.) have special self-expressive messages for one's own social group, and vice versa, these messages are coded best by those people who are addressed (Dittmar, 1992; Lunt & Livingstone, 1992).

Our second study question is posed relying on this social (cultural) layer of communication. To what extent do people differentiate in their communication towards in-group and out-group members when they convey culture-relevant messages (in our specific case pictures)? Developing a positive representation of a culture in the eyes of foreigners is a very demanding task in our global world, it is important to show the favourable face. Tourism competes for the attention of international tourists, the economy for international investors, researchers for work-partners, etc. Visual communication is a very natural channel for this purpose. However, recalling nice moments from the past with the help of a photo-album is a quite usual activity in one's own group too, serving the function of strengthening group cohesion.

Consequently, in our study the activity of making a composition out of a photo set of significant subjects of Hungarian cultural and natural heritage as if the composition was the cover page of an album about Hungary, was accomplishable with equal ease either with the

instruction that the album was devoted for foreigners or for Hungarians. Comparing the compositions offers good opportunity not only for comparisons of the ways people address an in-group and an out-group member of their cultural community, but we can get impressions about the laic wisdom in visual communication.

Attitudes toward cultural memory places can be influenced by such individual differences like the hierarchy of personally important values (Pántya, 2010). The challenge of developing a positive representation of one's own culture can mean quite different appeals for an individual with more traditional values and for somebody with less traditional values. Presumably, the former one is motivated by the wish of expressing national cultural heritage while the other one would like to advertise the country as a desirable place in terms of universal measures. We can test this supposition in the study. Furthermore it will be possible to look for the impact of the personal hierarchy of values on the distinction between communicating towards an in-group and an out-group member of the culture.

2. Introduction

2.1. The social representation theory in the context of collective memory

The argumentation of the social nature of memory was introduced to the sociological vocabulary by Maurice Halbwachs (1877-1945) who adopted Emile Durkheim's central dictum of the social origins of memory. According to Halbwachs the collectively manifested and shared past is assumed to serve the expression of collective identity and support solidarity.

Collective narratives represent essential attributes of the community (who they are, where they come from, etc.) and maintain a kind of continuity. The main function of remembering is to promote a commitment to the group by symbolizing its values and aspirations and not merely to "report" the past.

Although the activity of remembering takes places necessarily on the individual level as a brain function, collective memory is always socially framed. What is remembered is profoundly shaped by 'what has been shared with others'. Even one's most private individual memories derive from specific group context (Bernáth, 2010; Halwbachs, 1950/Misztal, 2003; Hunyady, 2010; Pléh, 1999).

Theory of collective remembering is not a distant construction from the theory of social representation laid down by Serge Moscovici who also referred the concept of "collective representations" from Emile Durkheim but stated that representations have a more specific social level, having their roots in interactions.

According to Moscovici people can approach socially relevant subjects with the help of social representations which are formed in the communication between the members of the community. The socially formed representations necessarily reflect the identity of the group and some special meanings of collective representations that can be grasped only by in-group members (Hunyady, 2010; Moscovici, 2002/1984).

2.2. The social characteristics of view

Studies inspired by the theory of social representation are relying on content-analysis of texts such as interviews, social interactions, articles, novels, etc. But societal, economical and cultural changes in the consumers' societies draw the researchers' and professionals' attention more and more on the criticality of social aspects of the information mediated by visual communication. As consumption became specialized, consumers' decisions are not just based on the basic function of the products; we buy symbols, group memberships and feelings too. The advertisements helps a lot in deciding what to buy while they are mediating not (only) the basic features of the products but these special symbolic characteristics. Based on the highlights from the background marketing studies they are cautiously tailored for "people like us" belonging to that group or social class which can be addressed by the specific visual expressions (Babocsay, 2003).

Approaching consumer goods as images is present in economic psychology besides marketing; it also exists in the research field interpreting psychological functions of possession on a social constructionist basis and considering consumption as a mean of self-expression. According to this notion possessions say a lot about the owner. Our clothes, jewels, articles of everyday use, decorations of our houses, etc. mediate our values and lifestyle for others. These messages are addressed to (and decoded best by) the members of our in-groups or classes, perhaps for the members of the desired one (Dittmar, 1992; Lunt & Livingstone, 1992).

According to our point of view, the identity in respect of national identity is manifested in the visualization of important images of cultural memory. Possibly the denotations forwarded to in-group members differ from denotations forwarded to out-group members, similarly when the members of a sub-culture wear different clothes for their private event, than for a common one where the participants are from heterogeneous groups.

2.3. Self-expression and self-presentation in communication

Thus people send information about their characteristics via their views, appearance and behaviour and these sources are meaningful in the eyes of others. Snyder (1974) emphasises the conscious segment of this functioning using the term *self-monitoring* relating to the extent people are concerned with impressing others. Human beings differ substantially in this respect. High self-monitors bother much about self-presentation and receiving positive feedbacks on their personality. Low self-monitors tend to exhibit their own attitudes, values, and internal states as the most important to them is to express their true selves.

Not only individuals but also situations differ in respect of need to express true messages. There are cases where self-expression is more important. In an in-group context where all people in the group know everybody self-presenting might seem as overacting. On the contrary if one faces a big audience self-presentation is adequate and the actor should behave in a manner highly responsive to social cues to impress other people. Interestingly people search for situations fitting their personality in respect of self-monitoring and they find them (Snyder, 1991).

Therefore the question arises whether people can adjust to the requirements of situations when they express or present their national cultural and natural heritage. Do they impress

efficiently the foreigners with the attractive and popular aspects of the heritage? Or do people supply them with historic and symbolic references which are effective in expressing cultural values but at the same time they are difficult to understand for a foreigner?

2.4. Traditional values and their relevancy in studying collective memory

Psychology has to accumulate information about what is really important for people in order to understand human actions, thoughts and emotions, and also to understand motives behind them. The concept of values regards these issues (Higgins, 2007). Higgins (2007) based on the notions of Rokeach and Merton defines values as desirable objectives and end states, and also desirable procedures for reaching them. Among other things (e.g., experiences or need satisfaction) he specifies shared beliefs and norms as sources of values.

The aforementioned notion of values is comparable to Schwartz's value concept: he specifies values as desirable goals that transcend situations, and their relative importance guides behaviours either on the individual or on the social level. During the research of universal values he distinguished 10 motivational types of values and assumed dynamic relationship between them. This assumption is based on the conception that psychological, social and practical consequences of actions taken in favour of realizing any value types can be either compatible or incompatible with each other. Thus this value structure can be perceived as a pattern of compatibilities (in case of types of values with similar motivational bases) and conflicts (in case of types of values with competing motivational bases) among different value priorities. The 10 motivational value types can be presented in a circle along two bipolar dimensions (as higher order value types) where competing values can be found on the end points of these dimensions. These two bipolar dimensions are as follows (examples for value types are shown in parentheses): openness to change (e.g., self-direction) *vs.* conservation (e.g., tradition or conformity); and self-enhancement (e.g., power or achievement) *vs.* self-transcendence (e.g., benevolence) (Schwartz, 1994, 2007).

Conservation includes the following three basic value types: *security, conformity* and *tradition*. These types of values share common motivations such as subordinating the self in favour of social expectations or preserving traditions and status quo. The value type of tradition has a special relevancy in our study as this value type includes particular values which emphasize the acceptance and respect of cultural, religious and/or family customs and traditions and commitment to them (Schwartz, 1994).

3. THE STUDY

3.1. Research questions and hypotheses

One of our questions regarded whether different modalities of perception and elaboration affect the availability of specific memories, in other words do different channels of responding (verbal and visual) have effect on the focus of selection from memorable symbols, characters, natural sites, buildings, traditions etc. In connection with this research question we had no special expectation.

We had expectations regarding the accommodation with the way of presentment to the target person of the interpersonal communication, i.e. we expected people to emphasize different contents for an in-group member and for an out-group member. We consider that as people and situations find each other (Snyder, 1991) situations and attitudes also find each other; situations supporting self-presentation trigger self-presentation tendencies on an instrumental basis, while situations necessitating self-expression evoke value-expressive tendencies on a self-expressive basis. According to our hypothesis the differences of target group of the communication result observable differences in the selection of pictures: references meaningful only for the members of the in-group will be applied more likely in the messages composed for the in-group members (Dittmar, 1992; Moscovici, 2002/1984).

Moreover respect of traditions as a conservative value is expected to have an effect on what an individual communicates regarding Hungarian nationality. According to our expectations the more someone respects the traditions, the more s/he will emphasize the historical-cultural and symbolic aspects regarding the past and the nation, by which people express the continuity of past and the present and the importance of the national-cultural transmission (see Halbwachs, 1950/Misztal, 2003; and Schwartz, 1994).

3.2. Method

Sixty participants took part in our study in 20 groups (3 persons per group). At the beginning of the study every participant filled in a value survey alone; this survey was the shortened version of the Portrait Values Questionnaire (PVQ21 – Davidov, 2008; Schwartz et al., 2001). Compared with the earlier value questionnaire (SVS – Schwartz, 1992, 1994) PVQ is easier to fill in because it requests a less abstract task from the participant who has to make decisions on a 6-points scale about the perceived similarity between him/her and a person described (i.e., portrayed) shortly in 2 sentences per items. These portraits represent the main features of the 10 basic types of values.

After completing the value questionnaire participants were informed that they got a new task which should be completed in groups, therefore we asked them to form groups of 3 based on their randomly assigned alphanumeric codes (these codes were handed out at the beginning of the session). We informed them that their task would be to prepare an A/4 sized photomontage from a certain set of photographs which montage would be used later as the cover of an album about Hungary. We chose the group activity as the main form of our dependent measures because we assumed that investigated phenomena relating to cultural-national memory would be emerged more likely if we offer a social rather than a merely individual context for the mentioned activity. Furthermore we use a manipulation in the design regarding the recipient of the photo-album: the photomontage was edited by 11 groups with the aim of addressing a compatriot now living abroad, whilst the other 9 groups edited it with the aim of addressing a foreign person (a friend) who would like to know more about Hungary and Hungarian people.

The set of photos – which served as the source of images to select from – were made up from the experience of a preliminary study (described in the next section). Our goal was constructing a photoset which offers various topics but at the same time it is still manageable

in its size. The number of the topics was limited to 28, but a topic (e.g., the Parliament) was offered in 4 different forms: we used a typical and an atypical visualization of a subject both in a small (5x7 cm) and in a big size (7x10 cm). With this variety our intention was to increase the interest and excitement in the creative process of composing the montage, and on the other hand, the size and the typicality of the images have special relevancy regarding our assumptions: a topic can be emphasized more or less with the size of the image, while by choosing an atypical rather than a typical representation one can exclusively address an in-group member.

3.3. The preliminary study and the collection of the pictures used in the study
Thirty-six persons took part in the preliminary study. Each of them had to imagine that s/he is a member of an editorial board which edits an album about Hungary illustrated with many pictures. They had to mention during the interview 20 topics of utmost importance to be included in this book. We arranged the participants answers into categories according to their subject (characters and persons, national symbols, landscapes and natural environment, buildings and other artworks, lifestyle), and we calculated the percentage of the answers from different categories. Next we translated this proportionality to a limited number of pictures (up to 30). Then the supply of the 28 subjects was developed, considering that the number of the pictures in a category can be only a whole-number. Finally the number of the subjects in the different categories was implemented with topics raised most frequently in the preliminary study. In case of characters and persons the set of subjects consists of Sándor Petőfi, Lajos Kossuth, Albert Szent-Györgyi, the Hungarian water polo team and the famous composers of Béla Bartók and Zoltán Kodály. (See the Appendix for the detailed list of categories and subjects!)

The final step of the process in inventing the set of photos was searching for typical and atypical visualisations of the subjects on the internet. Moreover two independent persons evaluated the photos in respect of ordinariness. In case of not giving corresponding answers about a picture (consistent with ours), we rejected to use of that photo.

3.4. The results
Both the task used in the preliminary study and the preparation of a montage seemed to be interesting for the participants as they get largely involved in these activities. In the preliminary study we experienced that the personal activity often spread to groups or families who discussed their opinion, and tried to develop corresponding evaluations. These observations led us to the conclusion that it is worth considering applying the task of montage-preparation as a group task.

Before presenting the specific results on the hypotheses, it is worth to note the list of the subjects with more than a three-quarter appearance on the montages. Tokaji wine and Hungarian goulash were presented in all the 20 montages, the national flag in 18 cases of the 20, The Royal Crown in 17 cases, while Sándor Petőfi, the Parliament, the Rubik's cube, and the Chain Bridge appeared fifteen times. It is noteworthy that there are no landscapes among the most popularly chosen pictures.

3.5. Results of preliminary and main study

There were more subjects from the category of landscapes and buildings and less subjects from the category of symbols and lifestyle mentioned in the preliminary study compared to the main study. Characters appeared in the two studies with identical relative frequency (*Figure 1*). We found significant difference between the preliminary and main study in case of symbols, landscapes and living style (Mann-Whitney probe; $p<0.01$). There were a marginally significance in case of buildings, too (Mann-Whitney probe; $p<0.1$).
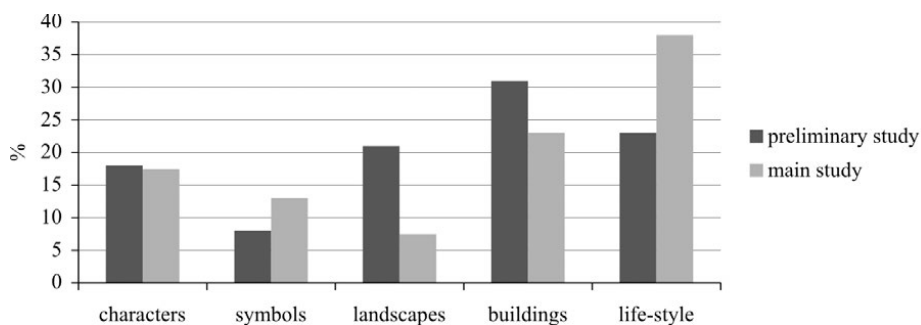

Figure 1. Frequencies of appearance of subjects from different categories in the preliminary and the main study

3.6. Differences between montages

Regarding our *Hypothesis 2* we presumed that participants adjust their choices to the instruction offering numerous attractive sights to see and experiences to try to an out-group member and supplying the in-group member with lots of symbolic and historic references. Surprisingly the montages based on the different instructions were not significantly different thematically. Moreover we cannot find differences on a broader base (landscape, buildings and life-style merged and the remaining categories merged). The montages based on the in-group instruction contained subjects from the categories of landscapes, buildings, life-style with the rate of 71.97% (SD=9.37%) while montages prepared to a foreigner with the rate of 65.29% (SD=15.12%).

Nevertheless one can find differences in the appearance of specific subjects, like in the case of the Parliament which appears on all the montages if they are prepared to a foreigner, while only in half of the cases when the montages are composed to a Hungarian (Fisher-test, $p<0.05$). The theme of the rangeman with a horse was applied only once in a montage to a Hungarian, while it appeared in almost the half of the cases in a montage to a foreigner (Fisher-test, $p<0.05$). That was the case with the theme of Bartók and Kodály with the little difference that they were let in the montage prepared to a Hungarian twice (Fisher-test, $p<0.1$).

There was also a considerable difference in the application of images presenting Hungarian folk-dancers and people wearing Hungarian national dresses. The theme of folk dance was much more frequent in the montages meant to a Hungarian (with 9 appearances out of 11 contrasting the 2 ones out of 9; Fisher test, $p<0.05$), while displaying the national dress

was more frequent in montages devoted to a foreign friend (with 8 appearances out of 9 contrasting the 5 ones out of 11; Fisher-test, $p<0.1$).

Furthermore more atypical pictures (mean=21%, SD=9%) were displayed to a Hungarian, than to a foreign friend (15%, SD=9%) however this difference does not reach the threshold of significance ($t=1.37$, $p=0.18$). Notably the application of atypical visualization is relatively rare, in general.

3.7. The role of individual value priorities

We formulated assumptions also about the role of traditionalism in the chosen communication form about our nationality. We assume that groups formed by participants with higher level of traditional values would prepare montages with using more symbols (e.g., national flag, cockade, the royal crown) and historic characters, while groups with lower level of traditional value priority would prepare montages with using more sights (e.g., landscapes, buildings) and experiences (e.g., culinary images). The type of the recipients (i.e., compatriot or foreigner) and its impact on the montage preparation was also handled.

The ANOVA-analysis resulted in no significant effect in this respect: neither the instruction, nor the group mean of the relative importance of traditionalism influences the thematic composition of the montages, and there was no interactive effect of the two variables.

Nonetheless value priority influenced two variables: the distance of the symbols from the centre of the montage and the ordinariness of the montages. The distance was measured by the distance between the centre of the montage and the centre of the symbolic image that was placed the closest to the centre of the image. It deserves attention alone that in average this distance is smaller than the one-third part of the maximal possible distance (M=28%, SD=22%), which shows that symbols are placed in the middle part of the montages frequently. According to the ANOVA-analysis where distance served as dependent variable, distance was considerably reduced by *traditionalism* (F [1, 18]=8.28; $p \leq 0.05$), but neither was influenced by the *instruction* (the type of recipient), nor by the *instruction* x *traditionalism* interaction. That is, the more the groups emphasize traditional values, the closer they place national symbols to the centre of the montage.

Ordinariness expresses the extent a montage is similar to an average montage from the sample. A percentage was determined in case of every topic which represented the frequency of a certain topic on the all 20 montages regardless of the features of its representation form (e.g., size or typicality). Then these percentages for every topic in a montage were averaged. According to the ANOVA-analysis ordinariness was significantly increased by *traditionalism* (F[1, 18]=7.01; $p \leq 0.05$), but neither was influenced by the *instruction*, nor by the *instruction* x *traditionalism* interaction.

4. DISCUSSION

To summarize, in the compositions made out of a set of photos representing significant Hungarian symbols, personalities, traditions, artefacts and sites, sites and artefacts are represented relatively in smaller numbers than they appeared in the verbal answers of the subjects. On the contrary, photos of national symbols and traditions were overrepresented compared to verbal nominations.

The dominance of presenting the Hungarian style of living (see *Figure 1*) can be illustrated with the observation that only wine Tokaji and the Goulash were presented on all of the compositions.

The instruction has had no impact on the number of historical references appearing in the compositions. At the same time, different instructions attracted specific themes with different frequencies. Foreigners were provided more often with the images of the building of the Hungarian Parliament, that of a rangeman in the Puszta dressed in traditional costume, that of people in traditional dresses of Kalocsa and the photo of Béla Bartók and Zoltán Kodály. On the contrary, Hungarian target subjects were appealed more often with the photo of people practicing Hungarian folk dance. In general the participants used typical visualization very often but they applied somewhat more atypical photos approaching a Hungarian target subject. Groups of participants with more accents on traditional values in their value-hierarchy tailored more conventional compositions and emphasized national symbols to a larger extent.

The differences between choices in the preliminary and the main study reflect differences between verbally conceptualized choices among potential subjects of photos and actual choices among photos. In the verbal processing mode, without visual information, the encycopedical knowledge base can be more accessible, and knowledge accessed in school crowds out style of life as subjects of photos. However the strong need for expressing and presenting our way of life is evident from the main study. People do it either when they are expressing their belongingness or when they are attracting foreigners. The basic emotional (visceral) experiences associated with foods and drinks could also be behind participants' choices, while they were instructed to appeal a specific person (either Hungarian or not Hungarian). Furthermore, in the preliminary study participants replied to our questions individually while in the main study they worked in groups of three, and seemingly they were even more involved than participants from the preliminary study. These differences should not avoid our notice when we are trying to explain variation in the frequency of main subject-categories of photos. Irrespective of the true explanation the door for Hungarian foods and drinks to Hungarian hearts seem to be open. Participants have shown the signs of identification and pride in respect of these typical Hungarian characteristics of way of life. It would be informative to study the reactions from the other side.

Relatively rare appearance of landscapes on the montages should be explained, because they were mentioned a lot in the preliminary study. Are the landscapes uninteresting for us, and are they considered to be the same for others? Or can the symbolism of our relationship to the landscapes be hardly represented in a picture? Or were just the collected picture "wrong"?

Notwithstanding both the built and the natural environment can be the source of the personal and collective memory, contributing to development of our personal and national identity (Lewicka, 2008; Medvés & Kovács, 2010). Natural environment has belonged to our living-space since the beginning of the existence of mankind, and because of its relative permanence they carry the marks of the past in the present. Thus we can still observe the relevant effects of the memories regarding the environment (Schama, 1996).

We often use natural environment to carry our national identity, just like in case of Mount Rushmore National Memorial's sculptures (South Dakota, United States) presenting the heads of former presidents of the United States recalling their memory since many decades. In Hungary we can mention the peninsula of Tihany pushing out into the Lake Balaton with the building of the Benedictine Abbey; which foundational certificate is one of our oldest lingual memories. But not just that natural and built environment can be the subject of our memories which was shaped by the mankind. Lots of Hungarians keep visual traces about several places belonging to the World Heritage like the Caves of Aggtelek Karst, or the Puszta in the Hortobágy National Park. In many cases natural landscapes being important for the national identity have as much honor as they are represented in the official currency of Europe, namely the euro coins. We can observe it in case of Slovakia where one of the highest peaks of Tatra mountains (Kriváň), representing the independence of the Slovaks is presented in the 1, 2 and 5 cent coins. Or the highest peak of the Julian Alps and Slovenia, the Triglav is on the Slovenian 50 cent coins.

Presumably Hungary is not a country with the most exotic natural spectaculars. Nevertheless we unquestionably have several original specialties like the before-mentioned Lake Balaton or the Hortobágy; but the importance of the national identification with these landscapes, the feeling of pride toward them and the desire to show them were manifested only in the preliminary study. The reason for not choosing them into the montage requires further empirical experience.

It makes sense that photos which are presented more frequently to foreigners than Hungarians are seemed to be more attractive than increase feelings of belongingness.

Seeing the building of the Hungarian Parliament is a must for a foreigner. The bucolic rangeman in the Puszta dressed in traditional costume can be interesting for a foreigner but is not a part of our life. This argumentation has a very said message for those who salute the heritage of Bartók and Kodály by heart, at the same time fits the truism that "Kodály is appreciated and known more abroad than in Hungary". The pattern of frequencies of photos representing people in traditional national dresses and people practicing folk dance also fits the frame of interpretation. Dancing folk dances is a vital tradition and people share personal experiences coming easily to mind after a reference (seeing the photo of dancers). On the contrary, most people have not ever dressed into a traditional, national dress, whatever fancy, rich and attractive these dresses are. Consequently, folk dance increases the feeling of belongingness in a Hungarian, traditional dresses catch the attention of foreigners.

The need for communicating with the in-group member in a special way, not fully understandable by an out-group member is also reflected in the frequency of use of atypical visualization. However it is surprising how insensitive the participants were to the instructions

when they chose the photos of significant Hungarian characters to present to foreigners without too much chance for being understood. This lack of distinguishing between subjects to convey to a Hungarian and to a foreigner appears not only in the ratio of characters had in the composition but in a more general sense. We expected more "adventures" offered to foreigners and more "memories for remembering" presented to a Hungarian. Specifically, we expected the participants to impress foreigners with scenic sites, famous buildings, highly recommended foods (etc.) and to provide for Hungarian listeners symbolic and historic hints. But the frequencies of photos belonging to these larger classes were identical across the conditions. What an explanation could we find to this pattern?

First, attractive subjects could be thought equally efficient in increasing feelings of belongingness. But the appearance of historic characters and national symbols in the compositions tailored for foreigners questions the notion of functional substitutes.

Most probably, there are subjects in culture-related communication which could be defined as "cultural minimums". On these points people perhaps are reluctant to compromise between expressing values and "selling" adventures. The portrait of Sándor Petőfi is in the composition even if a foreigner is not expected to identify him. As a result, in our specific case this adherence to the expression of historic and cultural values leads to filled areas in the composition leaving limited rooms for "adventures".

Regarding the effect of value priorities on composing montages it is specifically noteworthy that the impacts of groups' mean of individual value priorities were identified. Comparing variables measured on the individual level with each other is common in psychology, but now the case in issue is the effect of groups' mean of individual responses on group production. In our interpretation this effect fits nicely the concept of the social nature of cultural memory (Halbwachs, 1950/Misztal, 2003). Our results suggest that groups high in traditionalism (who emphasized symbols more and compose montages of higher ordinariness) tend to follow a more consensual way of national memory in their cultural references than groups lower in traditionalism. It is interesting that neither of them adjusted their communication "tools" in accordance with the instructions. This result implies that people high in traditionalism can be more successful in increasing in-group cohesion, while people low in traditionalism can be more successful in the various presentations of our manifold values.

Briefly we can say that on the one hand our results seem to support our assumption (which was delineated on the theoretical bases of social representations and social constructionism – Dittmar, 1992; Moscovici; 2002/1984) about distinguishing between the forms of communication of our national memories in the function of the recipients' group-membership. On the other hand our results highlight that handling national memories has such a strong value expression aspect that easily distracts lay people (who are inexperienced in respect of making effective advertisements) from the functional – that is effective and favourable – self-presentation to the out-group. Thus we can say that the self-presenting situation cannot really activate those self-presenting attitudes which correspond to that specific situation. This value expression aspect is supported also by the higher tendency to emphasize national symbols from the part of groups higher in traditionalism.

Finally we would like to specify some of the limitations of our study. First, further data collection would be required in order to enlarge our sample. Furthermore it would be very worthwhile to replicate the procedure of our main study in an individual rather than a group setting in order to define more precisely the features of the effects behind the difference in the ratios of chosen topics emerged in our preliminary and main studies. In the discussion we formulated several assumptions about the effects of the montages also on the side of their recipients. Our results could be also enriched by information about this latter issue.

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Appendix: Topics presented on the images classified by content categories

TOPICS PRESENTED ON THE IMAGES

Characters and persons:
    Sándor Petőfi
    Lajos Kossuth
    Albert Szent-Györgyi
    Béla Bartók and Zoltán Kodály
    the Hungarian water-polo team
National symbols:
    national flag
    cockade
    The Royal Crown
Landscapes and natural environment:
    lake Balaton
    Tokaj-Hegyalja wine region
    The Puszta (The Great Hungarian Plain)
    Hungarian Grey Cattle
    puli (medium-small breed of Hungarian herding and livestock guarding dog)

Buildings and other artworks:

    Protestant Great Church in Debrecen

    Ecce Homo! By the Hungarian painter Mihály Munkácsy

    a Parliament of Hungary

    Chain Bridge, Budapest

    Feszty Cyclorama - Arrival of the Hungarians by the Hungarian painter Árpád Feszty

    Nine Arch Bridge, Hortobágy

    Buda Castle

Life-style:

    Hungarian folk-dancers

    people wearing Hungarian national dresses

    Rubik's cube

    wines from the Tokaj wine region

    pálinka (fruit brandy made in regions of the Carpathian Basin)

    Goulash (Hungarian soup of meat and vegetables, seasoned with paprika and other spices)

    a rangeman with a horse in traditional costume

    Hungarian red paprika

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 construct are overlapping to some extent and the implicit and explicit measurement technics 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 objects 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 technics 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 psycho-physiological 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 colleges 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	-	*Evaluation*	1.	2.
2.	Training – 20	Adjective	-			
3.	Training -20	Name and Adjective	C	*Potency*	3.	4.
4.	Test - 40	Name and Adjective	C			
5.	Training – 20	Name	-	*Activity*	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.
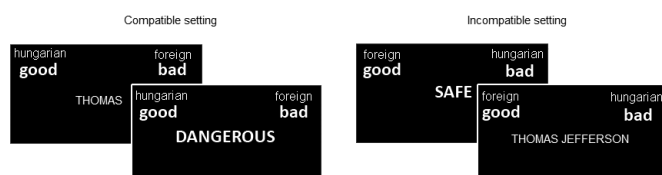

Figure 1. Stimuli setting. The given names (left part of the figure), the historical names (right part of the figure) or the examples for the evaluation dimension randomly appear in the centre of the display. In the left and right upper corner the categories belonging to the Name and Adjective tasks 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 x 3 x 2 x 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 | | | | | |
			M_C		M_I		D		M_C		M_I		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)

Figures 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 to 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].
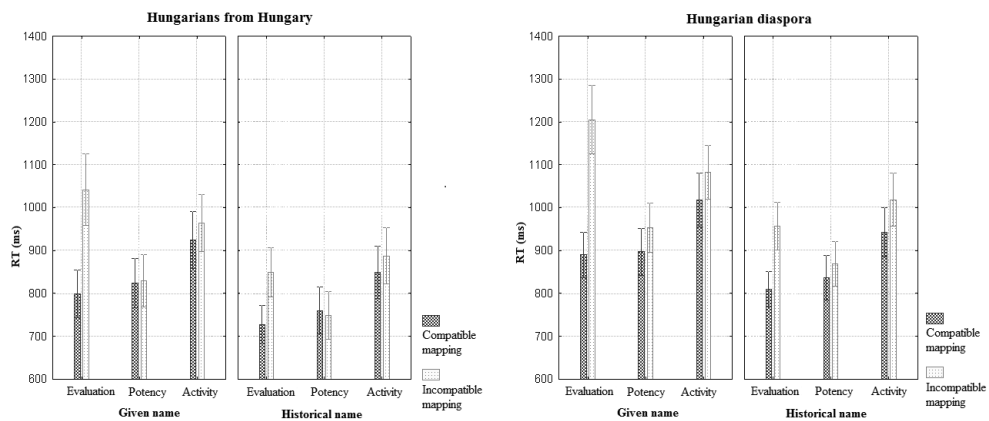

Figure 2. RTs (in milliseconds) and Standard error of the means in case of compatible and incompatible mappings among the Target and Attribute classification tasks separated for the Given Name and Historical name IATs as a function of the semantic dimensions (evaluation, potency, activity) applied in 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.

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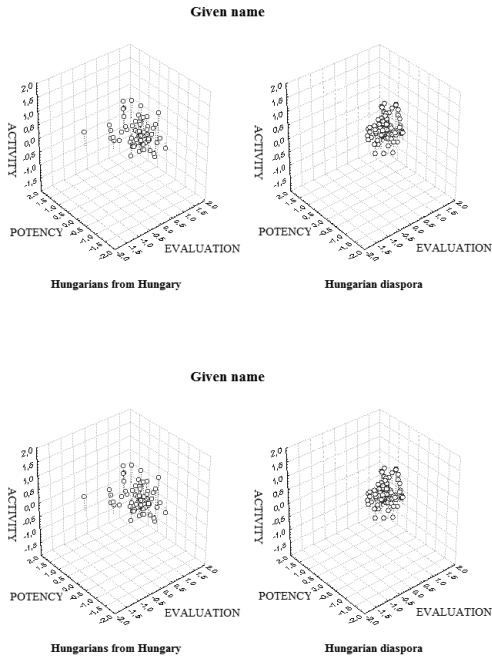
Figure 3. The plots of D scores for each subject in the three attribute dimensions (evaluation, potency, activity) in Given name (upper part) and Historical name (lower part) IATs on the samples of Hungarians and the Hungarian diaspora.
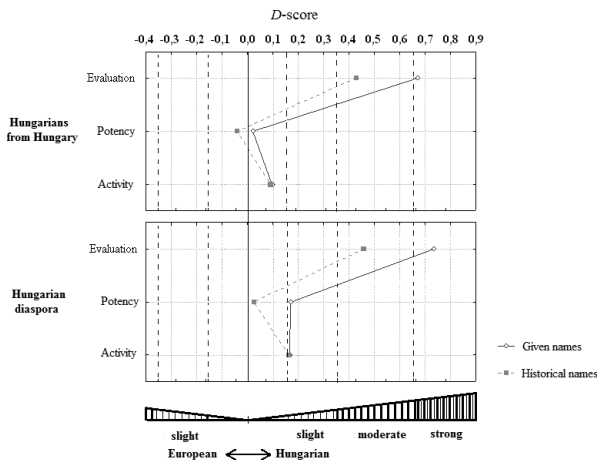

Figure 4. The size of the IAT effect characterized by D-scores in the sub-samples of Hungarian and the Hungarian diaspora in the Given Name and Historical name in IAT as a function of the semantic dimensions of the attribute categorization tasks (evaluation, potency, activity). The positive values represent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

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HOW DO SECONDARY SCHOOL TEENAGERS REPRESENT SIGNIFICANT EPISODES OF HUNGARIAN HISTORY?

A FUNCTIONAL APPROACH

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ABSTRACT

The episodes of key importance in the Hungarian national history are in the focus of the paper, as they are recalled as examples for positive or negative turning points and as they are evaluated on scales. The sample consists of a 100 students attending The Evangelic Secondary School in Aszód. Their responses are in line with the results of former studies in respect of recalling positive examples mainly from the time passed by several centuries and negative examples from the 20th century. Nevertheless, the 1956 revolution and the transition to market economy are definitely represented in the range of positive examples. Representations of the episodes can be assorted not only by the positive-negative dichotomy but by aspects, meaningful in respect of the function of collective memory: sovereignty, unity, credibility. There are several arguments raised in the paper supporting that studying collective memories of national history with the help of scales is as justified as studying it with narratives.

Key words: collective memory; functions of remembering of historic events; evaluations

1. Introduction

All nations and all individuals need knowledge about their past. Like an individual feels personal continuity and identity via remembering of personal memories from one's own past, to develop a national identity needs awareness of the origin and the history of the nation. This knowledge provides the person with significant historic examples and solutions which are helpful in understanding the present; historic examples could serve as a kind of hope in entertaining the idea that "the glory of old times once comes back". Moreover, remembering historic episodes offers the occasion for saluting in the honors to heroes and in general, to cultural heritage. Memories can serve as subjects of criticism, helping us to learn the lesson in order not to commit the same mistakes again.

Knowledge about historic episodes is an ultimately important societal interest because of its identity-formative function. The acquirement of this knowledge goes on at different arenas of socialization: in families and in the schools. Even if the need for modern knowledge caused a dramatic decrease in the volume with which many classic subjects (mainly the natural sciences) are represented in public education, the study hours students learn history (and also Hungarian language and literature) have not suffered a considerable decrease in the last few decades. Secondary school students form a population which – on average – stores the encyclopedical knowledge about the national history the best (Király, 2010), as they had fully went through all the spectrum of national history and actually they are deepening, integrating and fixating their knowledge in secondary school. In this phase, they most probably have not only the knowledge but also the attitudes towards these episodes.

What are the typical negative and positive turning points of our national history in the view of teenagers? What are the dimensions behind their attitudes? How can the most typical episodes be mapped in the space defined by these evaluative dimensions? Can the evaluative dimensions be connected to the psychological functions of remembering historic episodes?

We executed the data collection in two phases. First, the participants freely recalled three positive and three negative episodes from the Hungarian history. Then, based on the results of the first phase, the same group of participants evaluated the 10 (5 positive and 5 negative) turning points on 13 bipolar scales.

Our study has its research antecedents in Hungary inspiring our examination. First, our participants were to recall examples of positive and negative turning points from the national history based on the procedure of a former study (László, Ehmann és Imre, 2002), but asking for three-three examples instead of a single mention of a positive and a negative turning point. On the other hand, evaluation of historic episodes on scales is a method well-known from the work of György Hunyady (2010) and we will relate our findings to his experiences covering a broad time interval.

According to our results the participants showed the sign of turning to the distant past for positive memories to a lesser extent than participants from relevant other studies (László, Ehmann & Imre, 2002; Kinyó, 2005). The tolerant and nostalgic attitude towards the communist regime (Hunyady, 2010) was absent, and the 1956 revolution was definitely represented as a positive turning point. Representations of the episodes were assorted not only by the positive-negative dichotomy but by aspects, meaningful in respect of the function of collective memory: sovereignty, unity, credibility.

1.1. Representation forms of remembering history

On the one hand people know facts about history, and on the other hand they have emotions, feelings, evaluative attitudes towards the events. The factual level relates to the knowledge of "simple" facts, like the date and place of events, the names of significant personalities involved and also relates to the knowledge of more complicated ones, like the context of the event, the motives of the significant actors, the consequences of the action (Abari & Máth, 2010; Kurucz, 2010).

However, not the knowledge representations are in the centre of our study, but attitudes, evaluations, that is, how proud somebody is of an episode of the Hungarian history, how determinative that episode is judged, to what extent it is considered as an episode bringing Hungarians closer to each other, etc.

Knowledge and evaluations are not disconnected. If somebody strongly identifies with a personality of a specific period, or with the spirit of that period in general, most probably needs more and more information about the period, turns to references and reads novels on the subject, etc. The interest motivates the acquirement of knowledge, which is a fun with involvement, and emotions accompanying the knowledge acquirement serve as reinforcement (Zajonc 1997/ 2003).

There is considerable variety in the factual knowledge of people, not only because of the motivational aspects but because of forgetting. Perhaps, only the most important dates, places and personalities should be expected as common cross-section of knowledge. On the contrary to that, in respect of feelings, attitudes and evaluations we can expect more homogeneity, namely because feelings are much less variant than knowledge, and forgetting about feelings, emotions, evaluations is less intense (Zajonc, 2003/1997). Put it differently, after a certain time feelings and evaluations which orientate us in our attitudes compress our knowledge and remind us to it even when the details of knowledge are fading (Lingle és Ostrom, 1979).

It is exactly this relative homogeneity why we took evaluations as our research subject in this study. We were curious about some aspects of cultural memory, what is, by definition, the cultural layer of individual memory, common in all the members of a culture.

Studying representations as they appear in narratives also has its remarkable tradition in approaching cultural memory (Hunyady, 2010; László et al., 2002). The narrative approach is in harmony with the view that what is important in remembering collective (in this case: national) history is not necessarily the true and adequate fact, but personal significance and personal understanding (Nora, 1996). Exploring collective memories via studying representations reflected in narratives is a very rich research stream either in Hungarian or in international context (see for example László et al. 2002; Wertsch, 2003; White, 1981). The results of our attitude-study are to be related to some results offered by the narrative approach.

1.2. Functions of collective memory

Collective memory by definition is the commonly shared collection of memory pieces about subjects of great importance in respect of a group (either interactive or symbolic group) (Assmann, 1999; Kovács, 2010; Nora, 1996). If the members of the "group" add up a nation, the subjects of collective memory are called as "national memory places" in Nora's (1996) terminology. Important episodes of the national history form a subtype of national memory

places. The attitudes and evaluations of important episodes of the Hungarian history are in the focus of our paper. The argument in this block is that general attitude functions correspond to the functions of collective memory, providing a kind of justification for approaching collective memory within the frame of attitude research.

Attitude functions are organized in two basic factors. On the one hand attitudes have a social function, helping people to connect and to adjust to each other. When they express their attitudes in the communication, individuals belonging to groups of common beliefs are identifiable. On the other hand attitudes have an instrumental function helping to adjust to the environment (Smith, & Mackie, 2002).

Attitudes serve the same goals in the specific context of significant turning points of the Hungarian history. They offer themes for experiencing belongingness and developing a common national identity, consequently serve social (national) affiliation and adjustment. Furthermore, the attitudes very often have a moral aspect making memories be subjects of criticism, and helping to learn the lesson in order not to commit the same mistakes again. Moreover, the attitudes can be at people's help in coping with traumatic[1] collective experiences, facilitating effective accommodation.

When recalling collective memories, the members of the group share similar experiences, hence they become bound together by a piece of memory. Although remembering always happens in the frame of individual functioning involving thoughts and emotions, specific memory subjects (or memory places) become reference points in the communication with the in-group members (compatriots in the specific context of national history). Discourses on the national history help to feel belongingness. This social function of narratives is especially remarkable in case of great national narratives (legends, myths, histories about the origin of the nation). Children, as the new members of the community, get the heritage of national community and the national identity via listening to these narratives and experiencing emotions evoked by them (Pataki, 2003).

Besides the search for the feeling of belongingness, the search for a positive identity is also a very important urge in our social life. In the frame of national memory places this refers to the goals of developing a national identity with continuity and with positive attributes. Maintaining and transmitting group identity sometimes result in rewriting of the past. Some stories become redundant from the perspective of developing the national identity. Certain details are enlarged in the collective memory, while others are faded serving the interest of the group. This restructuring is directed by the goal of supporting and presenting the group identity as efficiently as possible (Assmann, 1999).

The need for searching a positive identity is often troubled by the facts. Like discussing negative life events (which evidently implies recalling memories) can help individuals to cope

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[1] This function should be treated in a psycho-analitic context but for the sake of simplicity we do not present attitude functions here in more details where the self-defensive function would get distinct exposition (Katz, 1976). By applying this simplification we adjust for example to the structure offered by Smith and Mackie (2002) in their handbook.

with those events (see for example groups working on traumatic experiences), collective remembering can also help communities to cope with traumatic experiences. On 'traumatic' we mean an event, when the members of the community experience something terrible, that is considered to be unforgettable and impactful on the common future. Collective traumas are represented not merely by their contents, but by the process in which the concerned community is getting to the interpretation of the respective event as threatening the core of their existence (Alexander, 2004).

The representation does not disappear with the generation experiencing the trauma directly; according to Rüsen the following two generations maintain it. The psychological elaboration of the trauma is an ongoing process and dealing with cultural-historic experiences is a form of cultural strategies aiming to survive the traumatic experiences (Rüsen, 2004).

Collective narratives often teach moral lessons with positive and negative heroes, blameless or peccable victims. According to White (1981) historic narratives always offer moral messages which serve as motivating factors behind social activities. As history is always about human deeds, narration of the past offers opportunities to present the purposes behind acts and to report the consequences of these acts. According to Poole (2008) taking the responsibility for the mistakes committed by the community is one of the most important functions of collective memory, which should motivate keeping promises and repairing damages. However, these moral lessons appeal not only our remorse but they also offer positive examples of the struggle for positive national identity.

1.3. Representations of the Hungarian historic eras

As it was mentioned in the introduction, our study can be related to the experiences accumulated within the frames of two differring research streams. One of them is based on the concepts of social representation theory (László et al., 2002), and the other relies on the traditions of attitude research (Hunyady, 2010).

László and his colleagues asked students to write a typical story as an example of positive and negative historic eras of the Hungarian history, and one more story from an era that had impact on one's own family. The most frequently referred positive eras or episodes were the "Settlement of the Magyars in the Carpathian basin", the "Golden Era", the "Era of successful anti-Turkish fights", the "Hungarian Revolution and the War of Independence in 1848-49", together with the relatively rare reference to the "Transition to market economy in 1990". Stories referring to negative eras were taken from the "Era of Ottoman Hungary", from time of the "Fall of the Hungarian Revolution and the War of Independence in 1849", from time of the World Wars or cited the "Treaty of Trianon" or less frequently the "Era of the Soviet occupation". The researchers identified four groups of the observations. They referred to an era or an event where Hungarians: won a fight; first they won but than lost; they lost; first they lost but than won. The relatively rare appearance of stories referring to the positive era of transition to market economy was explained with lack of schemas for this type of category (first we lost but than won). The qualitative content analysis identified the freedom fight and losses counted in lives, values, territories and sovereignity as the core motives of positive and negative examples, respectively (László et al., 2002).

György Hunyady has been studying representations about history for decades. Among many other questions he set those of the content of knowledge, the categorization and evaluation of historic characters, the consequences of cognitive styles on processing history-relevant informations, and the evaluations of the eras of the 20th century (Hunyady, 2010). Concerning objectives and methods our study can be related the most to that latter question. He asked students in 1981 and 1991 to evaluate periods involving 25-25 years of the Hungarian history according to specific attributes. These periods were the era of the Monarchy, the Horthy regime after the Treaty of Trianon, the era of Rákosi, the Kádár-era of consolidation after the fall of the Revolution in 1956, and the transition to market economy. Of course, this latter was absent in the survey from 1981 where the participants found the expression "the society at the end of the century". The whole study was actually replicated in 2000 on a representative sample. The attributes of evaluations captured the notion of advancement, maturity and progressivity concerning the diverse areas of life (living standard, the level of technological development, culture, sports, etc.) The average evaluation stands for the general attitude towards a period which can be related to the other periods' averages. The line drawn by the average attitudes proved to be an upwards line in 1981. In the other two surveys the line appeared to be a U-shaped one with the era of Rákosi evaluated worst. The enjoyable barrack of the Kádár-era was considered neutral in 1991 and even positive with a nostalgic season in the views of people in the representative sample at the end of the century (Hunyady, 2010).

The question arises how the transition to market economy is evaluated by our sample. At all, how strongly the transition is represented among the positive eras. Have people had accumulated schemas to represent "first lost but than won" category in the representation of national history since it was last measured by László and his colleagues in 2002? Do these young Hungarians really consider the disappearance of the communist regime as a kind of lost?

2. STUDY

2.1. Research questions
In the study secondary school students were to judge Hungarian historical events and eras, in order to obtain answers for the following questions:
1. Which events of our history are judged the most negative and most positive? Our expectation was that if the respondents can choose three events, the glorious past is less separated from the sad, or less successful closer past. Since such mapping of the Hungarian history – with extreme simplification – is not far from reality, and fairly prototypical, a more sophisticated pattern of the positive and negative elements can be obtained by allowing three choices.
2. How the participants relate to the most frequently mentioned events in their feelings and in their evaluations? We expect that the positive evaluations of positive events are more salient than the negative evaluations of negative events. In order to create a positive identity the national awareness would find the meaningful aims even in failures, and emphasize the very aspect of negative events that was after all (or obviously) positive.

3. What are the underlying dimensions of the event patterns? Do the revealed underlying dimensions match the functions of collective memory? According to our expectation in the background pattern of the events' representations dimensions that are in line with such functions of collective memory as social orientation, conformity, and belongingness will occur.

2.2. Sample, measures and procedure

The sample consisted of 100 secondary school students from Aszód, with an equal proportion of the genders, from four grades: ninth (N = 27), tenth (N = 20), eleventh (N = 32), and twelvth (N = 21).

The study consisted of two parts. The questions used in the first part were based on the structure of László and his colleagues' (2002) questionnaire study (replicated in 2005 by Kinyó) investigating the positive and negative events of the Hungarian history. However, the instruction in the present study was different, the respondents were asked to name three positive and three negative events, instead of naming just one story. The following instruction was given to the students: "Name three historical events or eras which, in your opinion, were the best, which you are the most proud of, or in which you would have wanted to take part the most!" (1); "Name three historical events or eras which, in your opinion, were the worst, which was the most harmful for the country, which should never have happened!" (2).

The data obtained in the first part of the study provided a good basis for the second part (beyond the results obtained from them). In this second part, the students were to evaluate the ten most frequently mentioned historical eras (five positive and five negative ones) along thirteen dichotomies on a seven-point (from -3 to 3) scale (see the Appendix). These dichotomies let the students express their opinions concerning the events. The analysis of the answers is to reveal the structure that guides the students' thoughts about the historical events that they consider to be important.

2.3. Results

In the first phase the students' answers for open questions were analyzed. In the analysis the first study question was investigated, that is, which events are considered the most positive and most negative by the students. Our expectation was that the possibility of naming multiple events will elaborate the previous results stating that people tend to look for positive events in the far past, whereas negative events in the closer past.

The hundred students named 263 positive events (not everyone named three of them). The answer frequencies of the positive events are depicted in *Figure 1*. The list of positive events that were mentioned at least by 10% of the students starts with the 1956 revolution being the most frequent answer and ends with the transition. (Were the "1848 Revolution" and the "1848-49 Freedom fight" handled as one single event, it would have been on the top of the list). Besides the above mentioned events, the Settlement of the Magyars, the "victories over the Turks", Saint István's founding of the Hungarian state and the reign of King Mathias were mentioned often.

The frequency of the negative historical events mentioned by the students is depicted in *Figure 2*. The Treaty of Trianon has the highest answer frequency, with 59% of the respondents

mentioning it. The frequently mentioned negative events were the Turkish occupation, the world wars, the retaliation of the revolutions and freedom fights, and the soviet era in Hungary. An interesting addition is that the students mentioned examples from their own personal, or their families' history ("Gyurcsány era", political culture after the transition, or the transition itself).
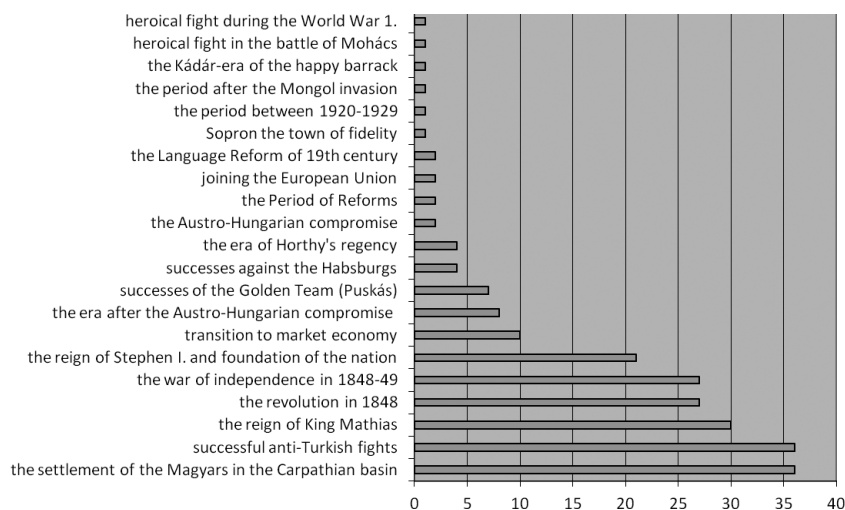

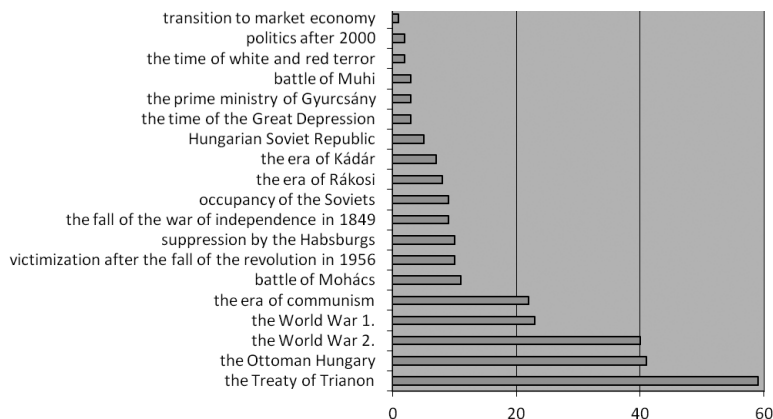*Figure 1.* Numbers of mentioning specific positive events and eras

Figure 2. Numbers of mentioning specific negative events and eras

The events, which were mentioned only in a positive context are all from the far past. The judgements of the events from the era of the great kings till the beginning of the 20th century are ambivalent, whereas the events of the 20th century till the transition are mentioned in an obviously negative context. The only exceptions in this decline of historical events are the 1956 revolution, and as an endpoint the transition. The summary of the data clearly reveal

that there are memories that can be interpreted as both positive and negative. These are usually events, in which the Hungarians endured even in hard times, and – although a foreign power retaliated the endurance – the virtues expressed are exemplary even today (e.g., fight against the Turkish, 1848-49 freedom fight, 1956 revolution).

The results from the first part of the study confirmed the previous findings about perceiving a decline in our history on the one hand, and revealed that the positive events of the 20th century modulate the view of pessimistic perception of history, on the other hand.

In the second hypothesis we expect that the students' attitudes to positive events are more positive, than their rejection of negative events. In the second part of the study the students evaluated ten historical events along 13 dimensions. These events were listed in a chronological order: "The settlement of the Magyars in Hungary", "The era of Mathias", the "Turkish occupation", "1848-49 revolution and freedom fight", "Hungary's involvement in World War 1", "Treaty of Trianon", "Hungary's involvement in World War 2", "1956 revolution", "Transition to market economy". There were certain evaluative dimensions that do not measure attitude, like how authentic the sources about an event are, how determining the event was, how much it influenced the Hungarians' future, whether it is evaluated the same way by the different generations, whether it influenced the respondents' or his/her family's life. However, there were eight dimensions referring unquestionably to emotions and positive-negative evaluations. These are the following: brought something new, some development for the Hungarians; positive event in the Hungarian history; I wish I had participated in the event; contributed to the Hungarian awareness; proved that Hungarians are fond of freedom, it was worth fighting; revived the awareness of national belongingness; I am proud it had happened.

The mean of the evaluative judgments are depicted in *Figure 3*. The mean of the positive attitude toward positive events is more salient than the mean of the negative attitude toward negative events. The mean of the positive answers for positive events was 1.51, while the mean of the negative answers for negative events was -0.81. The absolute value of the two means was statistically significant ($t = 9.81$; $p < 0.001$).

The third set of questions was about the dimensions creating the patterns of the events, and whether these dimensions can be matched with the functions of the collective memory.

As a first step, a factor analysis was performed on the 13 aspects for all the 10 events, in order to find the aspects that load consistently, for all the ten events, on one single factor. Two connections were found that showed such consistency. One of them was between *credibility* and *determinative feature*, the other one among *Hungarian awareness*, *freedom loving*, *struggling* and *belongingness.* The mean of the answers in these factors will be referred to as *origin,* and *belongingness*. Origin has been chosen, because to experience identity one has to have credible sources about the determining, significant events. Like someone would get an existential crisis learning that the indentifying documents of his/her life are fake, the community would also suffer a crisis should the information about the determining events turn to be uncertain. When choosing the label belongingness we have simply chosen one of the items belonging to the factor, which may serve as a keyword representing the freedom loving, struggling, Hungarian with a definite national identity.
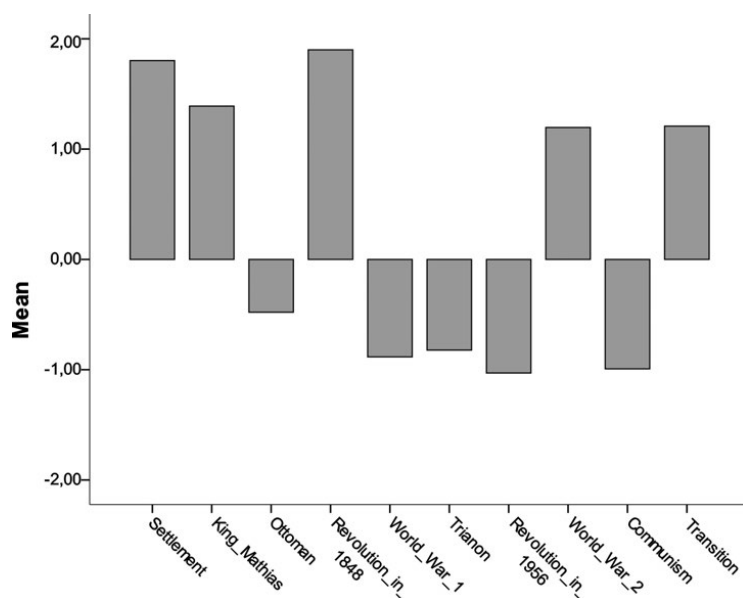
Figure 3. Mean evaluation of the events and eras

In the further analyses multidimensional scaling (MDS) was performed in case of origin, the nation's fate (belongingness), and pride (which was an independent question among the evaluations).

The scaling resulted in a god-fitting two-dimensional model in case of origin (Stress = 0.05, RSQ = 0.98). Based on the setting of the events, the meanings attributed to the underlying two dimensions are *legend* versus *fact* on the one hand, and *agreement* versus *ambiguity* on the other hand. King Mathias' unanimously evaluated legendary figure, the story of the Settlement of the Magyars known from legends, involving uncertainty, the contradicting personal stories about the socialist era and the lot of knowledge and social consensus about the 1848-49 revolution and freedom fight can be identified as defining points in this pattern. *Figure 4* shows the relative positions of the events along the two dimensions. *Figure 5*, on the other hand, shows the evaluations in an absolute sense. As far as origin is concerned, Figure 5 contains only positive evaluations, the participants believe in the social interpretations of our important events, they consider these as proven.

The multidimensional scaling revealed two dimensions in the background of the *belongingness* feelings of the events as well (*Figure 6*). The scaling resulted in a good-fitting two-dimensional model also in this case (Stress = 0.04, RSQ = 0.99). The setting of the events suggests *positivity* and *similarity* in the Hungarian people's fate at the time of the event as the interpretation of the underlying dimensions. On the right side of Figure 6 there are mainly positive, whereas on the left side there are mainly negative events. Along the vertical axis different fates of the nation disintegrated by the Treaty of Trianon, the trisected country (Turkish occupation) and the country extruding compatriots because of racial discrimination are contrasted with the fates of the socialist era perceived as homogeneous, and the consistentlyemployed justice known from the tales about
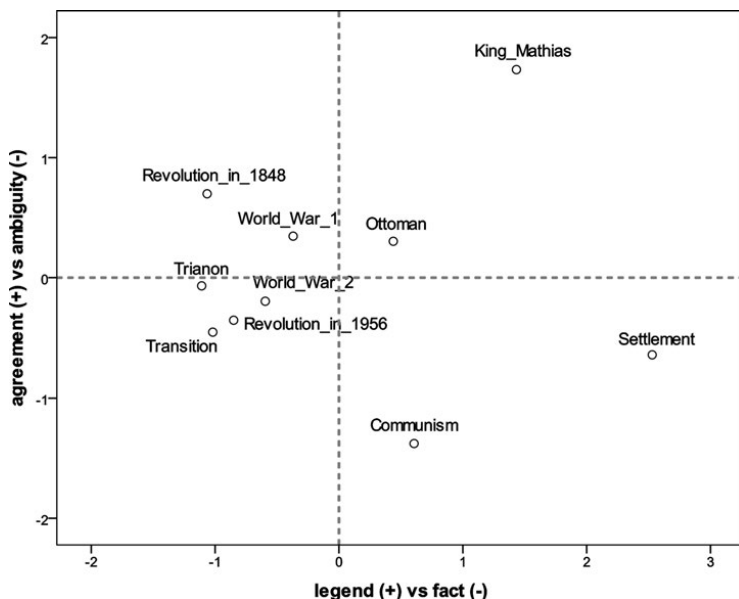
Figure 4. Dimensions behind origin and the events and eras in the two-dimensional space
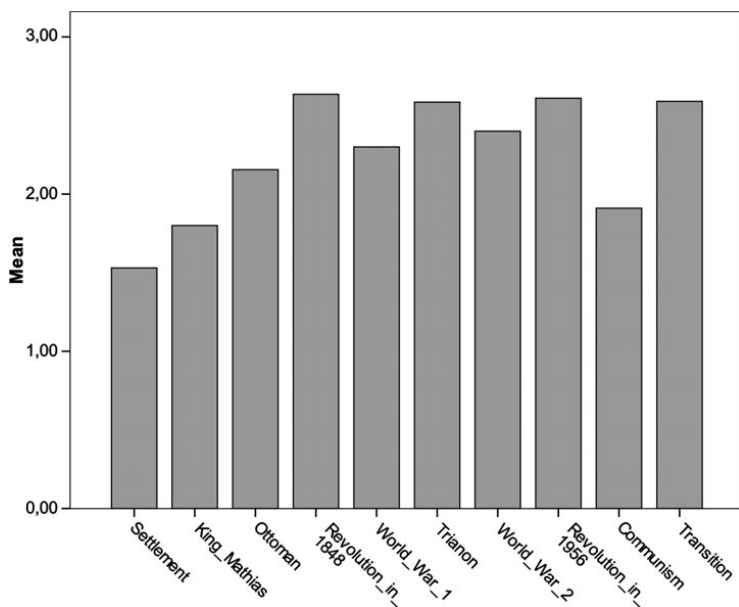

Figure 5. Mean evaluation of the events and eras in respect of credibility

King Mathias. On *Figure 7* the mean values of the evaluations are depicted. According to the students' evaluations the nation's belongingness was more reinforced than deteriorated by basically every event, no matter if it was positive or negative, unifying or divisive.
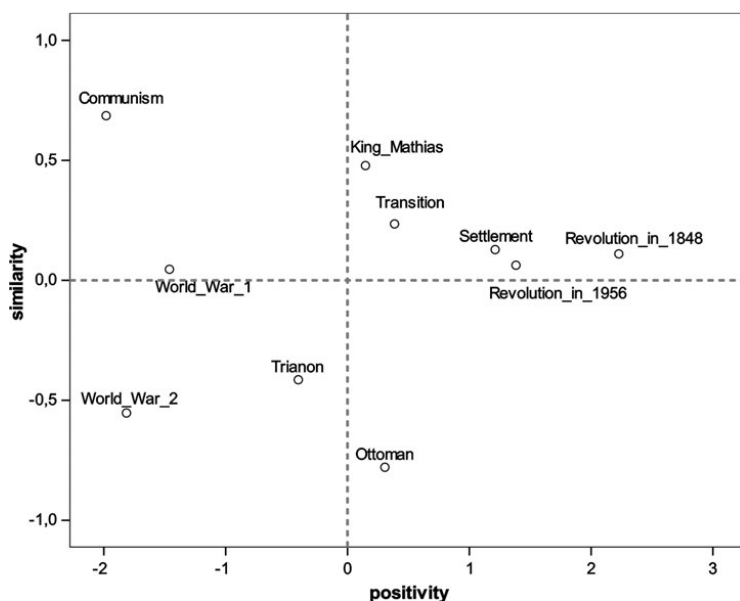
Figure 6. Dimensions behind nation's fate (belongingness) and the events int he two-dimensional space
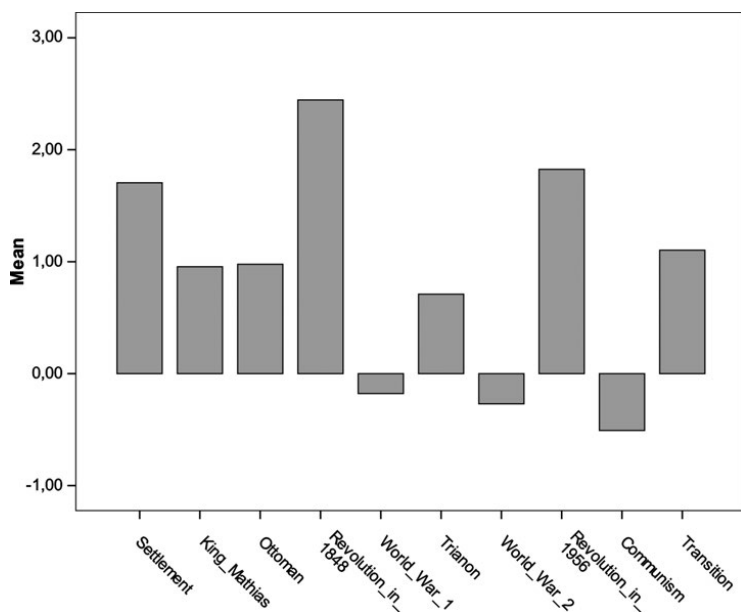
Figure 7. Mean evaluation of the events and eras in respect of nation's fate (belongingness)

Finally, a multidimensional scaling was performed for the feeling of pride (*Figure 8*). The fit of the resulting two-dimensional model was good again (*Stress* = 0.02, *RSQ* = 0.99). The underlying dimensions were labeled as *positivity* and *sovereignty*. The latter refers to what the students think of the political sovereignty of the country characteristic of the era. The

most salient subjection is perceived for the socialist era according to the respondents. This is opposed to the independence of the country changing regime, and the country choosing its allies in a sovereign way when getting involved in World War 1. Concerning pride the events are evaluated corresponding to positivity (*Figure 9*).
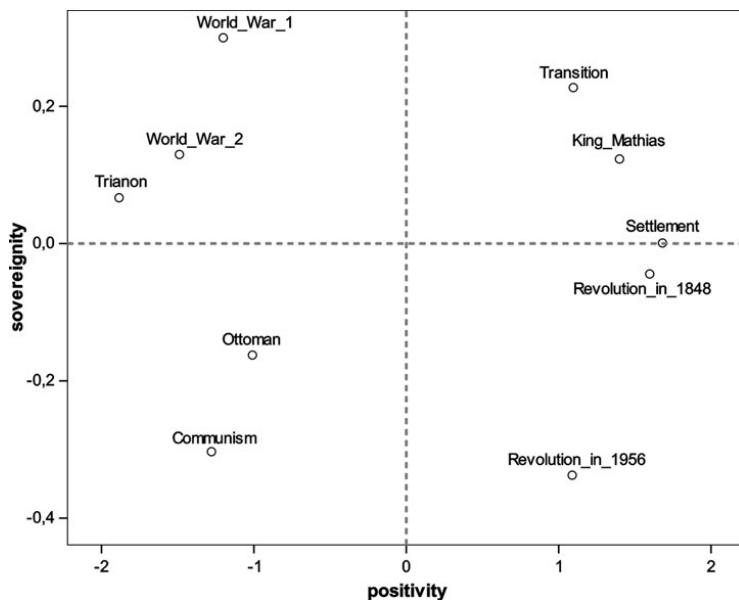

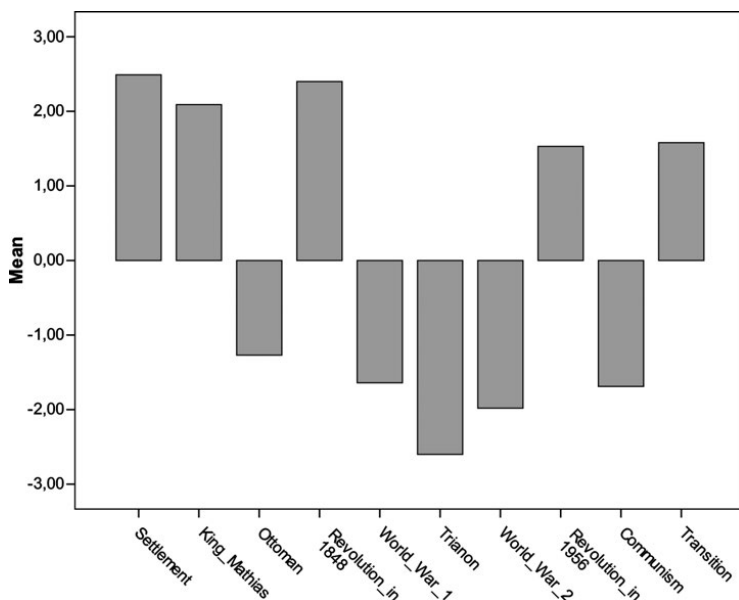*Figure 8.* Dimension behind the pride and the events and eras in the two-dimensional space

Figure 9. Mean evaluation of the events and eras in respect of pride

3. DISCUSSION

At the beginning of the discussion, a brief summary of the results is given. The most noticeable result from the first part of the study was the pretty easily available positive representation of the 1956 revolution in the memory of the respondents about the national history, and the, though less representative, but present positive accessibility of the transition. The list of the most frequently recalled negative events is in line with the previous findings. The positive attitude towards positive events is stronger than the rejection of the negative events. The interpretations of the events are observed, beyond the positive-negative aspect, along the origin and the belongingness aspects as well. Further dimensions in the background of these interpretations were identified as factuality, analogy in the nation's fate and sovereignty.

That is, in the present study there was a significant difference in the evaluation of the 1956 revolution and the transition, as compared to previous studies. While in László and his colleagues' 2002 study less than 8% of the respondents mentioned the 1956 revolution or the transition as a positive event (this proportion was less than 1% in Kinyó's 2005 study), in the present study these answers represented more than 18% of the answers, and almost half of the respondents mentioned at least one of these events.

The question is what causes the difference. Is it the difference of the data collection or the difference in the sample, or is it the time passed between the studies? Could it be that 1956 is not to be mentioned in first place because it is not the prototypical good answer for the "positive event" (for that, events that are successful in every aspect are better, because the revolution was defeated), but the evaluation of this event along freedom, struggling and belongingness makes this answer as a good second or third choice? Or could it be that the history teachers of the secondary grammar school in Aszód are committed to the case of 1956? Or else, could it be, that the years that passed since the previous studies qualified 1956 as history? At this point, this question cannot be answered, for that we would need data from the same sample with only one answer, or data from a different sample for the same questions. However, should we get any of these answers, it is reassuring, that there is hope that 1956 can be taught to be a national holiday.

The tendency to find positive events more in the far past and only occasionally in the closer past was interpreted by László and his colleagues as a sign of the resigned Hungarian pessimism that tends to turn to the past. However, it can be seen, that if not only one but three answers could be mentioned by the students, 19th and 20th century events appeared in a significant proportion beyond the events making people proud. According to this finding students can see the values of a certain era even if it can otherwise be interpreted as a tragedy, and find the moral message of these events important even today.

In the discussion, László et al. (2002) raise that two things are missing from the spontaneously mentioned stories: one is the cooperation with other nations, the other is the era of peace. However, by altering the instruction, these aspects appear as well. The importance of cooperation with the Habsburgs is confirmed by the fact that 10% of the students mentioned the Austro-Hungarian compromise or the era after that as positive. The importance of the peaceful eras is also shown by the fact that altogether 10% of the students mentioned the victories of the Golden team, the era of the language renewing, or the happy barrack as a positive event (Figure 1).

Our results are worth comparing with the results of György Hunyady, who found forgiving, nostalgic retrospection to the Kádár regime, both in 1991, among students, and at the millennium, using representative samples (Hunyady, 2010). Although we have not defined periods within the socialist era, the consistent negative evaluation suggests that this kind of nostalgic attitude is missing from our sample, except for mentioning the happy barrack in a positive context for a few times.

The answer for our second question, that is, people evaluate positive events as more positive than negative events negative is comforting as far as the Hungarian identity is concerned, and it is well interpretable on the basis of the social identity and collective memory literature, although contradicts to the idea of the pessimistic and self-deteriorating Hungarian soul. People have a natural tendency to evaluate their group, and hence themselves in a positive way (Brewer, 1999; Cialdini, Borden, Thorne, Walker, Freeman & Sloan, 1976; Tajfel, 1982), what they try to achieve even when the facts try to hinder that. In such cases, things are re-evaluated along certain views, identifying aspects, that create advantages from the losses (Lemaine,1974) and rethinking the motives and the causes behind failures to find an interpretation that is more for the own group (Pettigrew, 1979), for example by emphasizing the failing group's noble motives in contrast with the alien enemy' dubious motives. Reaching a positive identity is one of the most important memory functions, according to the research tradition of collective memory (Assmann, 1999).

The third set of questions in our research was related to the underlying dimensions of the evaluations. Behind the primary dimensions of origin, positivity and belongingness, we have found secondary dimensions like consensus, fate similarity and sovereignty. On the basis of the primary and secondary dimensions it is not difficult to identify relations between aspects of evaluation and the functions of collective memory. Belongingness and consensus may refer to common experience, origin and positivity to positive identity, negativity and fate-similarity to trauma-elaboration, sovereignty and positivity to morality. Of course we are aware of the subjective nature of our interpretations that might appear in attributing meaning to the underlying dimensions found by the multidimensional scaling.

Nevertheless, our study based on the analysis of evaluations may encourage, that it worth to collect such data on larger and more heterogeneous samples. That would create an opportunity to overcome the limitation of the present study, the relatively small and homogeneous sample.

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APPENDIX

The scales for evaluation

There are credible sources of information about the event.	There are no credible sources of information about the event.
The event determined Hungary's fate for a long time.	The event was not that significant.
It brought something new some development for the Hungarians.	It hindered the development of Hungary.
It influenced the future of the Hungarians.	It did not influence the future of the Hungarians that much.
It was a positive event in the Hungarian history.	It was a negative event in the Hungarian history.
It is evaluated the same way by different generations.	It is evaluated differently by different generations.
It influenced my family's life.	It did not influence my family's life that much.
I wish I had participated in the event.	I am glad I did not participate in the event.
It contributed a lot to the Hungarian awareness.	It did not contribute a lot to the Hungarian awareness that much.
It proved that Hungarians are willing to fight for freedom.	It did not prove especially that Hungarians are willing to fight for freedom.
It was worth fighting.	It was not worth fighting.
It revived the awareness of national belongingness.	It did not revive the awareness of national belongingness that much.
I am proud it had happened.	I am ashamed it had happened.

THE ROLE OF SCHOOLS IN NATIONAL REMEMBERING I.

THE MANIFESTATION OF NATIONAL REMEMBRANCE IN THE ORGANISATIONAL CULTURE OF SCHOOLS

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ABSTRACT

This study is exploring by what means a school as an organization can strengthen national remembrance and national identity. In connection with this we demonstrate the obvious manifestations of a school's organizational culture, supposing with the supposition that school traditions (national holidays, school memorial days) and certain verbal, visual-material manifestations of the organizational culture function as 'lieux de memoire', or as models of 'lieux de memoire'. We are highlighting the organizational duality following from the functional differences of the 'lieux de memoire' of the distant and recent past: that is, the existence of the declared 'lieux de memoire' in regulating school documents and the practice of emphasizing certain segments of national remembrance while ignoring some others. The theoretical and practical concerns of the topic are connected with document analysis, web page analysis and field work in schools

Keywords: organizational culture, artifacts, socialization, traditions, national feasts, memorial days, qualitative methods

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1. INTRODUCTION

In modern societies education-training-teaching can only be interpreted as a deeply structured and differentiated subsystem, and as such it fulfils a lot of duties (Schaffauser, 2006). Without being brought up and educated in an institutionalized way we would not be able to become a cultured and productive citizen accepting democratic values. To achieve this important social aim schools have to provide certain functions from which in this article we are focusing on the so called qualificational and integrating-legitimate functions. By qualificational function we mean that schools offer social and moral norms, transmit knowledge and aptitude. In addition, they communicate a certain disposition of values, ideologies, that is, they promote the development of certain attitudes (integrating-legitimate function). All this takes place to a lesser degree openly and directly (e.g. in school documents), but most of the time it just happens indirectly, for example due to school atmosphere, teaching methods or other secondary features. The situation gets more complex because of the fact that in our world of modern values, where the spirit of the time is more and more dominated by the frame of science-technology-society, we need to reword what the cultural and organizational roles of schools are (Kovács, Perjés, Sass, 2005). Modern schools should respond to ongoing changes which tend to break traditional frames according to a double standard: they should be able to meet the growing challenges in institution and organization, and at the same time to preserve their roles in transmitting cultural values. The aim of this study is to give with qualitative methods an insight into the dynamics of the organizational transmitting mechanisms of national remembrance and national identity in schools.

2. NATIONAL IDENTITY, COLLECTIVE REMEMBERING IN DOCUMENTS REGULATING SCHOOL LIFE

In a general sense identity awareness can be interpreted as a complex and layered network of the mind, which connects the individual to a family, to different communities, to a nation and to mankind, forming in the meantime complementary ties. The identity awareness – called supra-individual (collective) identity consciousness – which develops in this way may be national, gender, racial or class (Gyáni, 2008).

The emotional and rational relationship with the national community is in fact our national identity, and schools play an important role in its formation fulfilling different social duties. This idea is supported by Csepeli (Badis, 2008), who determined national identity as a kind of affective and cognitive set of knowledge, the parts of which form a hierarchical system. The bottom layer is spontaneous identity, which is topped by attitudes, values, urges and ideologies. Pataki's approach is similar (1997, p. 177). "National identity is part of our self-system which comes from the experience and awareness of belonging to a national-ethnic group – together with all its evaluating and emotional momentums and behavioral disposition". We can also say that collective identity has its raison d'etre through interaction with others (Takács, 2007) and it is based on sharing common knowledge and memory (Assman, Gyáni, 2008).

The cognitive set of knowledge and national self-knowledge cannot come into being without collective remembrance. Theoretically a number of remembering practices can be applied to form and preserve identity in the world of school: traditions, history, literature, etc. However, in connection with teaching history at school one must be careful because of the fact that history book are not suitable to function as artificially created 'lieux de memoire' due to small range of schoolbook publishing and the ever changing contents (Király,2010). Among the working mechanisms of collective remembrance public commemorations, ritual areas, written documents, different cultural activities are the most obvious in the world of school (Péter, without data).

The National Core Curriculum is the first to be mentioned from among the written documents. It determines the fundamental principles, goals and most important tasks of public education in the Republic of Hungary. It is the basic document of school education. It describes the main fields of education, the content sections and also what development tasks there should be in certain sections. The concept of national identity first appears in the National Core Curriculum among the common educational values, and it applies to both majority and minority groups. However, when it comes to the development of identity, there is a stress on collective identity which can be interpreted in a broader sense.

> ''The National Core Curriculum (NCC) emphasizes how important it is to know both the country and its environs, the Carpathian Basin, to know the traditions of the nation, and to develop national identity in a way which at the same time fosters the identity awareness of minority groups. It gives an opportunity to gain knowledge about the lives and cultures of minorities living in our country. At the same time, when determining its development projects, NCC pays attention to humanist European values and concentrates on contents which emphasize that we are part of Europe." (p. 7)

The national Core Curriculum defines so called key competences as well which form a transferable and multi-functional unity of knowledge, skills and attitudes (Henczi, 2009). They are indispensable to develop successful personalities and to help to adapt to society. Certain highlighted development tasks (exactly 9) are based upon this. Among them, after self-image and self-knowledge, there is the knowledge of the home country and its people – and again, placed in a broader context – European identity awareness and universal culture:

> "It is essential that our students should know the typical features of our nation's cultural heritage and our historic values. They should study the work and activities of outstanding Hungarian historical personalities, scientists, inventors, artists, authors, poets and sportsmen. They should know our geography, literature, history and everyday life. They should learn and practice those individual and communal activities which lead to appreciating and identifying with our home country. They should get acquainted with the traditions and characteristic features of rural and city life."

"It is very important to promote a harmonious relationship with our natural and social environment, to establish an awareness of national identity, to deepen national self-knowledge and patriotism. Appreciating the values, the history and the traditions of other peoples living in and surrounding Hungary should be equally important. NCC encourages the young to explore and foster the historical, cultural and religious memories and traditions of their

homeland and beyond it, and to take individual and community action to meet these requirements." (p. 13)

Last but not least there can be found such descriptions in a more or less direct way among the cultural areas of NCC, too. For example the cultural area of "Man and Society" mentions three aspects: history, human studies and social studies. In connection with history it is defined as society's common memory, "which is a means of strengthening the awareness of national and European identity." (p. 54) Despite this it is only slightly revealed even if this cultural area is studied in details. Surprisingly enough, it is the cultural area of "Our Globe and Environment" (table 1) and its module "Orientation in Space and Time" with its sub-module "Geographical and Environmental Issues of the Homeland" that contains national identity and the relevant skills development (p. 90).

Table 1, National Identity Awareness in the cultural area of "Our Globe and Environment" in NCC

National Identity Awareness		
forms 5-6	forms 7-8	forms 9-12
Getting to know the natural and socio-economical values of the homeland and beyond it to develop an attachment to the home country.	Getting to know the natural, cultural, ethnographic, economic and environmental values of the Carpathian Basin and Central Europe to develop an attachment to the home country and to Europe.	Broadening knowledge about natural, cultural and economic values to deepen attachments and to strengthen national awareness based on realistic concepts.
	Learning about the role of Hungarian travelers, scientists and experts in discoveries and explorations round the Globe.	
Getting to know Hungary's international reputation. (E.g. pivotal figures, intellectual and manufactured products, so called Hungaricums.)	Getting to know with the help of different sources the situation of the Hungarian economy and its system of relations in the Carpathian Basin and in the EU.	Learning with the help of sources about the importance of the Hungarian people and Hungary, studying the role of the Hungarian economy in Europe and in the world.
	Studying and interpreting the problems of our environment and their home and regional connections on a basic level.	Studying and interpreting the values and problems of the environment, their home, regional and global connections.

These examples illustrate quite well that it is worth studying the public and other documents of school life and to observe their inner coherence from the viewpoint of our research topic:

– *Pedagogical Program*

The Pedagogical Program is a public school document which is in accord with the National Core Curriculum. It is in fact the school's pedagogical strategic plan concerning at least one

teaching cycle. It can also be considered the self-definition of a given institution. It has to contain the basic pedagogical principles, goals, tasks, means and methods. It includes the pedagogical tasks in connection with personality development (educational program), all the subjects taught in different forms, the compulsory and optional lessons/lesson numbers, and the specified teaching material and requirements (Local Curriculum).

It could be very illuminating to compare the Pedagogical Program parts of different Local Curricula from the point of view of national identity: goals, applied measures and effectiveness. In connection with effectiveness Mikolasek (2004) made a survey based on a questionnaire with primary school children (separated into junior and senior categories) to explore their sense of Hungarian identity and their knowledge on Europe. Some thought-provoking facts from the survey: 31% of the 2277 pupils surveyed could not name a single country neighboring Hungary, 4/5 of them could not list five Hungarian cities. Not even one child could name all the four national symbols (crown jewels, banner, arms of the nation, national anthem), although they are part of the 4th form teaching material. However, many of them considered Szeged fish soup and Kecskemét apricot brandy national symbols. From the most important historic dates the following were the most determining: 1848, 1000, 896. Other surveys conducted at home focused on the criteria of national affiliation (Szilassy, 2006), that is, they tried to trace the changes in the concept of 'nation'. During interviews with groups of teenagers they found that there were major uncertainties in classification: even deciding who should be considered Hungarian was not easy for them.

– *Organizational Statutes*
It contains the functions of the institute, its external and internal relationships through certain issues (like workers' protection law, training regulations, parents' organizations, range of duties), and here can be found the school's traditions and how they should be fostered and also the different school celebrations (Ollé, 2006).

– *Rules of the House*
It means the practical description of the school's life. It regulates the work of the school, the expected student behavior, students' rights and obligations, the order of disciplinary procedures, the procedure of allocating subsidies, etc.

3. THE ORGANIZATIONAL CULTURE OF A SCHOOL

"By organizational culture we mean the coherent system of values, attitudes, customs, beliefs and ideas, which has directly and indirectly perceivable elements" (Kovacs, Perjés, Sass, 2005, p. 52). This concept is very well reflected in the literature written about organizations through the 'iceberg' simile. According to this, organizational culture has obvious, visible components, and also directly not manifested hidden components which remain under the surface. Organizational culture in all instances is unique and not repeatable, just like personality. It is this uniqueness that mostly contributes to the identifying process of all the members. Very typical expressions are 'in our school', 'we usually', and they all show the existence of the

above mentioned identification. A school's organizational culture conveys norms, sets examples, and makes it clear for the members what values count – which are part of the conceptual basis – thus it influences members and work in an indirect way, just like institutional philosophy and ideology. It can also be declared that school organizations convey a way of thinking, a philosophy and values that are significant educational powers in an intellectual, practical and social sense (Beare, Caldwell, Millikan, 1998).

3.1. The importance and functions of Organizational Culture

According to Posser (2007) organizational culture is important in connection with schools for three reasons. The first viewpoint is that organizational culture shows how the organization functions when no one observes. Thus it can be interpreted as a phenomenon of everyday life. The second viewpoint is that it can make an impact on the successfulness of the organizational functions. Consequently, the ethos or the moral world view of the school and the effectiveness of the school are closely related. The third viewpoint is of methodological nature because this conceptual construction provides a perfect frame for the studying and understanding of school life.

According to J. Ott considering its functions organizational culture (Van Houtte, 2005)
–   provides the members of the organization with common interpretations which help them find out what kind of thinking and behavior are expected from them
–   guarantees a common pattern of values and norms, so the members will know what to consider valuable
–   sets borders, so both insiders and outsiders can be identified
–   has a controlling function, too, that is, it tells what to do and not to do.

However, the question arises: how can the organization influence its members, how does it do the above mentioned job? The answer is that the impact made on the individual prevails via the socializing process. The individual gets into the habit of certain things, accepts values and norms in order to be able to work in the given group. In addition, the group also tries to put pressure on the individual to reinforce the existing norms. This is done in a way that a non-conform member is threatened with refusal or exclusion. If the individual finds it important to be accepted and valued, the process of identification with the goals and values of the organization gets started.

3.2. The Visible Components of Organizational Culture as "Lieux de Memoire"

By definition any material or non-material entity which has relevant symbolic contents from the point of view of cultural self-identity can be a lieu de memoire (Kovács,2010). Such are certain geographical places, historic figures and even written documents, symbols and national holidays. On the basis of this we can state that certain manifestations of organizational culture may be interpreted in the above context.

The visible components of organizational culture according to Beare, Caldwell, Millikan's (1998) model can be put into three main categories (Figure 1):
1.   Conceptual/verbal manifestations: here are the organizational goals, the teaching material in its broader sense beyond the officially offered subjects, the characteristic features of communication in the community, similes and metaphors which all categorize an aspect of the

school's organization. Here are also the school stories and mythologies, which – as the essence of school culture – convey value motivated morals, and they often make a direct effect on learning.

2. Psychic/behavioral manifestations: here are the different school rituals, ceremonies, rules, parents and the environment (consultations, open days, teacher-parent meetings, etc.). The teaching/learning process is also in this category; and also the different operational or conflict resolving institutional features, that is, the elements of functioning.

3. Visual/material manifestations: here are the school's equipment and available resources, its memories and objects recalling notable school events, the school's symbols, mottos and types of clothing. Visual/material manifestations – or artifacts – are organic parts of the socio-cultural conveying process of the school. Values, beliefs and norms – besides language and behavior – can be conveyed through objects (Johnson, 1980). The physical environment consequently can be the agent of socialization, so it can be interpreted as a socio-cultural message. On entering a school one can immediately experience the level of artifacts, and our first impressions are based on them Stolph & Smith, 1995).
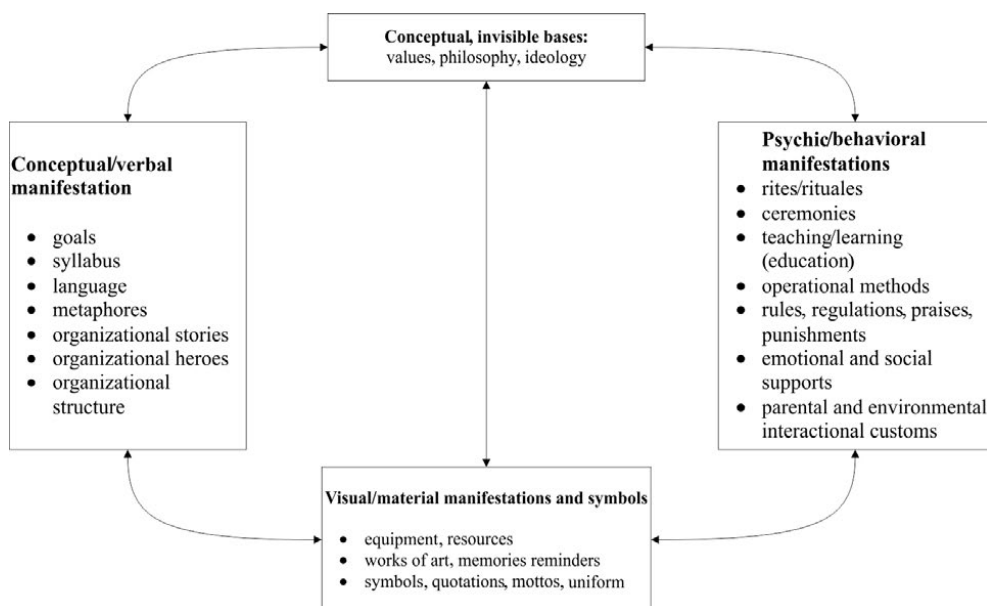

Figure 1. The Layers of Organizational Culture

However, we should know that organizational culture is an active formation, that is, there is constant fluctuation between the visible and hidden levels. As time passes the obvious and conscious elements of the present may get into the more hidden and less conscious level.

3.3. The observation of the elements of organizational culture relevant to the research

3.3.1. Conceptual/verbal manifestations

Purposes and goals: in the summary table purposes and goals are of high priority. Purposes demonstrate the attempts of the institution on a general level. Their role and their importance are that they promote focusing and making efforts. Goals turn purposes into an action plan, that is, they are placed on a more exact level. These goals can be short term (a maximum of one year), average term (2-4 years) or long term (more than 4 years). School educational programs are considered to be verbal manifestations containing average term and long term goals.

3.3.2. Visual/material manifestations

Equipment, resources: the material resources, the arrangement of the building, the furniture, the premises all reflect the priority of the school's curriculum, the accepted values and the philosophy of the school. The material culture of the classes shows the level of the symbolic integration of the local school community and society and national culture (Johnson, 1980). They demonstrate the dominance of the values of natural sciences (laboratories and their equipment), or of creativity (workshop, studios), or of religion (chapel). And they also give information on the importance of traditions and national culture through the local places of collective memory (school museum, memory corner, memorial park, memorial hall etc.).

Artifacts and memories of notable events: mementos, awards, diplomas, boards of honor and flags are all important sources of remembering.

Objects and memories recalling notable events: mementos, awards, diplomas, tables of honor and flags are important sources of remembering. Each is a part of school tradition, and they provide data about highly appreciated values in a direct way. As Cohen (1971) points out flags, pictures of heroes and leaders seen by students day after day all have one purpose: to convey a uniform set of ideas to the future members of society. National ideas and mythologies, basic value orientations can be observed on both hidden and direct classroom decorations. Pictures, topics of symbols and the way of how they are arranged reinforce as a hidden curriculum socio-cultural traditions and attitudes. Extracurricular institutional areas are also important in conveying the hidden curriculum, although in reality they are seldom in the centre of attention (Prosser, 2007). These areas are continuously formed by the everyday behavior of students and teachers, and they react on the organization members, as they are deeply embedded in the teaching-learning process due to their nature.

Emblems and mottos: emblems are in fact the visual summary of school values, and mottos are the same in the form of aphorisms. For example, they can express conservatism (e. g. the use of Christian symbols or medieval symbols, such as a sward). Younger schools according to the expectations of modern times rather choose logos. Just like school rules and ceremonies the school's motto also belongs to the hidden curriculum (Wren, 1999).

School uniform: it raises the awareness of identity and strengthens the feeling of being part of a community. At the same time it can also serve as a dress code. In the Hungarian education system it has a role mainly in ceremonies.

3.3.3. Behavioral manifestations

Celebrations, ceremonies: tribute and community occasions for special events are here. They might be occasions recalling successes of the past, but they can also be sources to solve the problems and tasks of the present or the future. They strengthen common values, and markedly show what is important (DuFour, 1988). Besides functioning as a living example of the school's declared values, celebrations reinforce the idea that the individual acts in harmony with the values. National ceremonies are a path to history and a factor of historical identity awareness. By evoking the original events and by having a link to the present, national ceremonies form the students' sense of history. As celebrations are historical remembering, with their help we can establish our own relationship with the given historic event (Szabó, 2006).

3.4. Research Methods of Organizational Culture

There is a wide variety of methodology in both examining and interpreting the levels of organizational culture. There are quantitative and qualitative methods alike and their application is very flexible according to the purpose of the research. In certain instances a combination of quantitative and qualitative methods seems to be adequate.

– *Quantitative methods*

Quantitative methods mean the use of questionnaires. There is the possibility for numerical comparisons, to compare the measures of changes. And if applied to a large sample there may be an overall picture of the characteristic features of the organization (Serfőző, 2004). If behavioral norms, rules or customs are asked, or situation reports are presented, the revealed information becomes measurable, numerically comparable. However, there are two valid critical remarks on this method. First, not all organizational phenomena can be explored in this way. Second, information may get distorted in the process.

– *Qualitative methods*

The application of exploratory and descriptive methods can be very useful in studying organizational culture from several points of view. A remarkable part of researchers think that only indirectly observed information (free of any influence) is genuine, so on the level of artifacts observation and document analysis are strongly recommended. As the active participation of the organization is not needed during their application, the researcher can get information without inducing any change in the organization. We can mention a relevant research from international literature. Johnson (1980) analyzed the classrooms of different forms in a primary school on the basis of national and local socio-cultural attitudes. He made longitudinal observations and in the meantime he put the gathered information into standardized categories. Finally he gave a summarizing qualitative analysis of the material culture of the classrooms. From the point of view of this study it is an interesting observation that in junior classes he met basically decorations made by pupils: that is, pupils took an active part in making national symbols and pictures. In senior classes, however, he could identify some more subtle methods of cognitive conditioning. In these classes uniform mass-produced wall decorations recalled different national events, national heroes and showed the relationships between the nation

and the other parts of the world. While observing the visual culture of the school Prosser (2007) took pictures of teachers and students' spaces, and he also used the technique of making a map. Thus the main purpose of qualitative researches is to describe what is going on in a given place at a given time, and then to make generalizations in an inductive way on the basis of the data. As this study has similar purposes, that is, it is trying to capture how national, collective remembering is kept alive, what kind of patterns of fostering traditions are offered by schools, we have also chosen qualitative methods.

Last but not least, fieldwork has a further advantage: with its help social phenomena (like national remembering) can be observed in their natural settings. Furthermore," we can notice such subtle details and other phenomena as well that could otherwise remain unseen, and we would not be able to measure." (Babbie, 1998, pp. 307-308)

4. THE PRESENTATION OF THE RESEARCH

4.1 The Sample of the Research

The sample was six secondary schools in Debrecen maintained by the local government: two grammar schools, two secondary vocational schools and two vocational schools. We selected secondary schools because people aged between 13-25 are the most responsive to remembering in our culture (Pék, 2010), this is the time when "future memories" firmly become rooted.

In order to maintain ideological neutrality we left out congregational and church schools, and also foundation and art schools as well as specialized schools, because we wanted to focus on the traditional segment of the Hungarian public education. In the unit of 'research results' 'A' will stand for vocational schools, 'B' for secondary vocational schools and 'C' for grammar schools. It is important because the National Core Curriculum sets the same theoretical range on the macro regulation level (Pedagogical Program, Organizational Statutes, Rules of the House), but it allows more freedom on the middle regulation level so that schools can have their training priorities and local features. Even on the basis of international experience it can be stated that the different institutions of public education serve different subcultures and/or populations so they are integrated into the culture and society in a different degree (Wax, 1971).

4.2 The Procedure

I) Comparing School Documents
We studied the following compulsory public documents:
– Educational Program: basic principles, goals, values, development tasks
– Organizational Statutes: traditions, ceremonies, outer relationships
– Rules of the House: dressing code for ceremonies

II) Comparing school web pages
Web pages are more and more important on-line documents which can be interpreted as a modern means of communication for schools to have connections with the outside world.

Their task is to give wide-ranging information, to make the school attractive, and also to function as a way of community forming Mészáros – Szatmári, 2006). So they are of high significance. Both parents and students often get their first impressions from the web page of the school. A good web page informs, directs and gives a picture of the school's working methods and spirit. There are significant differences as far as form and contents are concerned, and also in whom the web page is addressed to. That is, it is very different what a given institute would like to communicate about itself, who the message is addressed to, and how all this is done. The selected colors, the visual/audio elements (pictures, inserts, music), the arrangement of the contents, the logical structure, the quality and quantity of the communication are all information about the organization, which can be compared to the other artifacts and written documents of the organizational culture. We revealed a small segment suitable for our topic:

–   Logo/emblem: do any symbols of the Hungarian nation/national remembrance appear?
–   Are the public documents available?
–   Event Calendar: what kind of ceremonies and commemorations are declared by the school?
–   Traditions: what kind of traditions appear on the webpage?
–   School history: how long is it and what is it about?
–   The person after whom the school got its name: what is communicated about him/her (picture, life, works)?

III) Fieldwork with a diary

This was the phase of visiting and observing the schools. We met the school principals and explained the purpose of our visit. We asked for permission to see the school and to collect data. The points for observation, the needed information were the same in each school. If we got permission, we also collected picture documents with the name of the school attached to them. The diary contained the following points:

–   Objects, memories, pictures along the corridors (who, from what age)
–   Board of honors – who the school is proud of (who, from what field)
–   Classroom decoration
    • pictures – what they show (people, events, symbols)
    • captions/mottos (what, by whom)
–   Logo, emblem, coat of arms
–   Dressing, uniform, badge (what they wear, when)
–   Objects in the yard, 'lieux de memoire' (statues, etc.): topic, era

5. PRESENTING THE RESULTS

5.1 Comparing the School Documents

Educational Program

The first point for observation was how often and what kind of concepts in connection with national identity and national remembrance appear in the documents (*table 2*). As the table shows there are major differences. The numbers of occurrences vary between 3 and 20.

After having a look at the documents we can see that the concept of 'national culture' is the only one which appears in all Educational Programs. We saw the context in which it was mentioned in the different documents (*figure 2*).

A1 among its pedagogical principles the past and present of national culture are emphasized because a demand on familiarity with history and national self-knowledge might be an important element of patriotism.

A2 very shortly it declares that conveying the basic values of national culture is considered to be its major duty.

B1 it expresses its attempt to reinforce the elements of the knowledge of the homeland and people in relation to national and universal human culture according to the requirements of NCC.

B2 the issues of the knowledge of the homeland and people among the highlighted development areas are discussed in details. The concept of 'national culture' appears in connection with this. It is indispensable to know its values. Being familiar with the life and work of prominent Hungarian figures (scientists, inventors, artists, writers, poets and sportsmen) is also part of this field. In addition, the knowledge of the geography, history and everyday life of the homeland is part of getting to know the national culture. At the same besides knowledge they also emphasize individual and community activities that support identification process. The role of fostering traditions is highlighted here. It is an important viewpoint that forming and deepening the sense of national identity, national self-knowledge and patriotism happen along with appreciating other people's cultures.

C1 The most important task is to honor the cultural heritage of our environment and beyond it, and to foster national traditions. Here, too, it is a requirement to be familiar with the most prominent Hungarian historic personalities, scientists, artists and their work; and also to know Hungary's geography, history, literature and everyday life.

C2 it gives practically the same description of how to familiarize students with national culture. What differs from the previous ones is the fact that it mentions patriotism as well among the highlighted values (knowledge, humanity, creativity, health, aesthetics, and democracy) conveyed by the school. There is a separate passage in the document devoted to pedagogical aims in connection with patriotism: for example the knowledge of typical natural and cultural values of a geographical region, or the clarification of our relationship to the homeland (with project work like 'Why is it good to be Hungarian,' or the interpretation of relationships like home country – nation, home country – family, or the knowledge of the history of the neighborhood. It should be pointed out that besides the usual special areas like Hungarian Literature, History and Geography the topic is dealt with in Ethics and Home Room lessons, too. They pay a special attention to ceremonies and commemorations (fostering traditions), to community programs, which can deepen patriotism through personal experience. There are excursions planned to major home regions, or to Transylvania to the place where the famous personality after whom the school was named was born (the school principal said).

Table 2. concepts with the frequency of their appearance in the educational programs of the three types of school

A1	B1	C1
patriotism (2) Hungarian identity traditions (2) national self-knowledge national culture knowledge of the homeland and people history of the school and city historical commemorations	national value (2) national culture knowledge of the homeland and people	national values (national) traditions (6) national holidays national identity awareness of identity patriotism (2) knowledge of the homeland and people our history national cultural heritage national culture (3) native country (5) nation (2) sense of national identity Hungarians national self-knowledge Hungarian identity
A2	B2	C2
national holiday (national) tradition (2) national culture (2) national education patriotism the past of the country history	(national) traditions (8) native country national and cultural identity national culture (3) knowledge of the homeland and people sense of national identity national self-knowledge patriotism cultural memories national past	national culture (national) tradition (4) patriotism (2) community remembrance national identity our history (2) our historic events

Organizational Statutes

In educational programs the most frequent expression in connection with the topic is '(national) tradition' (figure 3). It seems that it is of high importance for schools in conveying national culture. This result makes it even more justified to have a look at the data in this field.

Of the six schools five were named after a famous person (table 3), three of these names are also linked to our city (local memory). All these schools pay attention to establishing and fostering traditions based on their names: a wreath-laying at the lieu de memoire (statue or memorial hall) is very typical. In these cases we mean rituals like the opening ceremony of the academic year, the school leaving ceremony, the famous person's birthday. Other typical events are the school-week or school days, during which students have competitions, contests and various programs. Their aim is partly to remember, partly to reinforce the feeling of belonging to the school organization, to become conscious of 'us'. One (C1) school (both students and teachers) even has the tradition of visiting the birthplace of the name giving person in Transylvania at least once a year.

Figure 2. Expressions associated with the concept of national culture by schools
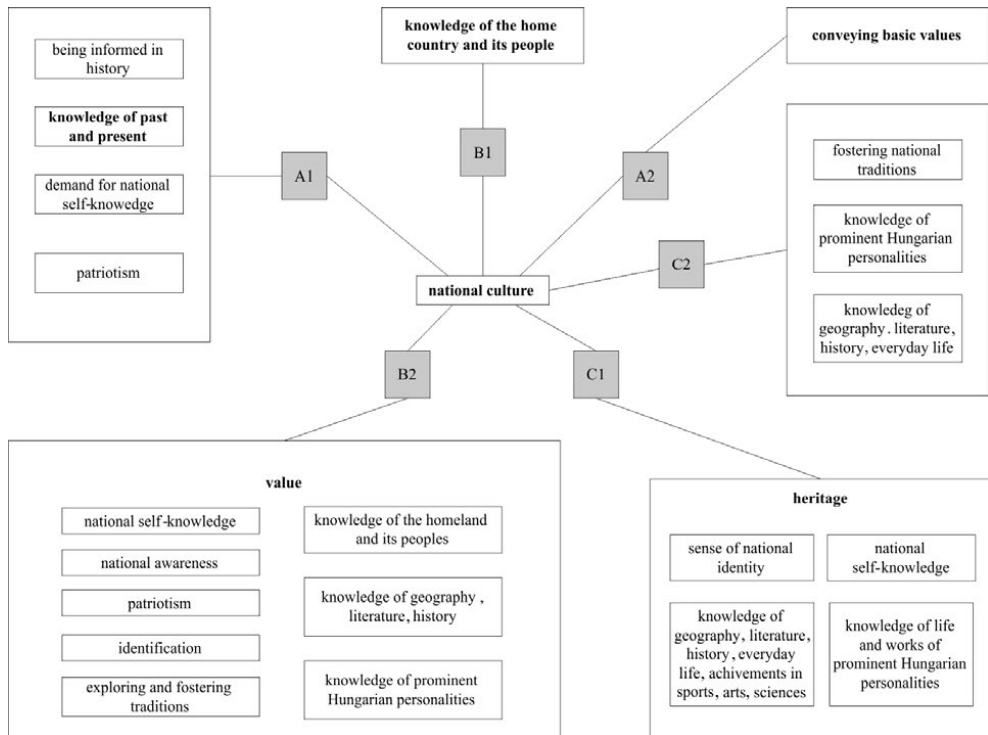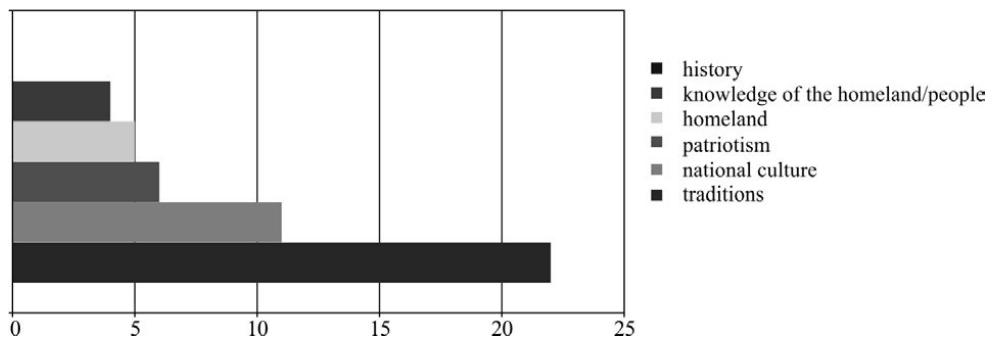

Figure 3. The most common expressions of educational programs

The most common element (in appearance beyond dressing) of fostering traditions is the school badge. In two cases there is also a school flag. In the case of the vocational schools the decoration symbolizes the vocation trained in the school (visual representation). In the case of one (C1) grammar school there is a sailing boat on the flag with the motto of the school: "the hero of the future is on board." It is a combined case of visual and verbal representation.

As far as historical ceremonies are concerned there are no big differences: we have two national holidays that have to be commemorated appropriately on a school level (March 15th

and October 23rd). It is done accordingly. In connection with the contents of these ceremonies we should mention some typical Hungarian features. As Szabó (2006) points out in his study, so far in Hungary we have not had any crystallized social traditions for ceremonies (not only in schools). The reason for this is that earlier national holidays (e.g. April 4th – the "liberation" of Hungary after the 2nd World War, or March 21st – the proclamation of the Hungarian Soviet Republic) simply disappeared with the change of regime, while others (e.g. August 20th – Foundation of the State) still exist though with a different message. October 23rd is a relatively new national holiday. Another complication with this holiday is that the happenings of the day have been drastically reinterpreted since the change of regime. We may even say that its image is now just the opposite of what it used to be. In addition, it is often in the crossfire of current political disputes. As a consequence public thinking does not get any starting points in connection with ceremonies (Szabó, 2006).

It is important to note that since 2000 it has been compulsory to have three memorial days in secondary schools: Holocaust, Victims of the communist regime and the Martyrs of Arad. Earlier there were no such traditions in our education system. They are not school holidays. On memorial days there may be thematic lessons, competitions, visits to memorials, or even poster making. The number of such memorial days is not finalized, this school year another memorial day has been added: National Togetherness Day. In October 2010 the Parliament passed a resolution according to which there should be a special day to express the strengthening of the relationship between the young living in Hungary and those living beyond its borders (101/2010). Therefore since the academic year of 2010/2011 on June 4th, which is the date of the Trianon Conclusion of Peace, every public school has had to organize a memorial day with the name of National Togetherness Day. (Taní-tani, online alternative magazine, 10/26/2010)**. This new memorial day is so new that we did not find it in the observed documents.**

Regulations Concerning School Ceremonies in the Rules of the House
Regulations concerning school ceremonies (table 4) are not uniform about what to expect from students. In half of the observed schools there was nothing mentioned about behavior. Those that include something in their documents emphasize mainly discipline and respect. The observed schools do not have a school uniform, generally students are expected to wear a white blouse/shirt and a dark skirt/trousers.

5.2 Comparing school web sites
As far as their appearance is concerned school web site are various. Still, they have common content elements (table 5). One school (A2) is totally different because its web site contains only minimal information, and most of its links are blank. Apart from this one school the others try to show as much as possible about themselves and to highlight their strengths and achievements.

The documents about school regulations can be found on all web pages. This by all means a positive feature because it means publicity for the goals and values declared by the school. Both parents and students can be informed and make comparisons.

Table 3. Fostering traditions, ceremonies in Organizational Statutes

School	Traditions in connection with the name giving person	Historical ceremonies	Commemorations	Formalities of fostering traditions
A1	School days, Maintenance of school 'lieux de memoire', demonstration of his/her works, Jubilee programs, Collection of school history memories, Corridor exhibitions	March 15th October 23rd	Holocaust Martyrs of Arad Victims of the communist regime Day of Hungarian Drama Day of Poetry Day of Hungarian Culture	School banner, with the emblem of vocations trained in the school, School badge
A2		March 15th October 23rd		School badge
B1	School-week	March 15th October 23rd	Holocaust Victims of the communist regime	
B2	Wreath-laying at the statue of the name giving person at the opening ceremony of the academic year	March 15th October 23rd		
C1	Annual celebration on the birthday of the name giving person: biographical, poem testing, quotation seeking, poem illustration competitions, poem reciting competitions Wreath-laying: statue and grave Visit to the birthplace (compulsory!) Visit to museums	March 15th October 23rd	Martyrs of Arad Victims of the communist regime Holocaust	School banner (with the motto) School badge School tie and scarf
C2	School-week: competitions, sports programs, wreath-laying at the statue of the name giving person	March 15th October 23rd	Martyrs of Arad Day of Hungarian Culture Victims of the communist regime Day of Poetry Holocaust	School badge

Table 4. Regulations of School Ceremonies in the Rule of the House

	Dress code	Behavior requirements
A1	For school events: suit, skirt, blouse	
A2		Disciplined behavior, observing the rules
B1	Clothing: white blouse/shirt, dark skirt/trousers, scarf/tie with school emblem	Respect for national flag, national anthem
B2	Uniform, not wearing it is disciplinary offence	
C1	During prominent school events white blouse/shirt, dark skirt/trousers (not jeans), school scarf/tie	Standing at attention for national anthem
C2	During major school events white blouse/shirt, dark skirt/trousers	

Table 5. Content elements of web pages

Web page contents	A1	A2	B1	B2	C1	C2
Logo/emblem			X			X
National/historical symbols			X	X		
Public documents:						
Pedagogical Program	X	X	X	X	X	X
Organizational Statutes	X	X	X	X	X	X
Rules of the House	X	X	X	X	X	X
Event calendar/schedule ceremony/commemoration			Martyrs of Arad October 23rd Victims of the communist regime March 15th Holocaust	October 23rd March 15th	Ceremonies and commemorations not listed in an event calendar	Martyrs of Arad October 23rd Victims of the communist regime March 15th Day of Poetry Trianon Memory Day
National traditions: School traditions					X	
School history:						
Pictures, illustrations	X		X	X	X	X
Description	X		X	X	X	X
List of events						
Name giving person:	X		X	X	X	X
Life	X		X		X	
Works	X		X		X	
Picture/photo			X	X	X	

We found two schools with emblems or symbols that can be connected to the local or general aspects of national remembrance. On one school's (B1) web page we saw a combined

figure which refers partly to the school's profile (chemistry), partly to Hungary (ribbon with the national colors) and partly to the global world (the Globe). On B2's web page the coat of arms of the home city can be seen.

Emblem of School B1   School B2: Coat of arms of Debrecen

In the case of one school (C2) there is a logo in which the initials of the name giving person and the initial of the home city appear forming a unity. This symbol refers to the connection of the city and the school and also to the name giving person's origin (local remembrance).

On the web pages of secondary vocational schools the event calendar and the schedule are to be found. On B1's web page they can be read in a colorful, easy interactive format. On the web page of the other school (B2) they are among the other documents and they are mainly for the teaching staff. C1 has a document with the title 'Order of the School Year', but only the school vacations and the final exams appear in it. C2 is the only school which mentions the newest memorial day, Trianon.

No direct information about national traditions can be found on the web pages. Only in the case of one school (C1) are school traditions available from a link in thematic way. With the exception of A2 there is some sporadic information in this topic. It is typically in connection with school balls, school days, the school-leaving ceremony, that is, the most important communal events for the school to remember.

The description of the school's history appears in all cases except for A2. Time perspective is very important to show what kind of antecedents have led to the present state of the school.

The name giving person is Hungarian in all cases, a scientist, a poet or a historic figure whose life and work even today is of high value for the culture of Hungary. In the case of vocational schools and secondary vocational schools the school profile is also in connection with the choice of the name.

5.3 Experience of Fieldwork

After the observation of the schools (table 6) there are two major kinds of experience:

1.   Vocational schools convey national remembrance in a more direct way: a number of objects, pictures on the corridors and in other communal places. The presence of visual culture and artifacts can be felt. The text of the national anthem on the wall is also a means of powerful conditioning. As in these schools the vocational training is strongly visual and manual (light industrial and building), it is quite adequate to have this kind of organizational communication pattern.
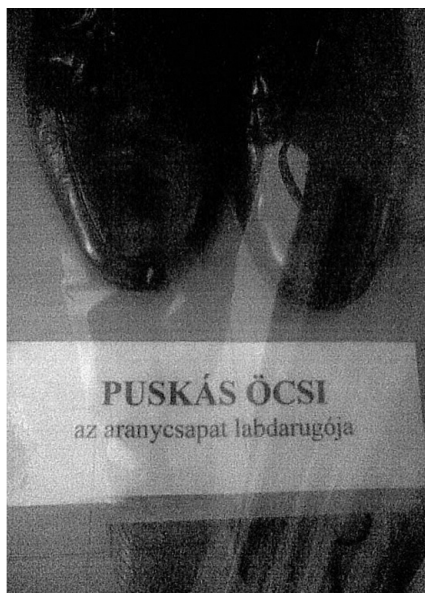
As compared to the above mentioned, in grammar schools the elements of national memory are conveyed in the form of projects (the end of the House of Árpád; why is it good to be Hungarian?), competitions (homeland history, city history), and homeroom lessons. Secondary vocational schools are between the two other types in this respect: there are

examples of both visual/material and conceptual/verbal solutions like '1956 seen by a teacher and by a student' project, city history competition, pictures in the library and in some classrooms.

2.   Certain segments of national remembrance are emphasized.

a)   During the school visits it turned out that from the themes of declared national holidays and compulsory memorial days only the Revolution and War of Independence of 1848-49 is presented in the form of pictures, memorial corners and memoranda. **We did not find any pictures or references about the Revolution of 1956, although it is a national holiday, and nor did we find anything about the Holocaust, or the victims of the communist regime, or about Trianon.** This collective disregard should serve as a warning. Szabó Ildikó's online study (2008), 'Divided Society, Divided Celebration', offers an explanation for this phenomenon also from a socio-psychological point of view. Excerpt:

"The Hungarian society has not come to terms with certain basic national issues after all the trauma that hit the national identity. None of the political systems could give a satisfactory answer to these questions. Thus there was no opportunity to come to terms with the determining events of the 20th century (e. g. involvement in the 1st World War, the background of the Trianon decision, the foreign and home affairs – concerning national issues – of the Horthy era, Hungary's involvement in the 2nd World War, the Hungarian Holocaust, the Revolution of 1956 and the Kádár era following it)."

"On the level of public thinking these indigested events are accompanied by other barely digested collective experiences (war events, deportation, labor camps, death-camps, first German and then Soviet occupation, forced labor, resettlement, internal exile, kulak persecution, escape, swapping of the population) and just slightly clarified responsibilities. National identity was weakened by losses, emigrational waves, collective offences and frustration. As far as the judgement of participation and collective experiences is concerned the Hungarians have not yet formed their historical evidence, which could serve as a reliable starting point for a common sense of history, and which could be the basis of the general thinking about the nation."

The above mentioned is supported by Kovács's study (2010), which compares the functions of recent past and distant past 'lieux de memoire'. He points out that there is a certain shift of emphasis as far as their functions are concerned. 'Lieux de memoire' of the distant past mainly have a cultural-national identity providing role. They play this role because they are characterized by systematization and purification. They have become independent of all layers and no desire for moral self-justification is attached to them. In contrast to this, in connection with 'lieux de memoire' of the recent past certain moral self-examination and experience sinking aspects dominate, occasionally accompanied by trauma treatment.

b)   The pictures that can be seen in the schools show Debrecen's past (Debrecen as the guard city of independence, its role in the events of 1848-49), and its emblematic buildings (the Big Church, the Reformed College, the old City Hall, the Small Church, etc.). In the secondary vocational schools and grammar schools we could see references to famous literary figures

whose names can be related to Debrecen (Árpád Tóth, Endre Ady, Mihály Fazekas, Mihaly Csokonai Vitéz, Gábor Oláh, Sándor Petőfi, Gyula Krúdy), also to prominent scientists (Lóránd Eötvös, Jenő Wigner, Dénes Gábor, György Hevesy). But this is not by chance, this is according to training preferences.

In connection with the visit to the schools we can also state:

1. Their own history (local remembrance) is very important for all the schools. It is grammar schools that emphasize this the most: one of the two even has its own school museum, the other has 400 pages of remembering in its jubilee book to which both teachers and pupils contribute.

2. All the schools have a board of honor: that is, the schools keep a record of the students who had an exemplary and outstanding achievement either in academic or in vocational fields.

Table 6. The data of the visits to the schools (next page)

SUMMARY

The school is a highly important socialization field of conveying and forming national remembrance. In our study we wanted to get an answer to how it is done and which segments of the school's organizational culture are affected in this process. After observing the different layers we came to the conclusion that besides the conceptual/verbal manifestations the behavior and visual/material manifestations can also bear – and they do carry to a different extent – national remembrance. According to the training profile of the schools different manifestations dominate in the communal and student spaces. In the case of vocational schools there is a more direct influence which is mainly visual/material. In the case of grammar schools this influence is rather conceptual. As far as national holidays and memorial days are concerned the schools reflect the same ambivalence and uncertainty that existed in our society during the 20th century.

	A1	A2	B1	C1	C2
Corridors: photos and paintings, objects	Buildings designed by the name giving person: *Nine-arch Bridge (Hortobágy)* *City Hall (Debrecen)* *Nagyerdei Vigadó (Debrecen)* Hungarian Crown Jewels Posters about the history of Debrecen made by students Pictures about the War of Independence of 1848-49: '*Debrecen the guard city of independence*' *Military cemetery* *Memorial of Nagy Sándor*	Famous sights of Hungary: *Buzsák, Kalocsa, Hollókő, Szentendre, Tihany, Mátraszentiván, Eger, Kecskemét, Hortobágy, Hollóháza, Pannonhalma, Tihany, Keszthely* Busó carnival festivities national costume of Kalocsa Fishermen's Bastion Parliament Building Arboretum of Szarvas Aggtelek Old Debrecen Opposite the entrance: flag of Debrecen and the Crown of Hungary	Famous sights of Debrecen - student poster: *Big Church, Small Church, Reformed College, County Hall, inner city (Franz Joseph Street)* Map of Debrecen In the school library literary portraits: *Imre Madách, Mihály Csokonai Vitéz, Mór Jókai, János Arany, Sándor Petőfi, György Bessenyei, János Batsányi, Bálint Balassa, Ferenc Kölcsey, Ferenc Kazinczy, Mihály Kisfaludy, Gyula Krúdy, István Örkény, László Nagy* Scientists: *Dénes Gábor, György Hevesy*	Corridor exhibition of the name giving person: *pictures, poems* Students' photographs and diplomas of their successes In the assembly hall: *the flag of Debrecen, Lóránd Eötvös poster (from a competition)*	Gábor Oláh, Gál Huszár, János Gáborjáni Szabó, Mihály Fazekas, György Bessenyei, István Bocskai Bertalan Székely: *The women of Eger* (painting) György Dózsa Jenő Polya – surgeon Ödön Krampecz – pathologist János Bok Attila József Sándor Petőfi
Board of honor – students that the school is proud of	Student lounge on 1st floor: - winners of national vocational competitions (decorators), - winners of sports competitions - excellent student of the vocation (joinery)	Winners of vocational and sports competitions Results of fashion shows and dress designing	Right opposite the entrance: OKTV – national academic competition in Physics, Chemistry, Biology Winners of sports competitions Place winners of the 'Mother Tongue' competition	On the corridors: photos of students who have become famous – *actors/actresses, media personalities* Diplomas of the school's girl choir Drama festival – winner places Diplomas of the bilingual education	Winners of academic and sports competitions

	A1	A2	B1	C1	C2
Memorial corner/room School museum Collection	Pictures of the name giving person's life and work; Original archival materials, blueprints; Old contracts	Shoe museum with famous people's shoes: *Puskás Öcsi, John Paul II, Klári Tolnay, Rita Kóbán, Tamás Sándor*; Doll collection: display of national costumes	Memorial corner of the war of Independence of 1848–49: *1st Responsible Hungarian Government, 12 points, war reports, photos*; Display cabinets in front of the library – old literature magazines: *Szép Szó, Nyugat, Erdélyi Helikon*; Library: display board of the name giving person; Corridors: display cabinets: old instruments	Assembly hall: bust of the name giving person; Jubilee almanac (instead of a school museum)	School museum: *almanacs, photos, school flags, old uniforms*; First floor: relief of the name giving person; Temporary exhibition about Árpád Tóth (poet from Debrecen), his life and works
Classrooms Pictures	Members of the 1st Responsible Hungarian Government; Lajos Kossuth; Map of Greater-Hungary; Hungary's summary historical map (poster)	Hungarian stitch patterns; National costumes, Old photos of Debrecen; Flower festival; National color ribbons; Tulip motifs; Batik work cloths; Maps of Hungary; dress designs with Hungarian motifs made by students	Remembering king Stephen I – poster; Hungary's summary historical map – poster; Scientists: *György Békésy, Jenő Wigner*; Portrait of Ady and Kölcsey; Photos of the old Debrecen	Classrooms are decorated by the students themselves, their taste is reflected in them.	Classroom posters and family trees related to the end of the Árpád House
Inscriptions	Text of the national anthem			The school's motto in the assembly hall: "Sail, my boat, the hero of the future is on board." Library: "He who opens a book opens himself."	
Logos/emblems/coats of arms	Coat of arms above the blackboard, logo on boards	Coat of arms above the blackboard	Half of the classrooms have a coat of arms	Coat of arms above the blackboard; The different class orientations – different logos	Coat of arms above the blackboard

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MEMORABLE HUNGARIAN ADVERTISEMENTS

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ABSTRACT

Hungarian advertising shows distinctive characteristics, especially regarding its history of evolution and the applied methods responsible for its effects. Two studies are carried out, in order to reveal distinctive features of memorable Hungarian advertisements. According to the results, advertisements which are shocking, emotional or youthful seem memorable. Furthermore, the results suggest that Hungarians tend to assess an advertisement as Hungarian not only if clues refer to Hungary, but also if the advertisement portrays everyday situations, or settings. Unfortunately, the studies did not provide information on the memorability of different creativity templates, although it also had been aimed.

Keywords: Hungarian advertisement, memory, creativity templates

1. INTRODUCTION

In Hungary, consumer society was formed with a long delay in comparison with western countries (e.g., Sas, 2006). At the same time, in response to western influence, individualist values were internalized early in Hungary compared to other post-communist countries, because more resources were available (Manrai, Lascu, Manrai, Babb, 2001). Till today, the Hungarian market shows distinctive features, even if globalization had a strong effect. Hungarians tend to place high values on the traditional roles and activities, unlike most

western-European countries. At the same time, modern lifestyle and individualism are also more stressed in Hungary, probably a bit more than in other eastern-European countries. The study of positively assessed, memorable advertisements is predicted to identify distinctive features of Hungarian memorable advertisements.

Creativity is a key aspect of advertising, often used as an indicator of effectiveness (see e.g., Till, Baack, 2005), as it can raze attention resulting in a higher recall, can block advert-evasion and establish a positive attitude toward the message. In the psychological literature of creativity, the idea of underlying schemes emerged (Hofstadler, 1984 in Goldenberg & Mazursky, 2008; Kauffman, 1995; Simon, 1966). These schemes identify common structural features of creative products. Lately, specific creativity templates were identified underlying American award-earned advertisements (Goldenberg, Mazursky and Solomon, 1999). Studying these templates in Hungarian advertisings is predicted to provide a valuable insight.

In this paper, memorable Hungarian advertisements are investigated in two-fold. First, publicly available, national award-earned press advertisements selected for demonstrating different creativity templates, and are assessed by active Hungarians. It was also judged, whether the advertisements are memorable, and whether they are Hungarian. Second, minimum thirty-year-old adults are asked about old Hungarian memorable advertisement, and the recalled items are used in a qualitative analysis in order to identify their common features. The overall aim is to reveal common features of memorable Hungarian advertisements, including their creativity templates.

2. History of Hungarian advertising

In the sense as it is used today, advertisements appeared as outdoor displays or press releases at the beginning of the 19th century in Hungary. In line with the economic growth, marketing activity became more valued. Several communication channels were introduced to the marketplace (shop-window, advertising pillar, radio, flasher etc.). Gradually, an economic use of these communication channels became common, and focused messages were provided. (MRSZ, 2009)

During the communist area, especially because of the poor state of economy, corporate marketing activity was not typical. Marketing communication mostly conveyed political and social cause advertising messages. A bit later, the national lottery was advertised also.

A remarkable increase of the marketing activity started in the 1970s. The Hungarian Advertising Association was founded in this period. The first big national department-store chain, „Skála", was introduced using modern marketing strategies (e.g., public opinion measurement on consumer needs, call for tender on the name of the department-store) in the 70s. In these years, only a couple of brands per product existed (such as Fabulon cream, Traubi soda, Tisza shoes etc.) and their advertisements were widely known. (MRSZ, 2009)

In the transition period, after 1989, western news, movies, advertisements became available. As a consequence, individualist values became popular in post-communist countries. From the perspective of cross-cultural consumer behavior, a differentiation is made between individualistic and collectivistic cultures (Hofstede, 1980). The individualistic cultures lead independent self construal, and collectivistic cultures lead to interdependent self construal

that is the individual is defined by their descriptive characteristics or by their social role, respectively (Markus & Kitayama, 1991). Socialist countries were clearly collectivist, and western countries were individualists. Hungary is a rather individualistic country now, but still preserves some collectivist values (e.g. conformity), especially the older generations (Manrai, Lascu, Manrai, Babb, 2001). Hungary had a relatively good economic state in compared to the other post communist countries in the transition period, hence Hungarian consumers interiorized individualistic values relatively quickly (Manrai, Lascu, Manrai, Babb, 2001). That is, the differences of Hungarian advertisements partly come from the timing of the interiorization of individualistic values.

In general, five advertising-strategy models are differentiated regarding Hungarian advertising: a hierarchy of effect (Lavidge, Steiner, 1961), AIDA, Dagmar, Rogers and Ad-force (Sas, 2006). However, beyond these, numerous other hierarchical models are known in the marketing literature (see e.g. Barry, Howard, 1990; Töröcsik, 2007). The models are determining the preferred communication styles.

1. The basic hierarchical model (Lavidge, Steiner, 1961) assumes that the massage provides factual information about the brand attributes. Based on the massage, consumer would explore the product and develop affection towards it.
2. According to the AIDA model (Sas, 2006), desire directs the behavior. And desire can be evoked only when attention and interest are already raised. The name of the model is an acronym from attention, interest, desire, and action.
3. The DAGMAR model (Coley, 1961; Sas, 2006) consumers the consumers' behavior rational, and presumes a deeper understanding and conviction as key steps before making a decision. The term DAGMAR stands for Defining Advertising Goals for Measured Advertising Results.
4. The Rogers-type of model (Sas, 2006) states that the consumers should try out the goods, in order to become loyal to the brand. Therefore the aim of communication must be encouraging the consumer to test the product.
5. Finally, an ad-force (Sas, 2006) type of communication aims the consumer's submission through appreciation. Ad-force communication style mainly used by big international companies in the last decades.

For a long period, the advertisement messages conveyed factual information in Hungary. In the 60s, when AIDA was absolutely common in the western countries, Hungary still used DAGMAR messages. In the 70s, the emphasis shifted towards Rogers-type of messages. In the transition period, the AIDA-type advertisements entered the Hungarian market without proper roots. The corresponding advertisements were perceived as fake and manipulative by he consumers, and the responses to these advertisements were very negative. Consumers started questioning and avoiding advertisements. Partly, this rapid change of communication styles is to blame for the overall negative attitude towards advertising. On the other hand, the increasing marketing activity seems overflooded the consumers. (Sas, 2006)

In sum, for a long time, simple demonstration of the product and informative advertisement messages were typical in Hungary. Furthermore, high ad-avoidance is also typical, partly because of the history of advertising in Hungary,

3. CREATIVITY OF ADVERTISEMENTS

It is a major question on the field of psychology of advertisements, what are the distinctive features of memorable advertisements (see e.g., Till, Baack, 2005). The same question can be answered concerning the consumer or the product. Evidently, it depends on for example the interest, involvement, motivation, purchase intention of consumers, whether an advertisement becomes remarkable for them (see e.g., Mitchell, 1993). However, there are generally memorable advertisements. A key issue to memorability seems to be creativity. The most creative advertisements raise attention, interest and stay in memory for a long time (Till, Baack, 2005). Irrespectively of the time frame, whether the recall is asked after hours or decades, creative products must show more success in recall. Furthermore, in a market, where ad avoidance is typical, creativity is a must.

3.1 Concept of creativity

The term creativity incorporates novelty and utility (Burroghs, Moreau, Mick, 2008; El-Murad, West, 2004; Kaufman, 2009; Sternberg, Kaufman, 2010, p. 467). Creative products are novel in the sense that they differ from the commonly accepted, that is they are unique in some way. However, if something is unique and strange, it is probably not creative, as creative products are also adequate to a given purpose. Creative advertisements must be expedient, because the message should hit the target (El-Murad, West, 2004, Koslow, Sasser, Riodan, 2003). Although effectiveness does not necessary go hand in hand with creativity (Moriarty, 1996, Kover, Goldberg, James, 1995), creativity has an effect on its own, for example on recall (Till, Baack, 2005), which is actually a measure of effectiveness.

In the psychological literature, the study of creativity dates back to the 1950s. After Guilford, as the president of the American Psychological Association, gave a talk about the importance of creativity research, this field of research became popular (Kaufman, 2009, p.11). The international popularity of creativity research can be linked to the use of Torrance Test of Creative Thinking (Torrance, 1966, Kaufman, 2009, p. 11). The research follows four basic directions, that is called 4Ps in the literature (see e.g., Kozbelt, Beghetto, Runco, 2010, p. 23). Namely, researchers can focus on person (e.g., Sternberg & Lubart, 1996), place (e.g., Amabile & Gryskiewicz, 1989; Simonton, 1987), process (e.g., Csíkszentmihályi, 1990; Wallas, 1926), or product (e.g. Amabile, 1982, 1996). The research of creative advertisements belongs to the last category: research of creative product.

3.2 Creativity templates

Hofstadter (1984 in Goldenberg & Mazursky, 2008) raised the issue that the creative products have similarities in their deep structures. These underlying structures are providing specific ways to develop unique products. That is, beyond the commonly accepted divergent way of thinking, convergent thinking strategies can also lead to creative solutions. The idea that new thoughts are guided by common abstract schemes is widely supported (e.g., Kauffman, 1995; Kelso, 1997; Minsky, 1985; Simon, 1966).

Goldenberg, Mazursky and Solomon (1999) proved that 89% of American, national award-earned advertisements can be categorized into six creativity templates (p. 344). The templates were inferred based on a selection of award-winning and contest finalist ads in American national advertisement contest (NY, The One Show, USADREVIEW) between 1990 and 1995. A randomly selected group of 500 ads were presented to three senior creative experts, in order to choose the best 200. The individual selections showed a 90% agreement, the rest was resolved in group work. The final set was examined.

Later, Goldenberg and Mazursky (2008) showed that the advertisements which were in line with the identified templates were assessed more original, unique, sophisticated and also evoked more positive attitudes than those which were not. Furthermore, the judges assessed positively these advertisements, even if they were informed about the templates and were able to identify them.

In the following, the six creativity templates are introduced, according to Goldenberg et al. (1999), supplemented by practical observations. The creativity templates, in the order of reported frequency, are the following: pictorial analogy, extreme situation, consequences, competition, interactive experiment and dimensionality alteration. In case of all templates, a couple of versions are differentiated. The numbers in brackets represent categories used in the first study.

– *Pictorial Analogy Template*: A symbol appears in connection with the product. This symbol can simply substitute something (Replacement version (1)): the product, a part of the product, or an item connected to the product or a part of this item. The symbol may be taken to the extreme (Extreme analogy version (2)). Subsequently, a distant association arises, abstract conception is illustrated, that is extreme analogy is created.

– *Extreme Situation Template*: Extreme, unrealistic situation shed light on the product. Either a feature (Extreme attribute version (3) or the worth of the product (Extreme worth version (3)) is demonstrated in the extreme situation. in addition, an absurd alternative can highlight utility (Absurd alternative version (4)). This later version demonstrates an alternative, which is not a rational one.

– *Consequences Template*: It demonstrates an exaggerated consequence of the behavior in line with the message, using the product (Extreme consequences version (5)); or behavior on the contrary, avoiding the product (Inverted consequences version (6)).

– *Competition Template*: the product is portrayed in a competition. Either the product (Worth in competition version (7)) or one of its attribute (Attribute in competition version (7)) is in competition with a concrete or abstract alternative. The alternatives are always feasible, rational. An additional version is when the product is used in a new, surprising way (Uncommon use version (8)).

– *Interactive Experiment Template*: The consumer should actively assist in an experiment in order to receive the message. This experiment demonstrates the worth of the product, and the experiment either requires physical activity (Activation version (9)) or this activity is only imagined (Imaginary experiment version (10)). The activation version is rare in practice.

– *Dimensionality Alteration Template*: The dimension of the product is changed in compared to its environment when the advertisement is using this template. One possibility that the

multiplied product (Multiplication version), or its parts (Division version) are shown in some relation, in order to demonstrate the worth of the product. And this is not a simple demonstration; the items are acting together, or have a clear relation. Another possibility is that the time is changed and the past or the future becomes important in the advertisement (Time leap version (11)). Also, a previously unrelated content can become meaningful, creating a new dimension for the product or for its worth (New parameter connection version (12)). The later version seems very similar to the extreme analogy version of the pictorial analogy template; the main difference lies in the emphasis which either on the use of a symbol or on the new dimension.

Hungarians are said to be creative, which is often demonstrated by the high rate of Hungarian born Nobel price winners (see e.g, Palló, 2005). Studying creativity templates in Hungarian advertisements is expected to show distinctive characteristics as a reflection of Hungarian culture and way of thinking. Furthermore, investigating the creativity templates of memorable advertisements (which are either assessed as memorable, or recalled after a long time) is expected to provide an insight into the significance of these templates while memories are constructed.

4. STUDY OF MEMORABLE HUNGARIAN ADVERTISEMENTS

As it has been mentioned before, two studies were carried out, in order to investigate memorable Hungarian advertisements. Both the memorability and perceived Hungarian nationality of the ads are investigated. As it is a rather complex topic, several methodological questions arose. The below presented two studies should be regarded as possible approaches to this topic.

In *study one*, award-earned advertisements with different underlying creativity templates are presented in an on-line questionnaire. The reactions to the advertisements are analyzed in order to reveal common distinctive features of those which are assessed as Hungarian or assessed as memorable. Furthermore, the specific effects of creativity templates on Hungarians are investigated.

In *study two*, a hundred adults, above thirty, were asked to recall three very old Hungarian advertisements. The recalled advertisements were mainly television advertisements, and these were recalled after decades. The collected ads were investigated in order to identify common descriptive features and their underlying creativity templates.

4.1. Study one
The aim of study one was to explore consumer reactions to advertisements matching with different creativity templates. Additionally, features explaining predicted memorability and perceived Hungarian nationality were studied.

4.1.1. Method
An on-line questionnaire was constructed for data collection. The questionnaire started with three introductory questions about ad avoidance (regarding television, press and outdoor advertisements).

After the introductory questions, 28 press advertisements were judged on eleven items. The advertisements were selected as typical examples of creativity templates. The Hungarian advertisements were selected from a webpage (www.dijnyertes.hu) managed by the Hungarian Advertisement Association, and were used with the agreement of the Secretary of the association. The focus was on press advertisements, as they can be quickly perceived and assessed by the respondents.

As in practice, differentiating ads which focus on the worth or an attribute of a product was very hard, so these categories were merged. Additionally, as simple demonstration of the product and the demonstration of something which is clearly not a feature of a product seemed typical in some Hungarian advertisements, these categories were added. Finally, this approach resulted in 14 creativity template categories, indicated with numbers above in the description. For all categories, two typical examples were selected, yielding 28 advertisements. The only category, where the chosen advertisements were not fully representative was the uncommon use version of the competition template. In the available awarded ads, the usage was moderately surprising. The advertisements used in the questionnaire are shown in appendix 7.1 by creativity template versions.

The order of the advertisements was defined by random number generation. While filling out the questionnaire, one advertisement at a time was presented, and there was no possibility to go back and change the results. In order to balance sequence effect, after 120 respondents completed the questionnaire, the order of the advertisements was reversed. The order of the advertisements is indicated in appendix 7.1.

All items of this part of the questionnaire (of course in Hungarian) answer the same question: to what extent do you think the statement is true for the following advertisement. The opinion was expressed on a seven-point scale with endpoints: minimal, maximal agreements. The statements were following: It is pleasing; comprehensible; imaginative; humorous; surprising; youthful; professional design; memorable; Hungarian advertising; emotional; It has a meaning for me.

The questionnaire ended with demographical questions: age, gender, highest qualification, and place of residence. After the thank words, an e-mail address was provided for further contact about the results. In appendix 7.2, the format of the questionnaire can be seen.

As a pretest of the applied method, 13 students were asked to fill out the questionnaire and share their experiences in the frame of a methodology course. In return, the design, the aim of the study, and the corresponding considerations were explained.

The students felt that the questionnaire was a bit long (the answers were given on average for 25 minutes), but not too long. Some of the advertisements were not clear, because of the quality of the photo. Therefore, a new version was made where the corresponding photos were enlarged and the texts from the ads were added in a separate textbox. Additionally, some of the statements were unclear or alternative constructs were provided by the students. Therefore, in the new version, when the statements first appeared, explanations were given in brackets. It was also indicated that the explanations are only present at the first time. The statements changed in the following way:

1. It is pleasing (for you).
2. It (the message) is comprehensible.
3. It is professional design. (It is a high quality ad.)
4. It is youthful (modern).
5. It is memorable. (Probably, you will remember this.)
6. Hungarian advertising. (It was made by Hungarians.)
7. It has a meaning for me. (You believe the message has hit the target.)

4.1.2. Results

The questionnaire was on-line in the last three weeks of May. Students from three advertisement psychology course (with some overlap) were asked to invite respondents, other student in their BA psychology studies and several acquaintances of the author were kindly invited to fill out the questionnaire. Many people checked the webpage and started responding, but finished after a couple of advertisements. About a quarter of the respondents did not complete the questionnaire, their answers were not processed further.

282 respondents started to fill out the questionnaire (150 started version one and 132 started version two). However, some of the respondents were not motivated enough to fill out the whole questionnaire and gave none or only a couple of answers, their data were eliminated. Some respondents finished the questionnaire after one or two advertisements, but there were none who stopped answering afterwards. Therefore, those who answered each question were probably motivated. Finally, a sample of 211 respondents was analyzed. There were six people not answering the last demographic questions, their answers were still considered, as the resulting distortion of the sample characteristics can be only minimal.
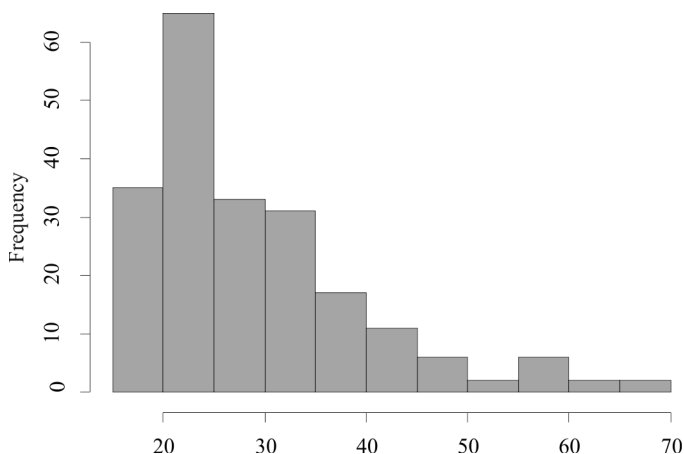
Figure 1. The distribution of age in the sample

In the sample, the average age is thirty, with a standard deviation of 11, and the sample has a positive skew (see *figure 1.*). The age of the youngest and oldest person in the sample is 16 and 69, respectively. 76% of the sample is female. 60% of the sample has a degree, 37%

finished secondary education and 2% has a lower qualification. That is females with higher education around thirty dominate the sample. Therefore, the results can be generalized only with caution. However, this explorative study is still informative.

Most respondents agreed that they ignore television advertisements (with an average of 4.5 on a seven-point Likert scale). The respondents agreed that they did not ignored press advertisements (the average is 3.3), and that they paid attention to outdoor advertisements (the average is 3.8).

4.1.2.1 Perceived Hungarian nationality of the advertisements

The advertisements were assessed to what extent they seem Hungarian, the results are shown in figure 2. The numbers in the figure follow the order of the advertisements in version 1 indicated in appendix 7.1. The advertisements which seemed Hungarian the most are number 11, 22 and 27.

The advertisement with the highest score on this variable is an advertisement of one of the national television channels. The text written on this ad says: If you were a revolutionist, which channel would you capture? This refers to recent political incidents and connected to a national institute, therefore the result is not surprising. The other two advertisements with very high scores advertize Hungaricums: typical Hungarian products. Namely, the porcelain of Herend and paste of Gyermely are shown on them. The second group of rather Hungarian advertisements consists of advertisements number 1, 2, 9, 17, (and with lower values: number 3, 8, 14, 16, 24, 25). Advertisement number 1 compares Chokito to a Hungarian dish (hurka) stating that neither the latter is tempting for the first sight. So, there is a clear reference to a typical Hungarian dish causing the perception as Hungarian advertisement. The remaining ads either advertize a product with a Hungarian brand name or portray common everyday situations, which may create a feeling of familiarity. The advertisement which perceived the least Hungarian is number 20, among a group of number 4, 6, 10, 12, 15 and 26. Advertisement number 20 shows a service linked to a clearly German name. Even the portrayed object, a megaphone is different from the stereotypical one used in Hungary. The other advertisements in this group advertize a products of international, famous brands.

In sum, the result is not surprising, that advertisements which portray a typical Hungarian product, a Hungarian brand or refer to a clearly Hungarian episode perceived as Hungarian advertisements. Beyond these, advertisements with everyday settings are also perceived as Hungarians. Probably the everyday setting evoke feeling of familiarity and therefore the respondents tend to assess the ad as Hungarian.

When the results are considered by creativity template (see *figure 3.*), it should be noted that only two examples were given by template, hence the individual characteristics of the advertisements can have a strong effect. It is the case when the templates are differentiated according to the Hungarian feature. Those templates perceived as Hungarians (extreme attribute/worth, extreme consequence, competition and demonstration what is not a feature of the product), which contain those ads which were presented above as perceived as Hungarians. Therefore, it seems that not the template, but other characteristics play a role here. Consequently, unfortunately, no conclusions can be drawn regarding the creativity templates.
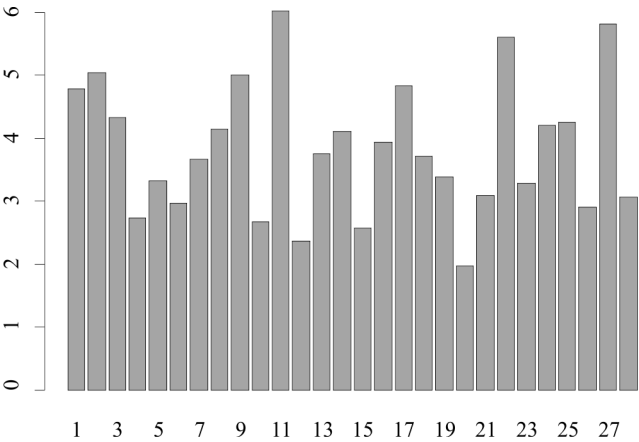
Figure 2. The mean values of perceived Hungarian nationality by advertising
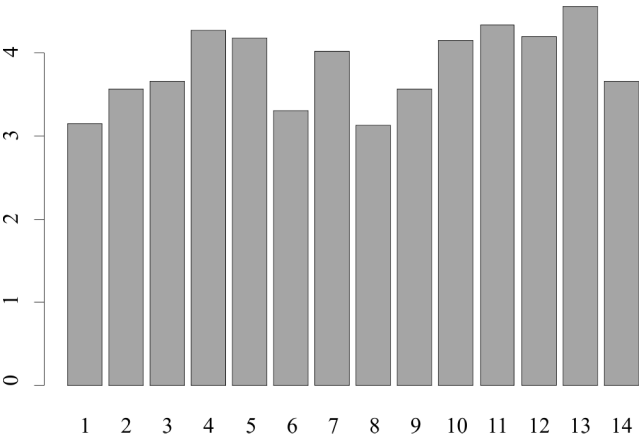

Figure 3. The mean values of perceived Hungarian nationality by creativity templates

4.1.2.2 Perceived memorability of the advertisements

A similar qualitative analysis was followed regarding the memorability of the advertisements. According to the data (see *figure 4.*), the most memorable advertisements are number 18, and 25, closely followed by number 1, 3, 13, and 28. These either raise taboo topics or filled with emotion. Number 18 is a rather sexual Axe advertisement. In number 25, a female give a finger. Number 3 portrays a woman giving fist aid to a mobile phone. Number 1 deals with another taboo topic: ugliness. These ads may be striking, because they are shocking. The rest of this group consists of emotional advertisements. Number 13 provides a glamorous and abstract presentation of a product. And number 28 has a sweet, charming humor, and additionally, it refers to Christmas, and evokes the feeling of wonder expectancy. The least memorable advertisement, dropped far behind all the others, is number 20, which may seem outlandish and probably hard to understand.

As the respondents assessed the ads on their surprising, emotional, and understandable features, the above described explanations were easily tested. The most surprising ads are number 25, 18, 1, 11, 13 and 3, with mean values of 5.35, 4.95, 4.77, 4.5, 4.47, and 4.45, respectively. Hence, most of memorable advertisements are indeed surprising for the respondents. The most emotional advertisements are number 17, 13, and 18 with an average value of 4.82, 4.76, and 4.1. Ad number 28 is emotional, but not extremely, its average value was 3.76. Therefore, the explanation that ad number 28 is memorable, because this is emotional is not supported by the data. However, in ads number 13 and 18, emotionality can play a role in memorability. The hypothesis that ad number 20 is not very clear for the respondents was confirmed, the corresponding average value was 2.54
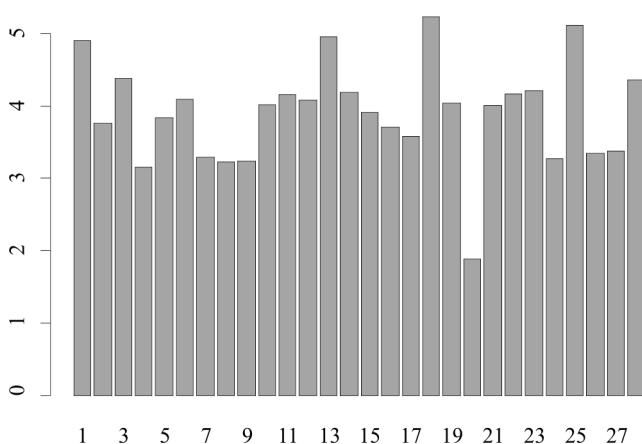
Figure 4. The mean values of perceived memorability by advertising
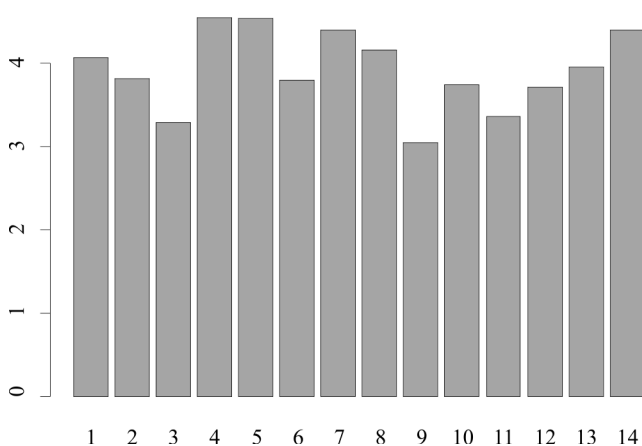
Figure 5. The mean values of memorability by creativity templates

When the memorability of advertisements is looked at by creativity template, again, the extreme values of individual advertisements affect the values of creativity templates (see figure 5). Therefore, unfortunately, memorability of the creativity templates cannot be assessed.

4.1.2.3. Underlying features of perceived memorability of the advertisements
In order to reveal the important features of memorable advertisements, linear regression analysis was planned with memorable as a dependent variable and all other variables as independent variables. However, as the data is three-dimensional, the data analysis was not very straightforward. The three dimensions were: person, advertisement, statement. As a solution, stepwise regression models were fitted by creativity templates. This method does not provide a prediction of the effect of the creativity templates on memorability, but of the effect of the underlying features. Although the features of individual advertisements may dominate the features of the creativity templates, if common characteristics can be filtered out from the linear regression models fitted to memorability by creativity templates, memorability can be linked to these characteristics. In the analyses, the mean values over the two example advertisements by creativity templates were used as input data. The independent variables were standardized, in order to obtain comparable parameter estimates in the linear regression models.

The significant (α=0.05) parameter estimates of the variables (after removing the non-significant ones) are shown in Table 1 together with the multiple R^2. According to the results, the following features of advertisements play a role in (predicted) memorability: pleasing, imaginative, surprising, youthful, professional, emotional, and "has a meaning for the person". With maximum these seven variables (see below) from 56 to 78 percent of the variability of predicted memorability is explained.

Humor is generally regarded to have an effect on memory (see e.g., Chung, Zhao, 2003; Weinberger, Gulash, 1992;Weinberger, Spotts, Champbell, 1995) , but it is also shown that the relation is not linear, but has a reversed U-shape (see, e.g. Krishnan, Chakravarti, 2003), which explains why this linear relation is not appeared as a significant one. Humor relevance is also a consistent issue in related studies, which is treated as a feature that is responsible for ad effectiveness. It is also noted that humor may distract attention (see, e.g. Hansen, Strick, Hooghuis, Wigboldus, 2009; Krishnan, Chakravarti, 2003).

In the present study, surprise, emotion and youthfulness seem the most important features of memorable advertisements, as these appear in most linear regression models. An advertisement can be surprising in several ways: it can be shocking, or it can present an extreme idea, or association. When advertisements break norms, they also raise attention resulting in high recall rates (Dahl, Frankenberger, Manchanda, 2003). Shocking advertisements also evoke more feelings (Dahl, Frankenberger, Manchanda, 2003). The effect on memory can be explained by the theory of selective perception as well. The consequent of selective perception is that extreme stimuli gain more attention as it is more informative in adapting behavior (de Mooij, 2010, p.50). Another approach emphasizes the well-known aha-effect (Auble, Franks and Soraci, 1979). When the receiver needs to actively decode the message, the process has a

positive effect on memory, consequently the message is likely to be recalled. The same effect is demonstrated already for visual images (Wills, Soraci, Chachile, Taylor, 2000).

Table 1. Parameter estimates of the scaled variables in the final linear regression models

	Pleasing	Imagin.	Surprise	Pro.	Young.	Emotional	Has a meaning	R^2
Replacement	-	-	0.19	0.29	0.15	0.19	0.15	**0.63**
Extreme analogy	-	-	0.24	0.20	0.15	0.24	0.18	**0.64**
Absurd alternative	-	-	0.27	-	0.33	0.27	0.16	**0.69**
Extreme attr. or worth	-	0.19	0.17	0.16	0.21	0.16	0.14	**0.68**
Extreme consequences	0.23	-	-	0.24	0.28	0.30	-	**0.78**
Inverse consequences	-	-	0.24	0.19	0.21	0.36	-	**0.59**
Attr. or worth in competition	-	-	0.29	-	0.33	0.36	-	**0.71**
Uncommon use	0.26	-	0.20	-	0.23	0.32	-	**0.71**
Activation (Experiment)	-	0.17	0.25	0.20	-	0.39	-	**0.76**
Imaginary experiment	0.27	-	0.26	-	-	0.37	0.13	**0.76**
Time leap			0.19		0.23	0.27	0.29	**0.56**
New par. connection	0.19	0.25	0.18	-	-	0.38	-	**0.71**
Demonstration		0.20	0.24		0.25	0.24	0.12	**0.78**
Demonstration (not an attr.)	-	-	0.33	-	0.29	0.37	-	**0.61**

When emotions are linked to messages, the resistance to receive the massage is decreases. Emotions are often used in persuasive messages as they affect memory (see e.g. Mehta, Purvis, 2006) which can be explained by classical conditioning (Zanna, Kiesler, Pilkonis, 1970).

In order to understand the effect of youthfulness, the perception of this feature was studied by advertisements, see Figure 6. The advertisements with the highest score on this variable are number 18, 21, 10, closely followed by advertisement number 3, 7, 13,14, 25. Following a qualitative approach, looking at these advertisements, three categories can be differentiated. Some of the above selected advertisements are provocative, involving imprudent attitude or behavior norms, such as ads number 18, 25 and probably 13). Another group of advertisements evoke parties, namely number 3, 7, 21. Or they portray youth, such as advertisements number 10 or 14.
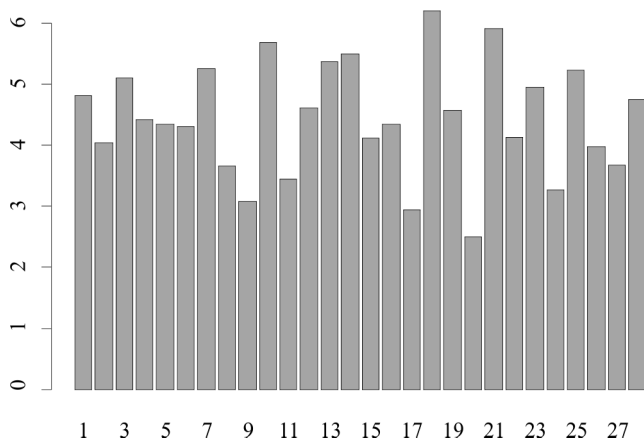
Figure 6. The mean values of youthfulness by advertisements

However, it is still unclear, why these advertisements are so memorable. Probably they are memorable because of their dynamic, modern, eye-catching character. Further analysis would be needed in order to increase the validity of the result.

4.2. Study two

Study two investigates advertisements which are so remarkable that they are recalled after decades. In other words, the present study focuses on communicative memory (Assmann, 1999, 2008 in Kovács, 2010, p. 84; Pántya, 2010, p.136), as the investigated memories are dated not earlier than 80 years, and the respondents age group probably share experiences and also may communicate about them.

The features and creativity templates of the recalled ads are investigated. However, it must be noted that several factors may influence the recalls, such as age of the respondent and utility of the product at the time of encounter; marketing activity of the brand; broadcasting frequency etc. There were brands which had been frequently advertized, and that is why the information was easily accessible for the respondents. Furthermore, several documentaries had been broadcasted dealing with the sixties, seventies and eighties in Hungary. Therefore, the results should be assessed with caution. However, the study provides realistic data in respect to the long term memory approach, hence it worth an attempt. In order to ensure that the respondents are able, at least in principle, to recall ten-year-old or older advertisements, only the data of respondents above thirty were analyzed.

4.2.1. Method

The inquiry took place at the end of May and the beginning of June in 2011, in public places in Debrecen. The respondents were asked after a short introduction "Could you, please recall, three, old, Hungarian advertisements?". As mainly television advertisements were recalled, the locally restricted sample does not seem very problematic. After recording the answers, three demographical data were registered: gender, year of birth and the highest qualification. The later was coded as elementary education, secondary education or higher-forms of education.

During data collection, several unexpected difficulties arose. Although fulfilling the task did not take a long time, so the data collection seemed easy. Surprisingly, many people could not recall three old advertisements, often could not name any. Others either answered some nonsense or pretended to recall some advertisement, but could not tell any element of that beyond the brand name. Again, another group of people could describe the ad, but could not recall the brand. Sometimes, the advertisement and the brand name were mixed. A typical example of that was referring a soft-drink advertisement where the question "Is there Agi?" was raised (Agi is a typical female Christian name in Hungary), and Coke was named as the product. In fact, the brand of the referred refreshment was Agi. Only when the advertisement could be traced back unambiguously was the data kept. The answers of respondents under the age of thirty were not considered either. Furthermore, some respondents recalled four to seven advertisements in a quick sequence, from these, only the first three were taken into account.

4.2.2. Results

The sample consists of 100 respondents with equal number of males and femails. Four respondents finished only elementary school, 39 finished secondary education and 57 finished higher forms of education. The majority of the sample is between 30 and 50 years-old. As it can be seen on figure 7, the distribution of age has a positive skew. The reason can be that many elderly potential respondents did not want or could not recall any advertisements. Some of those who rejected to give an answer even stated their disproval, expressed negative feeling towards advertisements or suspected some underlying motive of the enquiry, such as the wish to sell some product.
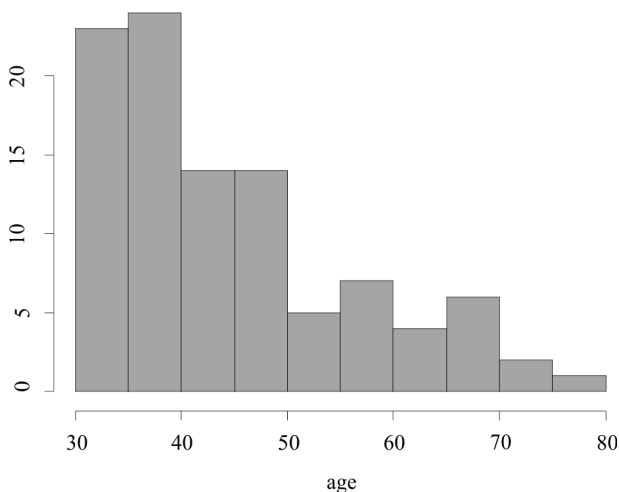

Figure 7. The distribution of age in the sample

During the enquiry, it was typical that the respondents were so surprised by the question that they could not really deal with the question for minutes. Sometimes a pair started to recall advertisements, inspiring each other, laughing and enjoying the task. In such cases, individual

responses were administered. Often, not the advertisement, but the rhyme of the advertisement was recalled.

The data were summarized in two ways: (1) The frequency of recalled advertisements was studied by three age categories (30-39, 40-49, and 50-79) with approximately equal number of respondents. (2) Furthermore, the overall recall rate was also calculated. Many of the advertisements were recalled by only a couple of people. Finally, the ten overall most frequently recalled advertisements were analyzed in a qualitative way.

Table 2. Frequently recalled advertisements by age groups

30-39	40-49	50-79
Fabulon Nyakra-főre (7)	Skála kópé (10)	Traubi Dupla buborék (11)
Skála kópé (6)	Májas-hurka (9)	Skála kópé (9)
Sugár (3)	Traubi Dupla buborék (7)	Müszi (7)
Bontott csirke (3)	Bontott csirke (4)	Májas hurka (6)
Müszi (3)	Müszi (4)	Pécsi kesztyű (6)

In *Table 2.*, the frequently recalled advertisements per age group are shown, in brackets, the number of recalls is provided. Most of these advertisements are recalled in all groups, however the order and some choices of advertisements show some kohort effect. It is not easy to reveal why the advert of Pécsi kesztyű was so memorable of the oldest age group and the ad of Fabulon was so memorable of the youngest age group. The reason can be the broadcast frequency in their teenager and adult age or their interest at the time of broadcast. However, there are advertisements appearing in all age groups, which must be remarkable for all without an age effect.

In *Table 3.*, the most frequently recalled advertisements (overall) are shown in the order of recall rate, most of them are still available on the internet (see appendix 7.3). Considering their creativity templates, the following types are present: demonstration (Bedecó, Márka), extreme consequences (Májas-hurka, Fabulon) inverse consequences (Bontott csirke, Casco), multiplication (Pécsi kesztyű), new parameter connection (Skála, Ha ide bemegyek).

When the features of the advertisements are looked at, a category with cartoons can be differentiated (Skála kópé; Skála, ha ide bemegyek; Traubi Dupla buborék; Bontott csirke). Many of the advertisements portrays children (Skála kópé; Skála, ha ide bemegyek; Traubi Dupla buborék; Májas hurka; Bedeco). Both the presence of a cartoon, or children in the advertisement can recall positive emotions. Many frequently recalled advertisements are surprising or shocking (Májas hurka; Müszi; Bontott csirke; Bedeco; Cascot akarok). Others seem very youthful as portrays young people (Fabulon; Pécsi kesztyű; Márka). These findings are in line with the conclusions of study one.

Table 3. Frequently recalled advertisements (overall)

Skála kópé (25)
Traubi Dupla buborék (18)
Májas hurka - véres hurka (17)
Fabulon Nyakra-főre (16)
Müszi (14)
Pécsi kesztyű (11)
Bontott csirke (8)
Bedeco Míí? Bedeco (8)
Cascot akarok (6)
Márka (6)
Skála Ha ide bemegyek (6)

5. CONCLUSIONS AND DISCUSSION

From study one, it seems that consumers perceive an advertisement Hungarian if it advertize a typical Hungarian product, brand or refers to a Hungarian event, custom. However, the respondents also perceived the ads as Hungarian if it portrayed an everyday situation or setting.

Unfortunately, the results of study one did not provide any information regarding the perception of creativity templates. But the features of memorable press advertisements investigated in this study were revealed. The qualitative analyses of the data, that shocking shown that advertisements, either containing taboo or erotic content, perceived as memorable by the respondents. Such advertisements both evoke strong feelings and raise attention. Furthermore, the advertisements which evoke positive feelings were perceived as memorable. From the linear regression analyses, the above mentioned two features seemed dominant. Additionally, the feature of youthfulness was found as important. An advertisement is youthful if it is provocative, or portrays young, dynamic people, or parties.

In study two, during data collection, it seemed that advertisements with a rhyme are recalled easier after decades. And following a qualitative analysis of the most frequently recalled advertisements, similar features seem important in the memorability than in study two. Namely, the revealed common features are surprising, shocking and youth. Regarding the creativity templates, mostly demonstration, consequences, multiplication and new parameter connection appeared in the recalled ads. However, it can be by chance as no other study affirmed these findings: further research is needed regarding the creativity templates.

The validity of the findings could be increased by further studies on the memorability of advertisements. For example, memorability could be investigated in experiments, where advertisements with the revealed features and with the lack of those would be presented to the subjects. It would be important, that the subjects meet the ads only in the laboratory setting; therefore the selection of advertisements would be crucial. Furthermore, the perceived memorability of television advertisements should be investigated. Additional features could

be filtered out from the literature and could be added to the list of investigated features.

Unfortunately, because of the dominance of couple of advertisements, the effect of creativity templates is not clear from the studies. The creativity templates should be studied in different ways, such as e.g. using a set of templates or reducing the number of questions per advertisements. Additional studies could provide an insight into the effect of the creativity templates, and a deeper understanding of the memorability of advertisements.

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7. APPENDIX

7. 1. Advertisements in study one
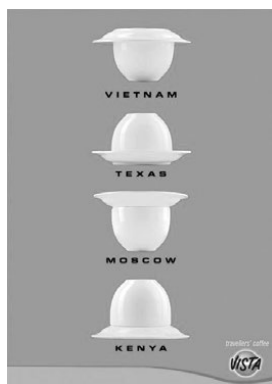
Pictorial Analogy Template Replacement version, ads number 15 and 10

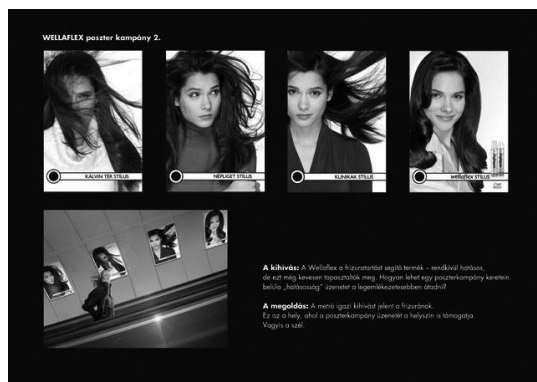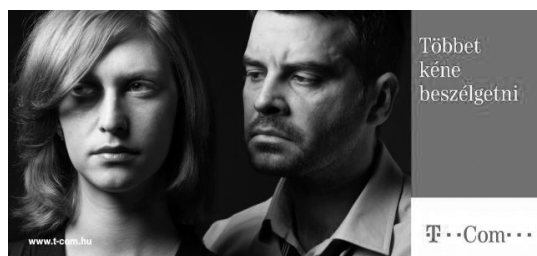Pictorial Analogy Template Extreme analogy version, ads number 12 and 26

Extreme Situation Template Absurd alternative version, ads number 3 and 20

Extreme Situation Template Extreme attribute or worth version, ads number 11 and 13

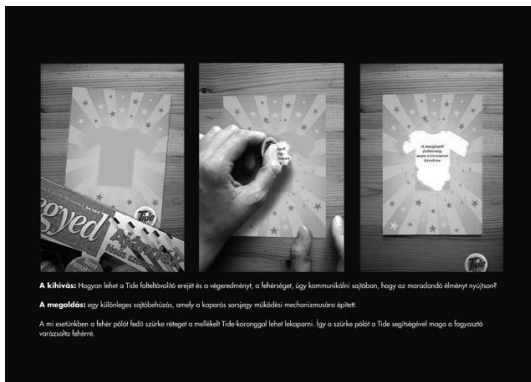Consequences Template Extreme consequences version, ads number 14 and 18

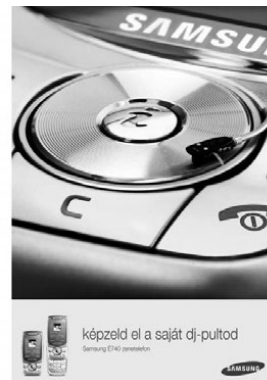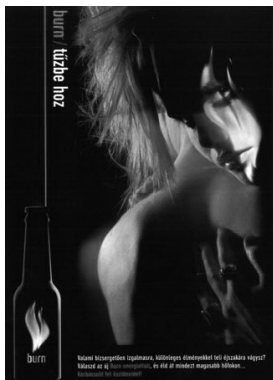Consequences Template Inverted consequences version, ads number 17 and 19

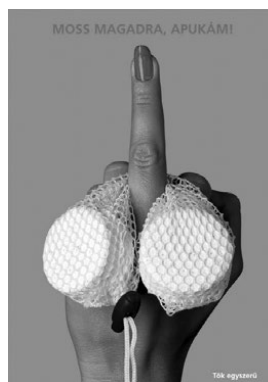Competition Template Attribute or worth in competition version, ads 16 number and 28

Competition Template Uncommon use version, ads number 6 and 23

Interactive Experiment Template Activation version, ads number 24 and 9

Interactive Experiment Template Imaginary experiment version, ads 7 number and 21

Dimensionality Alteration Template Time leap version, ads number 2 and 8

Dimensionality Alteration Template New parameter connection version, ads number 22 and 5

Demonstration The product version, ads number 27 and 4

Demonstration What is not an attribute version, ads number 1 and 25

7.2 First two pages of the online questionaire

Kedves Kérdőívkitöltő! A válaszadásával a Debreceni Egyetem Pszichológia Intézetében zajló reklámpszichológiai témájú kutatáshoz nyújt segítséget. Az adatok anonim módon kerülnek feldolgozásra. 28 nyomtatott reklámról kérjük, hogy fejezze ki véleményét, a kérdőív kitöltése átlagosan 25 percet vesz igénybe. A válaszokat nagyon köszönjük!

Start

1.

Mennyire jellemző Önre az alábbi állítás?

		Minimálisan				Maximálisan		
	Mindig átlapozom a sajtóhirdetéseket.	⟲	⟲	⟲	⟲	⟲	⟲	⟲
	Mindig elkapcsolok, ha a televízióban reklámblokk kezdődik.	⟲	⟲	⟲	⟲	⟲	⟲	⟲
	Mindig megnézem az utcán a plakátokat.	⟲	⟲	⟲	⟲	⟲	⟲	⟲

Tovább

Az első reklámnál zárójelben található megjegyzések segítik az állítás értelmezését, a második reklámnál már csak az állítások rövid verziója szerepel. Az állítások értelmezése a kérdőív során nem változik.

2.

Ön szerint mennyire igaz az alábbi reklámra a következő állítás?

		Minimálisan				Maximálisan		
	Tetszik (Önnek).	☐	☐	☐	☐	☐	☐	☐
	Érthető (az üzenete).	☐	☐	☐	☐	☐	☐	☐
	Ötletes.	☐	☐	☐	☐	☐	☐	☐
	Humoros.	☐	☐	☐	☐	☐	☐	☐
	Meglepő.	☐	☐	☐	☐	☐	☐	☐
	Profi a kivitelezés. (=Formailag minőségi reklám.)	☐	☐	☐	☐	☐	☐	☐
	Fiatalos. (=Modern.)	☐	☐	☐	☐	☐	☐	☐
	Emlékezetes. (=Valószínűleg emlékezni fog rá.)	☐	☐	☐	☐	☐	☐	☐
	Érzelemteli. (=Érzelmeket vált ki Önből.)	☐	☐	☐	☐	☐	☐	☐
	Magyar reklám. (=Valószínűleg magyarok készítették.)	☐	☐	☐	☐	☐	☐	☐
	Nekem szól. (=Úgy érzi az üzenet célba ért.)	☐	☐	☐	☐	☐	☐	☐

Tovább

7.3. The internet access (if available) of the most frequently recalled old advertisements

Table 4. Access to frequently recalled advertisements (17.06.2011.)

Skála kópé (25)
Traubi Dupla buborék (18) http://www.youtube.com/watch?v=MtfF3fxg2K8&NR=1
Májas hurka- véres hurka (17) http://www.youtube.com/watch?v=eN7RhYFIS7E
Fabulon Nyakra-főre (16) http://www.youtube.com/watch?v=eMabbm7FqEM
Müszi (14) http://www.youtube.com/watch?v=XCW48PrV7YM
Pécsi kesztyű (11) http://www.youtube.com/watch?v=2BsjXIg5uE4
Bontott csirke (8) http://www.youtube.com/watch?v=c6DZktvqlIE
Bedeco Míí? Bedeco (8)
Cascot akarok (6) http://www.youtube.com/watch?v=BqHp5PtPOx8
Márka meggy (6) http://www.youtube.com/watch?v=rZ9Xw8gaA7Q
Skála Ha ide bemegyek (6) http://www.youtube.com/watch?v=81Tk6SYxvkQ

REACTIONS TO TRAUMATIC EVENTS: CHARACTERISTICS OF COMMUNICATION ENSUING THE RED SLUDGE DISASTER IN HUNGARY, OCTOBER 2010

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ABSTRACT

Our study analyzes the communication, the cognitive knowledge and the emotional responses related to the red sludge disaster in Hungary, in October 2010. We have studied the written answers to structured and open questions of 610 interviewees from four different towns other than the scene of the catastrophe. The research covered the first month following the event.

We found that geographical distances and gender differences affected the responses. Women displayed higher emotional responses; presumably they need a bigger social support in coping with traumatic events of the community. One month after the disaster there was still a relatively lively communication and interest concerning the event. Media comments relating to the disaster in the same period of time were constantly and considerably decreasing. Patterns of media narration represent and may as well influence the processing of the event in the community.

Results of the research may add to the better understanding of the nature of processing traumatic events in the community; they may serve as signposts to the implementation of

psychological intervention; and they may as well help to understand the complex nature of media effects.

A year after of the tragedy two memorials were dedicated to the victims of the disaster in Kolontár and Devecser. Both settlements had been affected by the disaster, and their inhabitants suffered the immediate consequences of the devastation. Speakers of the first anniversary commemorated the tragedy by recalling the process of the common elaboration on the collective tragic event. We have intended to follow the cognitive and emotional dynamics of the communication concerning the disaster in our sample in the first month of a supposedly long process at the end of which a collective traumatic event is becoming part of the national memory.

1. INTRODUCTION

A certain amount of people (20-30%) cannot process a traumatic event at all, however, they share as much as 95% of their experiences on the very day of the event. In certain cases the exchange about the traumatic event can lead to the suspense of the emotional stress, that is, to a constant pondering over the event. Nowadays disturbing events are often broadcast in the media. As a consequence of globalization of news they have their effects regardless of geographical distances. Physical closeness or personal involvement may enhance reactions to traumatic events. They turn into narratives whose emotional elements affect their communicational needs. The increased communicational need is a natural consequence of experiencing events of social stress.

In certain cases traumatic events may become part of the collective memory. If, for example, there is a loss related to public figures or values they may even become a part of the national memory. Natural and industrial disasters, due to their shocking nature count as slings, and the dynamics of the time needed for their processing can well be detected.

How a traumatic event, which is not of historic or political significance becomes a part of the national memory is a question of debate. Our research analyzes the reactions in the first month following an industrial disaster that got in the focus of the national and international media. We are aiming at finding out about how it is going to become a part of the national memory. We understand that the question of responsibility and the processes of rescue operations, psychological rehabilitation represent a social issue and are not without political considerations. The rescue operations of government organizations and NGOs can be considered a serious national issue.

The international media is attaching a national character to the event and calls it an "Hungarian" disaster, comparing it to other international events. We have intended to follow the cognitive and emotional dynamics of the communication concerning the disaster in our sample in the first month of a supposedly long process at the end of which a collective traumatic event is becoming part of the national memory.

Public remembrance of the first anniversary seems to support the feasibility of the red sludge disaster becoming a site –both physically and spiritually– of the national memory.

A possible way of processing individual traumatic events is emotional writing, which means writing about emotions constantly for a period of time, possibly without critical considerations. Writing of this kind, perhaps as a diary, might have a therapeutic effect (Niederhopffer & Pennebaker, 2005).

The media is focusing on the representation of serious events, the process of finding meaning, and the stages of the coping process. The method of the collective processing of the disaster affects the health and mental conditions of those most directly involved in the disaster (Gorter & Pennebaker, 2003).

Hungary had its largest industrial disaster when a red sludge reservoir of the Hungarian aluminium company (MAL Co. Ltd.) leaked, and flooded its immediate surroundings on 4th October 2010. The reservoir, owned by MAL Co. Ltd., is in an area between Ajka and Kolontár, and it is 300x500 m in size. The red sludge which leaked during the disaster (appr. 600-700,000 m3) flooded the lower parts of three settlements, Kolontár, Devecser and Somlóvásárhely. The alkalic, highly corrosive industrial waste material spread over 40 square kms causing a huge economic and ecological disaster in the region of Ajka. Ten lives were lost and injuries were over 150. All living creatures of two small rivulets (Torna and Marcal) were also killed by the alkalic waste material.

2. CONTEXT AND RESEARCH LITERATURE

2.1 Social periods of reaction to disaster

An increased communicational need is a natural consequence of experiencing events of social stress. The number of self-reports and exchanges concerning the self-reports became exceptionally frequent in the first two weeks following the earthquake in San Francisco (1989), and the start of the Gulf War (1991) (Pennebaker & Harber, 1993). Writing and the exchange about writing facilitate the creation of interpretation, and the shaping and processing of emotions concerning the event (Niederhopffer & Pennebaker, 2005). The repetitive process establishes remembering in the future, and the traumatic events turn into digestible memories in the future.

In the research literature of traumatic experiences three social stages relating to disasters and wars have so far been identified.

At the beginning of the *emergency stage*, in the first two or three weeks interviewees very often think or talk about the event. This is the time of social bonding when people engage in exchanges and talking with neighbours and strangers in an unusual way. This intensified need for communication is similar to the experience of people who have lost a beloved relative.

The *inhibition stage* starts two-three months after the event, and lasts for a few months. In this stage individuals gradually reduce exchanges relating to the event, however, they still keep thinking about it. They might be ready to tell others their own stories, however, they are no longer able to digest those of others'.

The *adaptation stage* is an unstable one indicating that people are continuing their lives. Authors are supposing that a number of additional processes are going on in this stage that will unfold months or years later. This is an uncertain model, which is based on research on a relatively short period of a powerful event of upheaval when the infrastructure was not considerably damaged.

Physical syndromes that might appear after the traumatic events are reported in the *inhibition stage* rather than in the *emergency stage* or the *adaptation stage* (Pennebaker & Harber, 1993).

An article of broader analysis on this topic has already been published (Pék, 2010).

2.2 The role of the media in the social coping process

The media is an important field for the treatment of traumatic events. Articles of the printed or the electronic media – especially a medium that represents the given community – become the narratives of the social experience of the community. Newspapers, like mirrors, reflect the processing of the tragic event in society. This way these events become more acceptable for society on both individual and cultural level.

Analyses of articles about disasters show that the articles reflect social and psychological processes going on in society. They serve as the providers of scripts to traumatic events. They provide a basis for social processes in finding and providing meaning. Within the frameworks of journalism they represent social narratives, and journalistic objectivity in finding and providing meaning helps communities to find control over the traumatic event. News and commentaries may help communities to process the tragedy. They also represent the emotions of the community, and the intention to understand consequences. Media criticism refers to the fact that the process the media is commenting on from the communication of the trauma is actually parallel with the stages of coping.

It is also presumable that the trauma shared by so many might influence the stress level of the whole community and their physical health throughout the whole coping process (Gortner & Pennebaker, 2003).

3. Aims

In our research we are focussing on analyzing emotional reactions and cognitive narratives caused by the red sludge disaster, and its communication in the media. The first month of reactions to public events following disasters is always highly important as the first weeks count as the emergency stage which is characterized by an extra need for communication and an abundance of emotions.

Another aspect of research was to follow on-line contents of the media in the same period of time. Media on-line contents, of course, have their own dynamics different from other segments of the media.

We were also aiming at identifying and analyzing characteristics of emotional reactions relating to the disaster. Similarly, we were trying to grasp regional differences representing the four localities of our interviews.

4. Hypotheses

4.1 We were supposing that emotional reactions, communicational needs and intentions had an inverse relationship to geographical distance.

4.2 We were also supposing that the communication of the disaster would display a similar progression to the ones reported in the international research literature. Our research period covered the first month including the "emergency stage," thus we were supposing a growing frequency in the beginning and a falling frequency of communication at the end of the period.

4.3 As regards media on-line contents, we presumed that they would display a similar progression, that is, we were expecting similar dynamics among the fields observed.

4.4 As for emotional reactions, we were expecting gender differences in both contents and intensity. We were supposing that women would report more emotionally negative reactions.

5. Material and method

Our questionnaires, specially developed for this purpose, were recorded in the first 33 days following the disaster. We recorded them with 613 interviewees, mainly students. The localities were Sopron, Budapest, Debrecen and Nyíregyháza. 90% of interviewees were students of universities and colleges. The questionnaire had two parts: the *first,* beside a statistical heading (age, sex, date of completion) had two open questions referring to the emotional reactions and cognitive knowledge of the person. The *second* had closed questions referring to the frequency of communication and the need of communication about the disaster in the past 24 hours.

We used the method of content analysis and based our analysis on the Regressive Imagery Dictionary (RID; Martindale, 1969). The Hungarian version of RID, which is based on the psychoanalytic theory has been developed by Gergely Szabó in 2010. The dictionary can be applied to the analysis of altered states of consciousness (Martindale & Martindale, 1988). The translated versions of RID have been successfully applied in psychoanalytic research, as for example in the content analysis of first interviews (Frommer et al., 2005). The theory of RID postulates that special changes of consciousness produce special language representations.

The Kruskal-Wallis test and the Mann-Whitney U test were applied for processing statistical data.

6. Results

6.1 The role of the geographical distance

In processing the data we used the Kruskal-Wallis test to learn about the differences among eight variables in the samples of the four localities. The eight variables were the answers to the following questions: how many times they talked about the disaster to others (1), to one person (2), in company (3); how many times they thought about it (4); how many times they heard others talking about the disaster in the media (5); how many times they heard others

talking about the disaster out of the media (6); how many times they would have liked to hear news about the disaster (7); how many times they would have liked to talk about the disaster (8). All questions were referring to the 24 hours prior to the interview.

Four out of the eight variables showed significant differences concerning the localities of the research.

a) In the past 24 hours, how many times did you talk to others about the disaster?, or did you share your knowledge, your opinion or your emotions about the disaster? (1)
b) In the past 24 hours, how many times did you talk to one person about the disaster? (2)
c) In the past 24 hours, how many times did you talk about the disaster in company (at least 2 people)? (3)
d) In the past 24 hours, how many times did you think about the disaster without talking to others? (4)

Results:

a) There are significant differences among the localities of the survey in the number of times interviewees (N=610) were talking to others about the disaster.

In Nyíregyháza interviewees talked to someone the least often; then in Budapest, and then in Debrecen. Interviewees in Sopron reported the highest number of occasions they talked to someone about the disaster (the result is statistically significant; significance: $p<0.000$; chart 1).
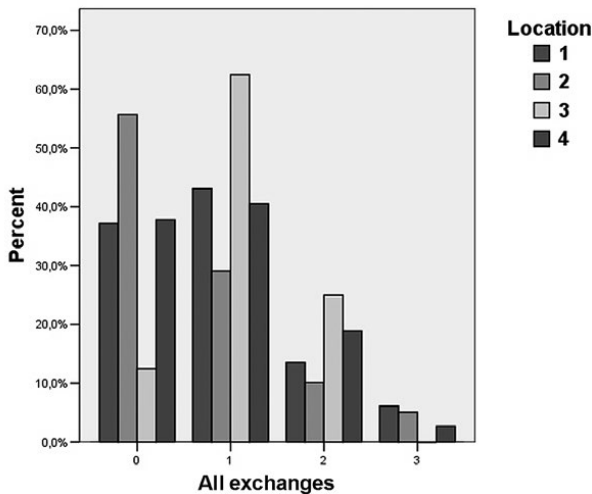
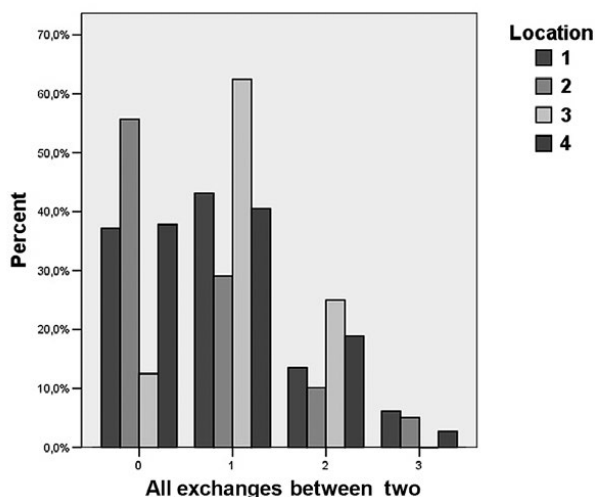The Kruskal-Wallis test was applied.

Figure 1.

Figure 2.

How many times interviewees talked about the disaster in four cities
(Debrecen 1, Nyíregyháza 2, Sopron 3, Budapest 4)

b)   There is a significant difference in the number of occasions interviewees (N=610) talked to one particular person about the disaster.

In Nyíregyháza interviewees talked to the fewest number of people; the second fewest was in Debrecen, and then in Budapest, and in Sopron interviewees had the highest number of people they talked to about the disaster (the result is statistically significant; significance: p=0,015) *(Figure 2.)*

The Kruskal-Wallis test was applied.

c)   There are significant differences among the cities in the number of times interviewees (N=610) talked to others in a group about the disaster.

(Nyíregyháza < Budapest < Debrecen < Sopron)

(p=0.076; *Figure 3.*).

The Kruskal-Wallis test was applied.

d/ There are significant differences among the cities in the number of times interviewees (N=610) thought of the disaster.

Interviewees in Sopron thought of the disaster most often, less often in Debrecen, then in Budapest, and least often interviewees in Nyíregyháza thought of the disaster.

(p=0.003; Figure 4).

The Kruskal-Wallis test was applied.

How many times interviewees in the four cities were thinking about the disaster (Debrecen 1, Nyíregyháza 2, Sopron 3, Budapest 4)
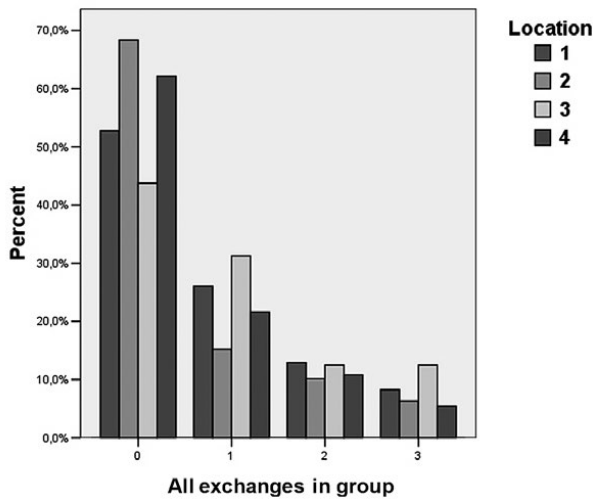
Figure 3.
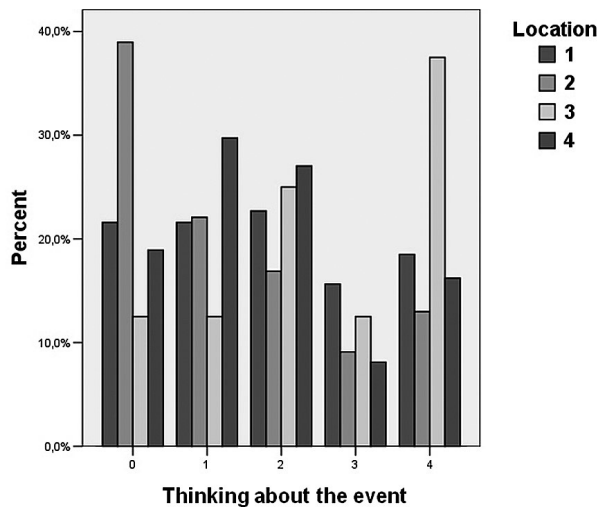
Figure 4.

6.2 Changes in time

We observed how interviewee answers changed in time. There is a similar progression in time among the eight variables: there are higher activities on the eleventh day and between the 15th and the 17th days (they talk more, and they think more about of the disaster on these days).

Two weeks after the disaster there is an ebb in communication, and then a rolling follows with ups and downs there is a rise, and then, even after two months there is a frequency similar to that of the beginning of the second week. As the progression is similar, results are displayed in one chart together with the results of the "talk in company" question. *(Figure 5.)*
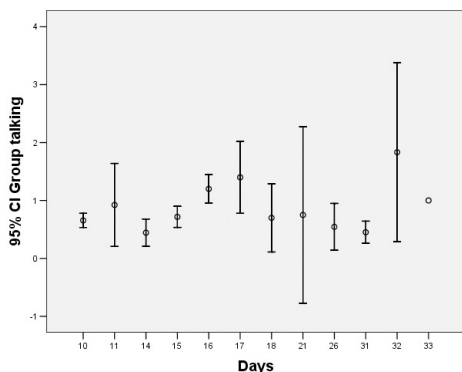
Figure 5.

6.3. On-line contents

6.3.1. The frequency of on-line news

To follow the frequency of daily news on the disaster for one month the Google internet search system was used. After 16 days the frequency of written news fell under ten per day, that is, from that time on the frequency of written news fell under a fourth of the first days. After a month the figure fell less than five per day 0 *(Figure 6.)*.
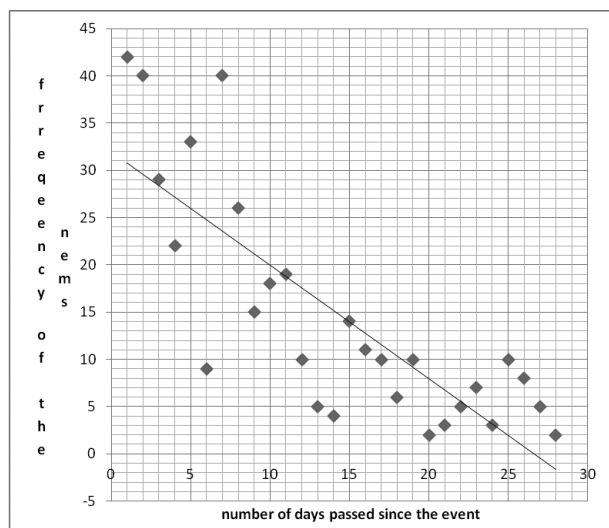
Figure 6.

6.3.2. The frequency of online videos

To follow the dynamics of uploading videos we also used the Google search system *(Figure 7.)*

A similar dynamics to written news is observable: after Day 18 uploading is under ten per day, whereas in the first week it was more than its double. After a month the figure falls under five.
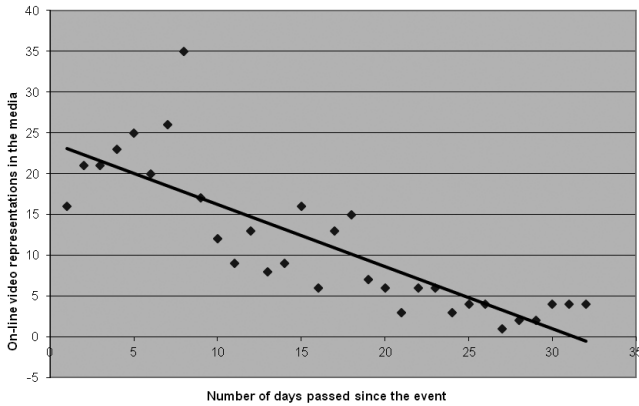
Figure 7.

6.4. Results of content analysis

We applied content analysis to the answers to two open questions: "What do you know about the red sludge disaster?" and "What emotions have you got in connection with the disaster?"

6.4.1. Results of three categories of content analysis

We observed three categories: emotions, symbols of defence, and regressive thinking.

Of the three categories two had statistically significant differences: emotions and symbols of defence (p<0,000; p=0,0060).

Women apply more emotional categories, and use more words that belong to defensive symbols in their answers *(Figures 8. 9.)*.
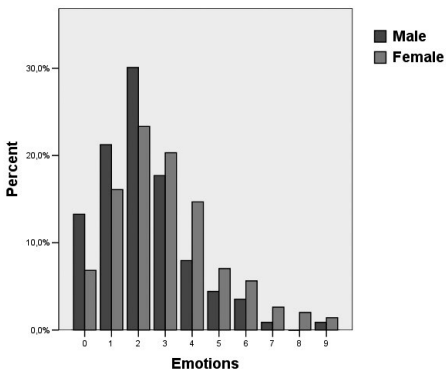
Figure 8.
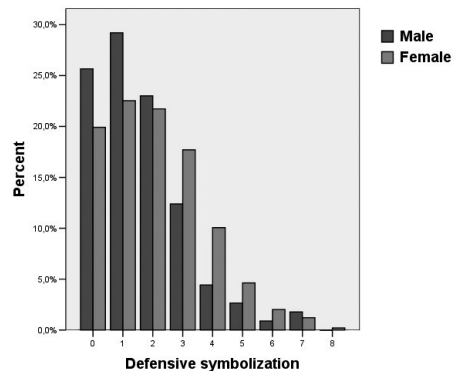
Figure 9.

6.4.2. The investigation of the three content analysis categories by their subtypes

The following subtypes have been investigated in the three categories:

a) Emotional subtype: aggression, fame, esxpressive behaviour, positive emotions, love, sadness, anxiety.

b) The subtype of defensive symbols: diffusion, chaos, passivity, voyage, accidental movement.
c) The subtype of regressive thinking: crossing, timelessness, unknown, concrete, narcissism, changes of consciousness.

Results

a) There is a significant difference between men and women in the aspects of sadness and anxiety. Women use more words that belong to sadness and anxiety in their answers (p=0,001, Z= -3,323; p<0,000, Z=-4,080) *(Figure 10.)*

We applied the Mann-Whitney U test.
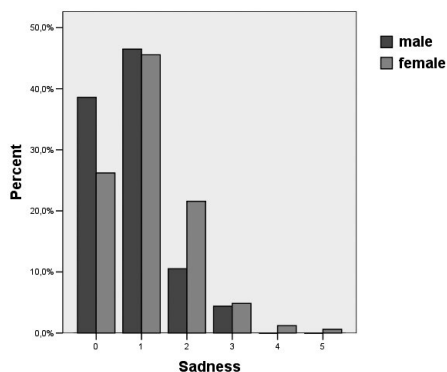
Figure 10.
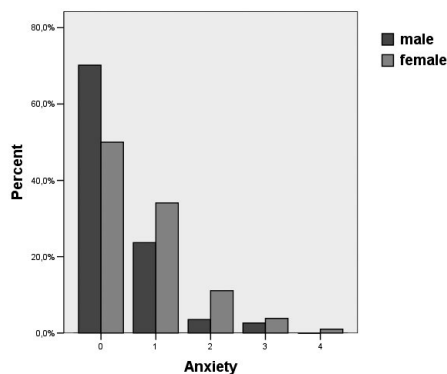
Figure 11.

A significant difference in the chaos aspect of the defensive symbols is observable between men and women. Women use more words that can be associated with chaos. (p=0,022, Z=-2,295) *(Figure 12.)*

The Mann-Whitney U test was applied.
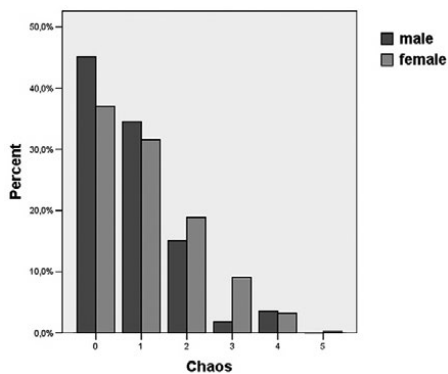
Figure 12.

b) There were no significant differences in the aspects of regressive thinking.

6.4.3. Aspects of time and gender in the cognitive and emotional reactions

We observed answers to "What do you know about the red sludge disaster?" and "What emotions have you got in connection with the disaster?" We wanted to learn about the willingness of the interviewees, and how their attitudes change over time.

The Mann-Whitney U test was applied.

We considered the answers to the above two open questions as indicators of willingness to answer.

a) The two categories showed similar progression in time: the two peaks of the curve are around Day 11 and Days 17 and 18. *(Figures 13. and 14.)*
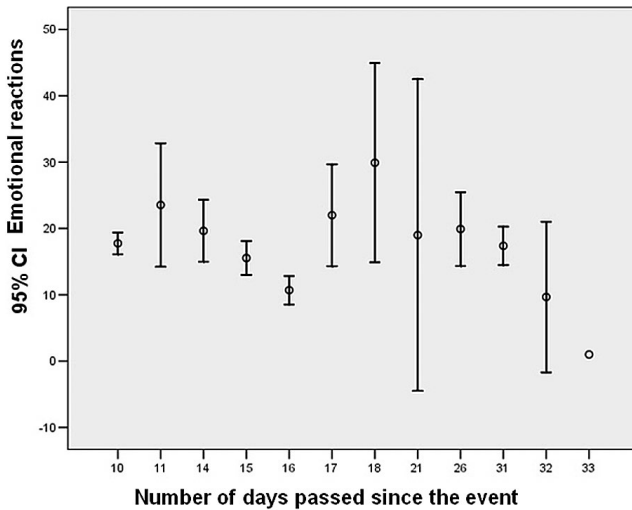
Figure 13.
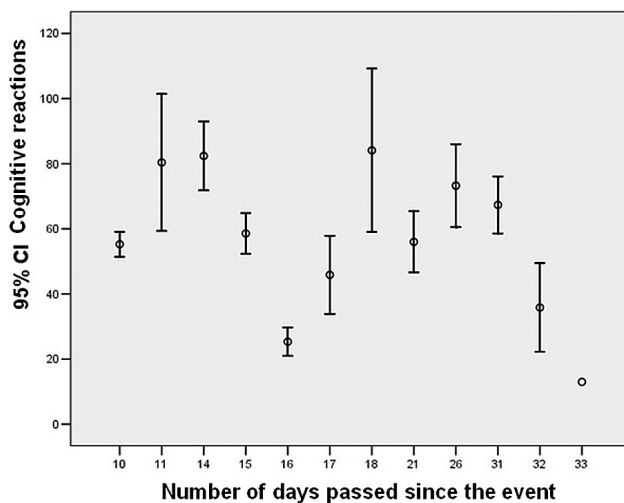
Figure 14.

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Cognitive and emotional aspects were contrasted by gender, and significant differences were found between the answers of the different sexes. Women used more words than men in both answers (p<0,000, Z=-3,904; p=0,026, Z=2,222).

The Kruskal-Wallis test was applied.

7. CONCLUSIONS

We concluded by confronting our results with our hypotheses.

7.1 The effect of distances

Our hypothesis concerning the inverse proportion between the geographical distance and the communication relating to the disaster and the frequency of thinking about it has been approved. The strongest marked difference has been registered between the closest and the farthest scenes of the survey regarding the frequency of exchange about the disaster with one person or in a company. The closer to the scene of the disaster an interviewee lived the more motivated he/she was to engage in an exchange or to think about the disaster.

7.2 Communication and thinking about the disaster

The fact that the communication about the disaster started decreasing after two weeks met our expectations drawn from the conclusions regarding disaster time dynamics in the international literature. What surprised us was the fact that even after four weeks interest in the disaster did not remarkably decrease. It did not fall below the level of the 10th day, sometimes it even increased. Interest in the trauma did not decrease within one month in this research. It seems the stage of inhibition, which is preceded by a sudden fall of interest, came about later in this case. In the inhibition stage, contrary to the previous stage, communication about the disaster is intentionally avoided. Our results indicate that the processing of this tragedy may have happened more slowly in our research population.

7.3 The dynamics of time in the on-line media

Interestingly, interviewees' attention to all contents of the media had a different pattern in time than the lap of national occurances of the written and visual contents in the on-line media. The individual daily averages of interest sometimes even exceeded the values of those of four weeks earlier.

The national on-line representation of the event was constantly decreasing, and this pattern of the dynamics of time seems to fall in line with the results of the research on the processing of traumatic events.

7.4 Gender differences in cognitive and emotional reactions

Women's emotional reactions exceeded men's quantitatively, and (the) content analysis indicated the overpowering presence of a defensive symbolism. Women used more words relating to sadness, anxiety, and chaos in their cognitive and emotional narratives about

traumatic events. This indicates that women, in their reactions to traumatic events, show more sensitivity to negative information, their narratives are fraught with negative emotions. Women possibly have an enhanced need for support, and in the emergency stage of the coping process this quality surfaces significantly.

8. DISCUSSION, PERSPECTIVES

In this study our sample – the majority of which was university students, mainly women – indicates a longer stage of emergency in their communication reactions and needs.

The members of this sample might have been more sensitive to the news of the red sludge disaster, which explains the intensity of their communication about the traumatic event even a month afterwards. The intensity of individual interest in the sample did not decrease markedly in the first month.

The intense, long lasting emotional reactions caused by a traumatic event of outstanding importance associated with national identity must have been of relevance for the members of our sample. However, interviewees were not directly affected by the event, they did not become victims. Nevertheless, reaction time patterns indicate a relatively long-term involvement.

The event of collective trauma is intertwined by larger quantities of negative feelings in women's reports. They probably need larger social support to their coping strategies, too.

In processing collective traumatic events the media, on the one hand, provides information, helps maintaining public interest and influences public communication about the event. On the other hand, media news help in searching and providing meaning, offer social narratives, thus they help the community to process the tragedy. Contents might represent the actual stage of the communal processing of the event.

We found a constant communication about the disaster more stable and longer lasting than the patterns of individual communication, not waning even one month after the event. The contents of the two types of on-line media – verbal and visual – showed a faster decrease in time. The segments of the media we observed were considered representative on national level, too. The constant and stable interest registered on the level of the individual – our results suggest – is not a consequence of quantitative media representation. The nature of the trauma, the seriousness of the case, the question of responsibility, the difficulties of rescue operations and mental rehabilitation might all have become factors of this issue. Physical distance has also played a part overwriting the globalizing effect of the news processing potential of the media. The red sludge disaster received considerable covering in the international media, too, but its international discussion and presentation was beyond the scope of the present research.

A continuation of the present research is a repeated survey after one year, which would deal with the characteristics of the so-called adaptation stage. This stage – which has been rarely studied – is usually characterized by a lack of inhibition and by the return of less extreme and more balanced emotional reactions concerning the disaster. Our plan is to study the cognitive knowledge about the event a year before, as well as the remapping of the actual

emotional reactions of the members of the present sample and those of others'. The present research is to be extended in a way that the type of the media through which the latest pieces of information about the disaster are conveyed to the interviewee would be included. Our research should also include other internationally renowned disasters, too. A structured questionnaire based on the results of the present study which would focus on the mapping of emotional representations would be developed and applied. The same questionnaire is planned to be applied to a sample of high-school students and adults, whereas the present study is using a sample of mainly university students.

We understand our survey was also an act of intervention into processing and coping strategies. In Debrecen and Nyíregyháza sampling was continuous, which might have influenced the attention of interviewees as they were aware of being surveyed. The written answers to the two open questions about participants' knowledge and emotional reactions offered them a kind of emotional writing, which, in itself, is an important way of processing traumatic events. We also plan to apply emotional writing among the victims of the red sludge disaster to help coping with difficulties and to reduce psychological and somatic consequences.

Our survey covers the first month of the collective processing of the disaster.

The question when a significant traumatic event with full-scale media publicity becomes part of the national memory needs further consideration. Our results facilitate further research questions and directions in the future. A relevant area might be to observe the characteristics of national, generational, political, geographical, and other environmental factors that affect the coping management of the community.

The results of our research may add to a better understanding of the nature of processing traumatic events in the community; they may serve as signposts to the implementation of psychological intervention; and they may as well help to understand the complex nature of media effects.

A year after of the tragedy two memorials were dedicated to the victims of the disaster in Kolontár and Devecser. Both settlements had been affected by the disaster, and their inhabitants suffered the immediate consequences of the devastation. Speakers of the first anniversary commemorated the tragedy by recalling the process of the common elaboration on the collective tragic event. Hungarian society has made unprecedented efforts at different levels, from the volunteers for the redevelopment of the environment to the organizational and managerial efforts of the local and central government.

We have intended to follow the cognitive and emotional dynamics of the communication concerning the disaster in our sample in the first month of a supposedly long process at the end of which a collective traumatic event is becoming part of the national memory.

Public remembrance of the first anniversary seems to support the feasibility of the red sludge disaster becoming a site – both physically and spiritually – of the national memory. A further survey is planned to be carried out on the different representations of these memorials for the purpose of a better understanding of the complexity of the collective elaboration of the red sludge disaster.

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KNOWLEDGE SPACES AND HISTORICAL KNOWLEDGE IN PRACTICE

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ABSTRACT

One of the methods of historical knowledge assessment is the application of knowledge space theory. One of its most important elements is the construction of knowledge structure. This presupposes a prerequisite relation system between knowledge items, which can mostly be proved in a „logical way" in the case of exact sciences, however we cannot disregard the empirical justification of these relations in the case of history. The present study puts the aforementioned as its aim in one topic of Hungarian history, namely the life of Lajos Kossuth. The profundity of the questions equals the knowledge level expected at school-leaving exams. We made a questionnaire, which was filled in by 169 high-school and university students. We selected two groups of its questions, which can be related to more restricted topics. We examined the relations between them in each groups that we supposed to exist and based on this, we set up two prerequisite relation models.

Keywords: knowledge space, competence-performance based approach, historical knowledge

1. INTRODUCTION

The main motivation of our present study is the research of Hungarian cultural memory, and within this our long-term goal is acquiring knowledge on and comparing collective knowledge states in different age groups, as well as describing the structure and history of Hungarian sites of memory. The theoretical background of our study is offered by knowledge space theory (Doignon és Falmagne, 1999), which promises the following advantages for teachers in the exact definition of historical knowledge or memory related to a person or a group, as opposed to the traditional diagnostic and formative assessment of long standing in measuring students' knowledge level (Katona and Sallai, 2002): a) the assessment process is economical concerning the questions asked, and it is adaptive similar to oral assessment; b) it gives exact information on the individual's knowledge state, it does not regard providing a number (e.g. percentage or grade) enough; c) it also ensures the determination of knowledge structure representative of the group; d) it makes possible the comparability of individuals' or groups' knowledge states; and last e) the assessment is possible by means of a computer.

As a first step to achieve our goals, we tried to define the so-called surmise (or precedence relations or prerequisite relatin) required by knowledge space theory, and we presented the basic steps towards the procedure of computer-based assessment (Abari and Máth, 2010). In the present study, we conduct an empirical analysis of knowledge space theory – so far mostly used in mathematics and natural sciences – within the domain of history. The topic chosen is „Lajos Kossuth's walk of life", which is an inevitable site for the research of Hungarian memory.

Therefore, our study examines the question of how applicable knowledge space theory is in the assessment of the knowledge on history. First, we present the outlines of competence-based knowledge space theory, then we provide the description of the surmise relation we defined (the so-called depth relation). We also present the worksheet on history we prepared, whose response patterns based on the submissions of 169 students are compared to the theoretical model based on the worksheet questions. We outline the indexes on the goodness of fit regarding the theoretical models and the data, which show the degree of applicability of knowledge space theory.

2. COMPETENCE-BASED KNOWLEDGE SPACE THEORY

Knowledge space theory (KST) was formulated by Doignon and Falmagne with the application of the concepts of lattice theory in mathematics (Doignon and Falmagne, 1999). Their primary goal was to develop a formal system of tools which made possible the assessment of an individual's knowledge on a given domain in an adaptive way, with the help of a computer. A fundamental element of knowledge space theory is the so-called *precedence relation*, which sets up relations between questions (or problems, items) related to a given domain.

Example 1. Let our given domain be „Lajos Kossuth's walk of life". Let us suppose that the domain includes the following 3 questions only (the question codes are given in brackets, which will be presented consistently in what follows as well):

a) Is the concept of "Redemption" relavant in this domain? (SZ1_K4_BB)
b) Is the concept of "Serfdom" relavant in this domain? (SZ1_K5_P)
c) What was the meaning of "Redemption" mean? (SZ2_K6)

In this case, the domain is the set of problems $Q=\{a, b, c\}$. Formally, the surmise or precedence relation means the specification of a binary relation on set Q (its notation is: $\leq$). The precedence relation between problems a and b is noted as $(a, b) \in : \leq$, or the more readable $a: \leq b$ form is used. The interpretation of $a: \leq b$ is the following:

if a student succeeds solving problem „b", she or he will also be able to solve problem „a".

The following definition equals the above:

if a student has failed to solve problem „a", she or he will also fail problem „b".

It is evident that the following precedence relations hold between the 3 problems mentioned above: $a: \leq c$, $b: \leq c$. The relation $a: \leq c$ holds, as knowing "what Redemption is" (*c*), involves knowing „the relatedness of Redemption to the domain" (*a*), to put it in a different way, if we do not know „the relatedness of Redemption to the domain" (*a*), we cannot properly answer the question of „what Redemption is" (*c*) either. Similarly, $b: \leq c$ also holds, as the concept of Redemption requires the knowledge of Serfdom to be related to the domain. (Further detailed explanation on precedence relations can be found in chapter 4.2.) Let us note that in interpreting precedence relations, we may exchange the expression „succeeds solving a problem" to the expression with equal meaning „knows the answer", and by using the term „*at least as difficult*", we may even reword the interpretation of the relation. The precedence relation between problems a and b holds ($a: \leq b$), if:

problem „b" is at least as difficult as problem „a".

The precedence relation of Example 1 is well representable by the so-called Hasse diagram (Diagram 1), which presents problems as points, and the precedence relations between them as ascending edges. (The exact definition of Hasse diagram can be found in Appendix 1.) As we do not direct the edges in our diagrams, we fix it that a directed edge runs from the lower point to the upper point in all cases. In line with this, a question at a lower level is precedence to all questions at higher levels which can be reached along the directed edges taking the lower-level question as the starting point.
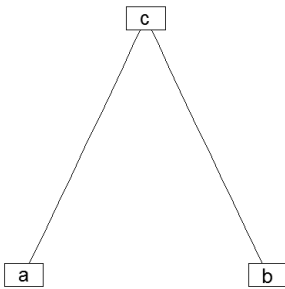
Diagram 1.
The Hasse diagram of the 3 problems in *Example 1.*
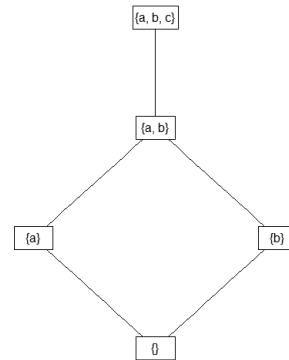
Diagram 2.
The Hasse diagram of the knowledge structure based on *Example 1.*

The result of the assessment process applying knowledge space theory is a so-called *knowledge state*, which comprises the problems the individual can answer correctly. Let *K* be the notation of a possible knowledge state. It is obvious that $K \subseteq Q$, that is, the given knowledge state is a subset of the problems. The possible knowledge states based on the precedence relations defined in the given domain, which are expected during the assessment procedure can easily be defined. Diagram 2 illustrates the possible knowledge states of Example 1 in a Hasse diagram. It can be noticed that set $\{a, c\} \subseteq Q$ is not present in Diagram 2, which is not by coincidence, as a knowledge state of this kind cannot occur based on the given precedence relations. That is, the correct solution of problem *c* results in the correct solution of problem *b*, so this in reality is knowledge state $\{a, b, c\}$, which is part of Diagram 2. This important characteristic feature, namely that the number of possible knowledge states is less than the number of subsets of *Q* is very useful in practical assessment. Taking into consideration the „restrictive" effect of all the precedence relations, we may call the set of possible knowledge states *knowledge structure*, and note it by $\mathcal{K}$. *Knowledge space* means pair $(Q, \mathcal{K})$, if $\mathcal{K}$ is closed under finite union.

In the analysis of historical memory sites, or even in school assessment when we determine an individual's knowledge state in a given domain, it is not certain that we expect the set of correctly answered questions as a result, but the hidden, cognitive, latent level is more important. Knowledge space theory basically focuses on the performance that can be observed during problem solution. One of its most successful extended branches that involves cognitive, latent structures as well is Competence Performance Approach (CPA), which was proposed by Klaus Korossy (Korossy, 1999). Korossy renamed knowledge space $(Q, \mathcal{K})$ known so far and which was based on problems as performance space and noted it (A, P), which comprises set *A* of problems and a performance structure *P* defined by the precedence relation between problems of set *A*. Latent structures explicitly appear in Korossy's model, as he also defines an (E, C) competence space, which is completely identical in structure with the already known $(Q, \mathcal{K})$ knowledge space. Through competence space (E, C), a set *E* of

abstract cognitive abilities relevant for the domain was introduced, and its subsets were called competence states. These are, however, not directly observable, but are definable through the analysis of problems representing the domain. Competence structure C is determined by precedence relations defined on set E of elementary competences. The two constructions, namely performance space and competence space are formally identical (both have the already introduced concept of knowledge space (Q, K) in their background), the only difference lies in their interpretation. Worded simply, it can be said that competence space has knowledge items that belong to the domain, whereas problem space has the questions that belong to the domain in its background.

Korossy links performance space and competence space with the so-called interpretation function: he assigns to each problem $a \in A$ the set of competence states in C, whose every element (competence state) makes it possible to solve problem a. After the provision of the interpretation function, the performance states are simply „readable" from the model: a set $Z \subseteq A$ of problems can be considered a performance state, if there exists a competence state $c \in C$ that Z contains exactly the problems which are solvable in c. Thus, the following need to be determined in Korossy's model: 1) set A of problems; 2) set E of elementary competences through the analysis of problems, 3) the precedence relations between elementary competences and the related competence structure C; 4) an interpretation function for linking performance space and competence space. Determining the performance structure which is the starting point of the adaptive assessment procedure is done automatically.

Competence based knowledge spaces have only been outlined in the present chapter. The detailed description of knowledge space theory can be found in two books by the theory's creators (Doignon and Falmagne, 1999, 2010), and it is also possible to have access to the briefer summaries of the topic in Hungarian (Tóth, 2005, Abari and Máth, 2010). More details on the competence-based extension can be found in Korossy (1999), and in Abari and Máth (2010) in Hungarian.

3. WORKSHEET ON HISTORY

According to what has been proposed in the above chapter, the determination of precedence relations between elementary competences is of fundamental importance in assessment procedures based on competence-based knowledge space. Therefore, it is our significant objective to get hold of knowledge expected at the school leaving exam with questions that are constructed along a certain hierarchy. By using the so-called *depth relations* (Abari and Máth, 2010), we distinguished four levels in the hierarchy, with four different questions:

Level 1: Are certain things (individuals, events, places, concepts, etc.) relevant from the point of view of the given domain?

Level 2: The meaning of the things mentioned at Level 1 are asked about, and fundamental things concerning them.

Level 3: The correlation between things mentioned at Level 2 are asked about, and correlations that concern the things mentioned at previous levels.

Level 4: We ask questions concerning deeper correlations related to the things mentioned at the previous three levels, where the alternatives proposed are more complicated and contain several sentences.

It is a fundamental question how depth relations operate in practice.

In order to analyse precedence relations, we made a worksheet with the domain of „Lajos Kossuth's walk of life". We divided the questions of the worksheet into four stages, based on their difficulty, and we paid attention to the depth relation. We asked questions about the same knowledge several times, in several forms, as it is exactly what the depth relation requires. Thus, „easy" questions were posed first, then the ones requiring deeper and deeper knowledge. We tried to achieve to have a correspondence between the levels of the depth relation and the stages.

The grouping of exercises by stages and their form is presented in Table 1. We deemed it important to avoid human intermediation in the evaluation of questions, as this is the only way to achieve the computer-based assessment procedure that is fast enough, and therefore can be widely used. Thus, all the questions are closed-ended, yes or no and multiple choice questions, with ample response alternatives, whose number is enough to achieve that those who bet should not be able to find the right answer very easily, but it should not be too difficult either to find possible and believable answers (Katona and Sallai, 2002).

Table 1. Grouping of the questions of the history worksheet

Stage	Number of Questions Total: 181	Exercise form	Correct/total number of answers
1.	135 questions (in 5 subdomains: places, people, documents, events, groups)	Yes or no	Different in the 5 subdomains: 10/22; 21/39; 10/20; 13/34; 9/20
2.	24	Multiple choice	1/4
3.	18	Multiple choice	1/4
4.	4	Multiple choice	1/4

The worksheets were filled in by 183 individuals in 4 high schools and at a university in May 2011. The completion took place during regular classes, with the supervision of the teachers of history, who had been previously provided with a written guide to assist them. Students had 20-24 minutes to fill in the forms, which meant 5-6 minutes on each stage. It was observed that many overstepped the time limit, though not significantly, but they needed approximately 30 minutes to fill in the forms with no rush. The completion of the worksheet took place stage by stage, as first they answered questions of stage 1, then they turned to the questions of stage 2, but they could no longer modify their answers at stage 1, and so on, the questions of the previous stages were no longer accessible. This was an important criterion in the completion process with questions gradually becoming more difficult by every stage.

When analysing the data, we omitted the data of those who did not respond to more than two questions, thus of the starting data sample we omitted the data of 14 students. This way, the database used for data analysis contains responses by 169 individuals. The sample

comprises responses by 138 high-school students and 31 university students. Table 2 shows information on respondents' mean age, their gender distribution, as well as their attitude towards history.

Table 2. Some statistical data on respondents.

	Number	Mean Age (year)	Sex*		Attitude towards History**			
			Male	Female	1	2	3	4
high school student	138	17.42	34%	64%	19%	51%	27%	3%
student	31	21.19	16%	84%	10%	35%	48%	6%
Total	**169**	**18.11**	**31%**	**68%**	**17%**	**49%**	**31%**	**4%**

* There were respondents who did not indicate their sex
** 1 – I do not like it; 2 – It is OK; 3 – I like it; 4 – It is my favourite subject

When selecting the questions of the worksheet, we tried to cover the material on Kossuth in Miklós Száray's high-school history book (Száray, 2009) as much as possible. In compiling the list of relevant people and places, we also used the essay by Z. Király (Király, 2010), which gives a review on the people and places occurring most often in history books used in secondary schools. The wording and checking of the questionnaire were assisted by Ferenc Velkey, associate professor of the Institute of History.

4. DETERMINING THE PERFORMANCE STRUCTURE

One of the most important objectives of our present study is to examine how much and in what way knowledge space theory can be applied in mapping historical knowledge. The basis of the adaptive assessment procedure is performance structure (that is, the traditional knowledge space), and we show an example to define this in the present chapter. First, we present the application of the depth relation with the so-called component analysis method, which leads to a set of elementary competences and competence states, and indirectly it results in performance structure. Following this, we turn to the statistical analysis of connections between questions based on logical relations expected by experts. We selected two groups of questions, which can be related to more restricted topics. We examine the connections between them in each groups that we supposed to exist and based on this, we set up two prerequisite relation models.

4.1. Component analysis
The component-based establishment of surmise relations was introduced by Albert and Held (1999). With the analysis of problems of a given Q domain, we break up the problems into components, and create a set of components, *Comp* of them. It is an important condition that some form of order (quasi order, linear order) should prevail between elements of *Comp*. As in this case, the order between components provides the hierarchy of problems made up of components. Appendix 1 offers more information on the different cases of order.

Let us apply the method of component analysis to elementary competences. (In this case, the adjective „elementary" becomes less important, as we try to analyse and break up competences.) The depth relation between elementary competences is extremely appropriate for this purpose.

Example 2. Let us suppose that elementary competences related to domain Q can be described by a single attribute, their depth level. Let us note it by Sz, and on the basis of the above, it is obvious that $Sz=\{1, 2, 3, 4\}$, where numbers symbolize depth levels. There is linear order between the 4 levels (Diagram 3). If the set of components was identical with set Sz, there would exist only 5 elementary competences, in connection with the precedence relation illustrated by Diagram 4.

Diagram 3.
The Hasse diagram of the linear order between
the depth levels, based on *Example 2.*

Diagram 4.
The set of elementary competences, if there is linear
order between the elements of the set of components
(based on *Example 2*).

Naturally, an elementary competence is not only characterised by its depth level, but also by what the knowledge level concerns. That is, what is it we know at level 1, level 2, etc. So we introduce set D of things, which contains the important concepts, individuals, groups, events, etc. of the given domain.

Example 3. Let the set of things in our domain be the following set: $D=\{Sz, e, o\}$, where the following abbreviation is used: **Sz**="István Széchenyi", **e**="Union of Interests", and **o**="Redemption". Let us consider the set of things its power set, and let us take away the empty set: $2^{D+}=2^{D}\backslash\varnothing=\{\{Sz\}, \{e\}, \{o\}, \{Sz,e\}, \{Sz,o\}, \{e,o\}, \{Sz,e,o\}\}$. Let us consider the inclusion relation over set 2^{D+}, which is partial order and so quasi order as well.

On the basis of the above, our elementary competences have two attributes:
• Sz: the level of depth relation, which is ordered linearly.
• 2^{D+}: the power set of things without the empty set, which is partially ordered with the inclusion relation.

Albert and Held (1999) showed how knowledge space can be established in the case of two (or more) attributes. This method can also be used in the case of elementary competences. Let us form the Cartesian product of the two sets, which results in the set of elementary

competences: $E=Sz\times2^{D+}=\{(1,\{Sz\}),\ (1,\{e\}),\ …,\ (4,\{Sz,e,o\})\}$. Set E of elementary competences has 28 elements. The prerequisite relation between them comes about on the basis of the rule of coordinatewise order and along the orderliness of set Sz and 2^{D+}. In general, if $(Comp_1, R_1)$ and $(Comp_2, R_2)$ are partially ordered component sets, then a b holds (that is, a prerequisites for b), if $a, b \in Comp_1\times Comp_2$ and $a = (a_1, a_2)$, $b = (b_1, b_2)$ holds, $a_1 R_1 b_1$ and $a_2 R_2 b_2$ are fulfilled. In Example 3, $Comp_1=Sz$ and $Comp_2=2^{D+}$, furthermore, R_1 is the linear order between levels, R_2 is the inclusion relation between elements of 2^{D+}. Diagram 5 shows set E of elementary competences comprising 28 members, and the precedence relations defined according to the rule of coordinatewise order. The labels of nodes denote elementary competences in a simplified way. Label „1-Sz", for example, denotes elementary competence $(1, \{Sz\})$, while „3-Sze" denotes element $(3,\{Sz,e\})$ in E. The meaning of „1-Sz" is: "s/he knows that István Széchenyi belongs to the domain", whereas the meaning of "3-Sze" is: „s/he is familiar with the relation between István Széchenyi and the Union of interests".
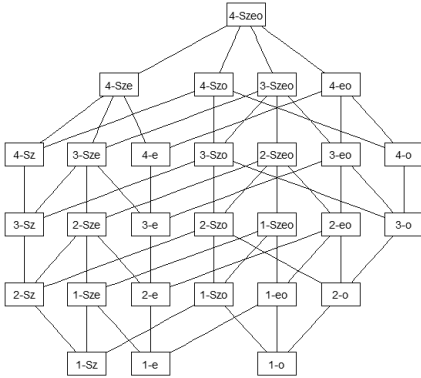
Diagram 5.
The Hasse diagram of elementary competences.
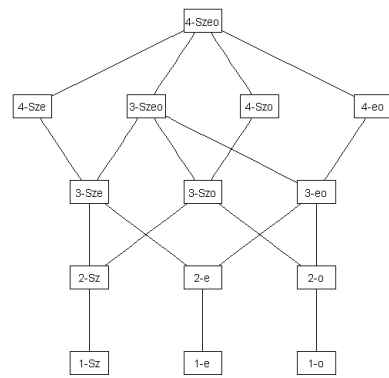
Diagram 6.
The Hasse diagram of the restricted set of elementary competences.

The two elementary competence attributes defined above in the domain of history reflect a relatively simple knowledge structure. The attribute of levels (Sz) shows the depth of knowledge, which can be extended to further levels at will, or restricted in certain cases. The power set of things (2^{D+}) grasps the subject of knowledge, which can be one-element sets, for example {István Széchenyi}, or multi-element sets {István Széchenyi, Union of interests}. The definition of set D of things makes the use of this tool very free, and it is only up to us what we include or leave out of the system. These are typically the one-element sets of 2^{D+} that are important at the first two levels concerning elementary competences: the given thing belongs to the subject (level 1), or the person knows its meaning (level 2). At higher levels, the multi-element sets of 2^{D+} play an important role: the person knows the relation between István Széchenyi and the Union of interests. According to the above, we may restrict set E of elementary competences, we may omit the elementary competences of the first two levels that refer to multi-element things (e.g.: „1-eo" and „1-Sze") and the ones

of the higher two levels that refer to one-element things (e.g.: „3-e" and „3-o"). Diagram 6 shows the restricted set *E* of elementary competences, which thus contains only 14 elementary competences.

In order to create performance space, we need to assign to our questions the competence states where the given problem can be solved successfully (interpretation function). Let us note that the original competence structure *C* (based on Diagram 5) includes 2603 competence states, while the restricted one (based on Diagram 6) only 74. The number of assignments can be further decreased in practice with the use of the so-called base, which has now 14 elements. Details on determining performance space can be found in Korossy, 1999, and Abari and Máth, 2010 also present it through an example.

Let us note that the implementation of the above procedure runs into difficulties when the element number of the set of attributes is increased. If the set of things is extended by one single element (e.g.: the concept of Serfdom), the restricted set of competence states will have 30 elements, and the competence space will have 3454 elements. As the running time of our experiments to determine the base for creating performance space can be measured in days (*R* program with *kst* package, 3.1 GHz CPU, Windows 7) – with a personal computer that can be considered up-to-date today –, we shall not consider the further examination of the very promising method based on component analysis in our present study.

4.2. Statistical analysis of the questionnaire survey

As we mentioned in chapter 3, we had a questionnaire of four sections with 181 items altogether – 135 binary items in the first section, 24, 18 and 4 multiple choice items with four alternatives in the remaining sections. The answers of 169 persons were coded into a binary data matrix of 169 rows and 181 columns. Each row is a so called response *pattern* of zeros and ones, where zero means the wrong answer, and one means the right one.

In this section we examine some pairs of questions, between which an expert would find prerequisite relation (see chapter 2.) and we investigate whether our data confirm this relation. More precisely, in case of a pair of questions, we examine what is the consequence of the right answer to the first question for the correctness of the second answer. The knowledge space theory assumes that the correct answer to the first question is necessary for the right answer to the second one, that is, the wrong answer to the first question implies the wrong answer to the second one.

For example, if the first question is related to "Széchenyi", while the second one is about the "essence of the Kossuth – Széchenyi debate", we may assume that those who don't mark Széchenyi, as a relevant person, know nothing about the debate.

It is possible at the same time, that if the topic is Kossuth, Széchenyi doesn't cross one's mind, but the appropriate question dredges the right answer. In this case the strength of relation between the two questions will decrease, the wrong answer to the first question only decrease the chance of a right answer to the second question, but it doesn't exclude it.

Another factor, which may have an opposite impact is that students usually read more pages or a whole chapter at once and this establishes relations between the answers to questions close to each other in the book but distant from each other logically.

Consequently, when examining a statistically significant relation between two items, it is not easy to decide whether there is a prerequisite relation between them or not. The aim of this paper – inter alia – is just to answer this question.

To do this we selected two sets of questions, each of them related to the same topic, and on the basis of their logical connections we set up two systems of relations, which can be tested within the knowledge space theory.

4.2.1 Examining question pairs of level 1 and 2

When examining the pairs of questions, we assumed the strongest prerequisite relations between the questions of level 1 and 2. It means that if someone doesn't mark a concept on level 1, he or she doesn't know the meaning of this concept and won't be able to answer any question of level 2 based on or connected with the concept. We also assumed, slightly pushing the boundaries of this hypothesis, that a mistake on level 1 results in guessing in case of other questions related to that concept.

In Table 3 we listed a few pairs of questions from level 1 and 2 with the most important descriptive values of their relations in order to demonstrate the difficulties in applicability of knowledge spaces. Table 3 summarises the following information:

Column 1: the first question
Column 2: proportion of correct answers to the first question
Column 3: the second question
Column 4: significance value, testing independence between the answers to the pair of questions
Column 5: proportion of correct answers to the second question in case of wrong and right answers to the first question, respectively.

In the second raw it can be seen that 26% of those who failed to mark "Union of Interests" could define this concept, while among the others this proportion was 49%. The independence of the answers to the pair of questions can be rejected because of the small significance. 26% is close to the proportion of success in case of guessing.

For those who are guessing, the possibility that their mean score exceeds the limit of , is 0.05, where n is the number of those who failed to mark the appropriate first level concept. This value is between 32 and 35%, depending on n occurring in our sample.

We may assume that for those who don't mark the concept in the first column the proportion of correct answers will be fewer than 35% in case of the covering question. We have multiple choice questions with 4 alternatives, and it is difficult to achieve that for a student who is uninformed about the given question all the alternatives seem equally possible. This is a likely explanation why the proportion of the right answers may exceed the level of 35%. If this proportion is much higher for the second (covering) question than for the first (prerequisite) question, it doesn't fit into the logic of knowledge space theory. This is the case for the last four questions. Let we see the alternatives and their frequencies.

Table 3. Testing independence of question pairs

1 level: Is that concept relevant?	Prop. of right answers	Higher level question	Sign.	Prop. of right answers	
National Defense Committee	45%	Who was the head of the National Defense Committee? (SZ2_K15)	0.045	23%	37%
Union of Interests	37%	What was the Union of Interests in the 1840s? (SZ2_K5)	0.003	26%	49%
serfdom	32%	What was the Union of Interests in the 1840s? (SZ2_K5)	0.001	26%	54%
National Defense Committee	45%	What was the meaning of National Defense Committee? (SZ2_K14)	0.080	33%	46%
Dietal Reports	70%	What was the meaning of Dietal Reports? (SZ2_K3)	0.007	35%	58%
Cassandra-letter	34%	What was the meaning of Cassandra-letter ? (SZ2_K21)	0.001	36%	63%
Széchenyi	78%	What was the essence of the Kossuth-Széchenyi debate? (SZ3_K7)	<0.001	36%	70%
National Protectionist Association	47%	What was the National Protectionist Association? (SZ2_K2)	<0.001	37%	72%
National Defense Committee	45%	How did National Defense Committee take over the power? (SZ2_K17)	0.011	41%	60%
Opposition Circle	40%	What was the meaning of Opposition Circle? (SZ3_K7)	0.200	42%	52%
Redemption	32%	What was the meaning of Redemption? (SZ2_K6)	0.040	55%	74%
Serfdom	32%	What was the meaning of Redemption? (SZ2_K6)	0.002	50%	83%
Address to the Crown	49%	What was the Address to the Crown? (SZ2_K11)	0.380	66%	72%
Jelasics	25%	Who was Jelasics? (SZ2_K13)	0.490	79%	74%

What is the meaning of Redemption?
(A) *Exemption for the nobility from inheritance tax.*
(B) *The plot of land becomes the serfs' own property and they are also exempted from all the other services toward their landlords*
(C) *The serfs' right to choose their landowners*
(D) *The serfs moving into towns may free themselves from corvées (labour services) by paying redemption fee.*

Alternatives to Question SZ2_K6.

Table 4. Crosstabulation of questions SZ1_K4_BB and SZ2_K6

| | | What was the meaning of Redemption? (SZ2_K6) | | | | Total |
		A	B	C	D	
Redemption	not marked	21 18.6%	62 54.9%	6 5.3%	24 21.2%	113 100.0%
	marked	3 5.4%	40 71.4%	1 1.8%	12 21.4%	56 100.0%
Total		24 14.2%	102 60.4%	7 4.1%	36 21.3%	169 100.0%

In the case of question "What was the meaning of Redemption?" there was an alternative chosen by a few students only. Almost nobody thought that alternative (C) was a lifelike answer. In this case this wrong option could explain the fact that for even those who failed to mark the concept of Redemption the proportion of correct answer was about 55%. For the question about the relation of "Serfdom" (SZ1_K5_P) and "Redemption" the situation was the same. Here the problem was that half of the students who failed to mark "Serfdom" gave a correct answer to the second (covering) question.

Let we examine this problem for the penultimate pair of questions in *Table 3*.

What was the Address to the Crown?
(A) *The regulation of the Dieta's agenda*
(B) *Proposal for introducing protective tariffs*
(C) *It proposed that the Hungarian soldiers stationing in foreign countries should be sent home*
(D) <u>*It demanded obligatory redemption, burden sharing and independent Hungarian Government of the Emperor*</u>

Alternatives to Question SZ2_K11

Table 5. Crosstabulation of questions SZ1_K3_T and SZ2_K11

| | | What was the Address to the Crown? (SZ2_K11) | | | | Total |
		A	B	C	D	
Address to the Crown	not marked	3 3.4%	6 6.7%	21 23.6%	59 66.3%	89 100.0%
	marked	6 7.5%	4 5.0%	12 15.0%	58 72.5%	80 100.0%
Total		9 5.3%	10 5.9%	33 19.5%	117 69.2%	169 100.0%

From the alternatives to the question "What was the Address to the Crown?" almost nobody choose the first two regardless of their answer to the first question concerning the

relevance of "the Address to the Crown". So the "regulation of the Dieta's agenda" and the "introduction of protective tariffs" wasn't credible at all.

This is the last pair of questions in *Table 3.* SZ2_K13

Who was Jelasics?
(A) <u>*Imperial general of Croatian ancestry*</u>
(B) *Serbian rebel*
(C) *Croatian border guard colonel*
(D) *Slovenian colonel*

Alternatives to Question SZ1_K2_FF

Table 6. Crosstabulation of questions SZ1_K2_FF and SZ2_K13

		Who was Jelasics? (SZ2_K13)				Total
		A	B	C	D	
Jelacics	not marked	100 79.4%	9 7.1%	8 6.3%	9 7.1%	126 100.0%
	marked	32 74.4%	3 7.0%	8 18.6 %	0 .0%	43 100.0%
Total		132 78.1%	12 7.1%	16 9.5%	9 5.3%	169 100.0%

In the case of question „Who was Jelasics" we also had two alternatives that proved unbelievable, but the odd thing to note is that among those who marked Jelasics's name the proportion of the good answer is lower and the proportion of the third, wrong answer is higher. Perhaps the reason is that "General Jelasics" is a well-known name and only one alternative contained the title General. But, if someone marked Jelasics, he or she was likely to know Jelasics's nationality, which was a true piece of knowledge in the third alternative.

4.2.2. Examining pairs of questions of higher levels

Now let we see examples for connections between some higher level questions. Here we also can observe cases when that the prerequisite question proved to be more difficult than the covering one.

The concept of "Union of Interests" was familiar only to 35% of the students, but among these students the proportion of correct answers to the question "What was the opinion of Kossuth about the Union of Interests ?" was more than 50%.

What was the Union of Interests in the 1840s?
(A) Harmonizing the interests of Austria and Hungary
(B) *Harmonizing the interests of Hungarians and the other nationalities*
(C) *The concurrent respect of the noblemen's and the serfs' interests*
(D) *It was in the unified interests of the great powers not to let Hungary remain independent*

Alternatives to Question SZ2_K5

What was Kossuth's opinion about the Union of Interests?

(A) <u>*Hungary's independence cannot be achieved without this*</u>

(B) *This makes easier to achieve independence*

(C) *It is easier to achieve independence without this*

(D) *It increases the tension unnecessarily*

Alternatives to Question SZ3_K3

Table 7. Testing independence of question pairs

Prerequisite question	Prop. of write answers	Covering question	Sign.	Prop. of write answers	
What was the meaning of Redemption? (SZ2_K6)	60%	What was the Union of Interests in the 1840s? (SZ2_K5)	0.14	28%	39%
What was the Union of Interests in the 1840s? (SZ2_K5)	35%	What was the opinion of Kossuth about the Union of Interests ? (SZ3_K3)	0.01	50%	71%
What was the Union of Interests in the 1840s? (SZ2_K5)	35%	What is the connection between the Union of Interests and Redemption? (SZ3_K4)	0.01	18%	36%
What was the Union of Interests in the 1840s? (SZ2_K5)	35%	What was the essence of the Kossuth-Széchenyi debate? (SZ3_K7)	0.26	59%	68%
What is the connection between the Union of Interests and Redemption? (SZ3_K4)	24%	Which is the correct summary of the Kossuth-Széchenyi debate? (SZ4_K2)	0.09	30%	44%
What was the essence of the Kossuth-Széchenyi debate? (SZ3_K7)	62%	Which is the correct summary of the Kossuth-Széchenyi debate? (SZ4_K2)	0.46	30%	35%

We may presuppose that those who are not familiar with the concept of „Union of interests" also have no idea about Kossuth's opinion. The problem is that the last alternative, the statement "It increases the tension unnecessarily" did not proved to be credible therefore almost nobody choose it. It is a positive concept, which is not likely to increase the tension. The truth is that for a number of noblemen it did increase the tension but according to Kossuth this certainly was not unnecessary.

What was the essence of the Kossuth-Széchenyi debate?

(A) *How to time the claim for Hungary's independence?*

(B) *Is it possible to establish Hungarian industry without protective tariffs?*

(C) <u>*Is it advisable to speed it up the reform processes if this may lead to more severe conflicts between Austria and Hungary?*</u>

(D) *Is it possible to involve the serfs in the changes without risking the noblemen's rights?*

Alternatives to Question SZ3_K7

Table 8. Crosstabulation of questions SZ2_K6 and SZ4_K2

| | | | What was the essence of the Kossuth-Széchenyi debate? (SZ4_K2) | | | | Total |
			A	B	C	D	
What is the meaning of Redemption?	A		10 20.4%	1 2.0%	29 59.2%	9 18.4%	49 100.0%
	B		9 18.4%	6 12.2%	28 57.1 %	6 12.2%	49 100.0%
	C		2 3.4%	2 3.4%	40 69.0 %	14 24.1%	58 100.0%
	D		2 18.2%	1 9.1%	7 63.6 %	1 9.1%	11 100.0%
Total			23 13.8%	10 6.0%	104 62.3%	30 18.0%	169 100.0%

The knowledge about the „Union of interests" and the "Kossuth-Széchenyi debate" may be related. The last alternative to the second question was connected with the „Union of interests" but it was a wrong alternative.

From the cross tabulation of the answers we can see that apart from the right answer this wrong alternative was almost the only one that was selected, moreover –compared to the other alternatives– in a bigger proportion. This is another example for a special kind of mistakes, when a piece of knowledge may increase the chance of a wrong answer merely because that answer contains the familiar piece of knowledge.

At first glance, the last question pair request for the same information, but this it is not the case. Though both of them are concerned with the "Kossuth - Széchenyi debate", the alternatives and the complexity of the answers are quite different. In the first item the alternatives differ greatly, which makes relatively easy to choose the right one, while in the second one the alternatives are similar and much more detailed.

Which is the correct summary of the Kossuth-Széchenyi debate?

(A) *Széchenyi and Kossuth shared opinions on civil transformation and Hungary's autonomy but held divergent views about how to achieve these goals. Széchenyi was afraid of the quick growth of social contrasts and the conflict with the Habsburgs. Because of this Széchenyi openly attacked Kossuth, the editor-in-chief of the newspaper 'Pesti Hírlap' for his radical articles.*

(B) *Széchenyi and Kossuth shared opinions on civil transformation, but Széchenyi did not accept the idea of Hungary's autonomy, while Kossuth attached the greatest importance to it. In this sense Széchenyi was a 'bridge man' because he wanted to keep Hungary and Austria together by any means.*

(C) *Széchenyi was a wealthy aristocrat and Kossuth belonged to the lower nobility with no land, so they saw the question of the civil transformation very differently. Széchenyi hurried the emancipation of serfs because wealthy landowners could afford to hire wage labourers using machines. Kossuth took a more cautious approach because the lesser nobles lacking capital couldn't go without the serfs' work.*

(D) *Széchenyi was born into a family traditionally loyal to the Habsburg dynasty. He had close connections with the Court in Vienna and as an officer swore allegiance to the Emperor. For emotional reasons Széchenyi did not consider acceptable the open collision with Habsburgs but because of Kossuth political activity it seemed more and more inevitable for him. Although Lajos Kossuth considered Count Széchenyi "the greatest. Hungarian", he added that Széchenyi should not be the greatest Austrian at the same time.*

Alternatives to Question SZ4_K2

Examining the answers to this pair of questions we didn't find significant connection. The question of level 4 proved to be very difficult, the proportion of correct answers didn't exceed 35%. Though this fact was surprising for us, it doesn't contradict the knowledge space theory. We may also note that the answer to this question is significantly related to the one about the connection between the "Union of Interests" and "Redemption". Both of them differ from the most questions because they require some intelligence.

Summarizing the results of the analysis above, it can be said, that the connection between the questions proved to be significant in the great majority of the cases. This means that the correct answer to the prerequisite question significantly increased the possibility of correct answer to the covering question, and it points in the direction of applicability of the knowledge space theory. There are some cases, however, when either this was not true or the wrong answer to the prerequisite question was followed by a high proportion of good answers to the covering question. The latter may limit the applicability of the knowledge space theory.

We think that this problem is connected with the fact that when answering a multiple choice question students may not only guess but also rely on some other pieces of information and heuristics which are not related the goodness of the answer to the prerequisite question:
•   We presented examples for the fact that superficial knowledge increases the chance of choosing a familiar answer even if it is wrong.
•   It also occurred that the correct answers to two very similar questions were not related to each other because the wrong alternatives of the items covered different areas.

All this means that in case of multiple choice tests the questions and the correct alternatives by themselves do not provide enough information to define the connections between the answers, because the wrong alternatives may distort the assumed structure significantly.

4.2.3. The suggested performance structure: the theoretic model

In this chapter we show two possible performance structures, which consist of 10 and 11 questions. The first topic is concerned with the "Union of interests", its connection with "Kossuth", and the "Széchenyi-Kossuth debate", which occurs mainly in the wrong alternatives. The second topic covers "Kossuth's opinion about Conciliation", and his role played in the military defeat.

The questions of the first topic can be seen in Table 9. We defined a hierarchical model of prerequisite relations in order to test them within the framework of the knowledge space theory. The Hasse diagram of this hierarchy can be seen on Diagram 7. This is the first

theoretical model. The lines of this diagram are labelled with two values of percent. These are identical to those in the last two columns of Table 3 and 7. These are the proportions of good answers to the covering questions among those who gave wrong or good answers to its prerequisite question. The value in the square brackets of a question shows the overall proportion of good answers.

Table 9. The 11 questions of the first topic.

	The code of question	The question in the test
1.	SZ1_K2_P	Is István Széchenyi relevant in this domain?
2.	SZ1_K4_D	Is the „Union of interests" relevant in this domain?
3.	SZ1_K4_BB	Is the „ Redemption" relevant in this domain?
4.	SZ1_K5_P	Is the „ Serfdom" relevant in this domain?
5.	SZ2_K5	What was the Union of Interests in the 1840s?
6.	SZ2_K6	What was the meaning of „Redemption"?
7.	SZ3_K3	What was the opinion of Kossuth about the „Union of interests"?
8.	SZ3_K4	What is the connection between the Union of Interests and Redemption?
9.	SZ3_K6	How did the famous Széchenyi-Kossuth debate start?
10.	SZ3_K7	What was the essence of the Kossuth-Széchenyi debate?
11.	SZ4_K2	Which is the correct summary of the Kossuth-Széchenyi debate?
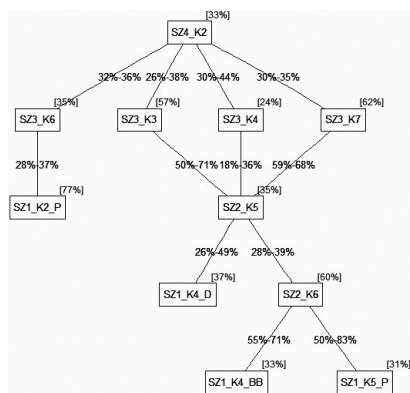
Diagram 7. The Hasse diagram of the first theoretical model representing 11 questions and their prerequisite relations

– The lines mean relations in which according to our hypothesis, the lower questions are the prerequisite of the upper ones. For example, in case of question SZ1_K4_BB ("Is the Redemption relevant?") and question SZ2_K6 ("What was the meaning of Redemption?") we assume that a correct answer to the first question is necessary to answer the second one. The summary of the previous model is he following.

–   Marking „Redemption" (SZ1_K4_BB) and marking „Serfdom" is necessary to answer the question „What was the meaning of Redemption?

–   Answering the question „What was the meaning of Redemption?" and marking the "Union of interests" necessary to answer the question "What was the Union of Interests in the 1840s?"

–   Answering the question „What was the meaning of Union of interests?" (SZ2_K5) is necessary to answer the following questions.
    • "What was the opinion of Kossuth from the Union of interests?" (SZ3_K3)
    • „What is the connection between the Union of Interests and Redemption?" (SZ3_K4)
    • "What was the essence of the Kossuth-Széchenyi debate?" (SZ3_K7).

–   Marking Széchenyi (SZ1_K2_P) is necessary to answer the question "How did the famous Széchenyi-Kossuth debate start?" (SZ3_K6).

–   To answer the questions SZ3_K3, SZ3_K4, SZ3_K6, SZ3_K7 explained above are necessary to answer the question „Which is the correct summary of the Kossuth-Széchenyi debate?"

Let us have an example for the meaning of the per cent values on Diagram 7. For the SZ1_K4_BB question, the 33% in the upper right corner means the overall proportion of correct answers. The 55% - 71% pair stands for the same in the case of SZ2_K6 in the groups of wrong and right answers, respectively. These values imply two things: question SZ1_K4_BB proved to be much more difficult than the question SZ2_K6 and the right answer to the question SZ1_K4_BB significantly increases the chance of good answer to the question SZ2_K6.

In order to verify this hierarchy in the framework of the knowledge space theory it should be true for the most pairs of question that: (a) Those who give a wrong answer to a prerequisite question do the same in the case of the covering one (that is the proportion of good answers shouldn't exceed 35%). (b) For the others the covering question is not easier, than the prerequisite question.

The questions of the second topic can be seen in *Table 10*.

The theoretic model 2 made of the above questions can be seen on Diagram 8. It is important to mention that in case of the last question (SZ4_K4) we subsequently decided to accept the second alternative too, because it is very close to the first one. It means that in this case for those who are guessing the chance of a good answer is not 25% but 50%

In connection with the previous topic's figure we explained the meaning of lines and values, so we don't repeat it again. That is why the analysis of the second model is significantly shorter.

One can see that relations of question pairs are consistent with the knowledge space theory. There is only one exception, the pair of (SZ1_K2_HH – "Is Görgey relevant ..." and SZ3_K15 – "Who was the person, against whom the other three …") . Independently from marking "Görgey" the proportion of those choosing him as a correct answer for the second question was almost 50%. This value is too high compared to the ideal value of 25% for those who missed to mark Görgey.

An other interesting feature of this question pair is that a correct answer to the prerequisite question doesn't increase the proportion of good answers to the covering question. The same

Table 10. The 10 questions of the second topic.

	The code of question	The question in the test
1.	SZ1_K2_F	Is „Ferenc Deák" relevant in this domain?
2.	SZ1_K2_P	Is „István Széchenyi" relevant in this domain?
3.	SZ1_K2_HH	Is „Artúr Görgey" relevant in this domain?
4.	SZ1_K3_B	Is „Casndra - letter" relevant in this domain?
5.	SZ1_K5_K	Is „Polish emigrants" relevant in this domain?
6.	SZ2_K21	What was the meaning of Cassandra – letter?
7.	SZ3_K15	Against whom did the other three persons come to an agreement during the Hungarian War of Independence?
8.	SZ3_K17	In the course of the fights against the Austrian – Russian army what was Kossuth's attitude like, which could be criticized subsequently?
9.	SZ3_K18	What was Kossuth's opinion about the „Union of interests"?
10.	SZ4_K4	Interpret the following statement told by Kossuth after the Hungarian War of Independence. "Poor of our country has been defeated not by the strength of our enemy, but by betrayal and villainy …"

occurs in the pairs (SZ3_K15 - SZ4_K4) and (SZ3_K17 - SZ4_K4). It is the case in the last two pairs despite the fact that all the questions are centred around the "Kossuth – Görgey conflict". It is noteworthy that the situation was similar in the case of the question pair (SZ3_K7 - SZ4_K2) centred around the „Kossuth – Széchenyi conflict".

All this doesn't contradict the knowledge space theory. It rather means that the questions of level 4 require, among other things, a competency that most of students don't pessess. This probably is the ability of understanding and comparing longer alternatives.
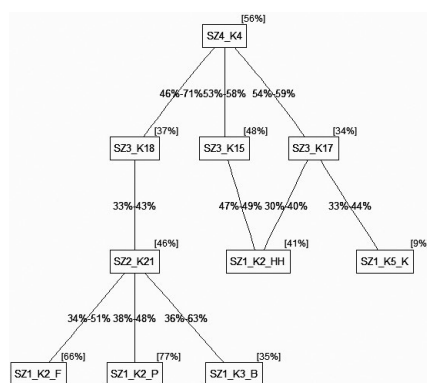

Diagram 8. The Hasse diagram of the second theoretical model representing 10 questions and their prerequisite relations

5. FITTING OF THE KNOWLEDGE SPACES TO OBSERVED DATA

It is an important task to examine the fitting of hypothetical knowledge structure and knowledge structure based on empirical data. So far, we have set up two models based on the theory of knowledge structure for the two groups of questions in our questionnaire, and now we turn to examine how these models fit the data from the questionnaires. The analysis of fitting can be considered our search for the best fitting knowledge structure to our data. When examining the degree of fitting, we need to take into consideration if lucky guesses or careless errors are included in the model or not. We have selected some coefficients in the present study which do not directly include the two above-mentioned distorting factors. Furthermore, the fitting tests applied do not offer significance values, only goodness indices based on the theory of knowledge space, where solely the values of perfect fitting mean the base for comparison. Therefore, we created simulated databases according to the theoretical models, which necessarily give a perfect reflection of the models mentioned, however, these simulations also include the possibility of lucky guesses and careless errors. We expect that the resulting data will not fit significantly better, and the goodness indices will be similar to the ones resulting from the data of the questionnaire. All this would prove that knowledge space theory is well applicable to the analysis of the data concerning the historical questionnaire, however, the limits of the multiple choice tests need to be taken into account.

5.1 Description of the simulation

Simulation helps us in imitating a real phenomenon, mostly with the help of a computer. In our case, this phenomenon is the completion of the worksheet by individuals. The result of the simulation will be the correct or incorrect answers given to the questions, that is either 1 or 0. As the element number of the original sample (number of individuals) was 169, we repeat the simulation 169 times. We conduct two types of simulation: the first one is based on *theoretical model 1*, and the second one on *theoretical model 2*.

The models used in the simulation have two kinds of parameters (in the case of a b: a covered by b, a – prerequisite question; b – covering question).

- p_0: how probable it is that the individual knows the answer for the covering question if s/he gave an incorrect answer to the prerequisite question. The value of this in the simulation is 0.35. This value – beyond the previously described theoretical consideration – can be considered typical in the sample.

- p_1: how probable it is that the individual knows the answer for the covering question if s/he gave a correct answer to the prerequisite question. The value of this in the simulation is 0.7. This is the upper limit of this type of probability in the sample.

Two basic cases can be differentiated in the relation between prerequisite and covering questions:

Case 1   one covering question is related to one prerequisite question
Case 2   one covering question is related to more prerequisite questions

It is enough to consider these basic cases during simulation, as this allows us to assign either 1 or 0 to all questions, that is, a correct or incorrect solution.

The steps of the simulation are the following:
1. We assign 0 or 1 to the leaf questions (without prerequisite question) of the Hasse diagram (Diagram 7 or 8) at a probability of 0.5.
2. If a covering question has only one prerequisite one (Case 1), then the covering question will take value 1 at a probability of p_0 if the prerequisite question is 0, or it will take value 1 at a probability of p_1 if the prerequisite question is 1.
3. If a covering question has only multiple prerequisite questions (Case 2), then the covering question will take value 1 at a probability of p_0 if there is of value 0 among the prerequisite questions, or it will take value 1 at a probability of p_1 if all the prerequisite question take value 1.

On the basis of the above simulation, we conducted a so-called *modified simulation* as well, which is closer to knowledge space theory. The only modification is that it does not only take into consideration the prerequisite question in step 2 and 3, but also the way that leads there. If there is 0 somewhere there, it will consider the prerequisite question 0, too.

5.2 A brief presentation on the goodness indices of fit

The simplest way to express the goodness of fit of theoretical (hypothetical) models and response patterns is to determine the distance between them. We search for the knowledge state in the model for each response pattern which it is closest to, that is, where the deviation of 0s and 1s is the smallest. If, for example, in the case of a worksheet with 5 questions (*a-e*), a student does not know the answer for the first three questions but s/he responds correctly to the last two, his/her response pattern will be 00011. It may occur in a theoretical model that exactly this knowledge state is also present, and the distance is 0 in this case. However, if it is not present, and closest to it we find 10111, then the minimal distance will be 2. It is with the help of a frequency table that we can describe how many times distance 0 (perfect fit), distance 1, distance 2, etc. occur in the case of all the response patterns. From the point of view of the goodness of fit, it is more favourable if high frequency values occur at small distance elements. It is possible to express distance-based fit with a single number, as it is enough to consider the average of the given distances (0, 1, 2, etc.) weighted by frequency numbers. This is called *average distance* (denoted *ddat*), and the lower value is more favourable, of course. The last index related to distance is the Distance Agreement coefficient, which is calculated in the following way: DA=ddat/dpot. The value dpot is actually an average distance where all the possible response patterns are compared to the theoretical model, not the response patterns resulting from the survey. Lower DA values mean better fit.

Another two indices are used to examine the goodness of fit, which are used for examining the validity of precedence relations. In the case of both indices, we take into consideration the response patterns, which confirm or disaffirm the precedence relations in the theoretical models. The value of the so-called *gamma-index* can vary between -1 and +1, where a positive gamma-index value generally means the validity of precedence relations. Its interpretation and calculation is similar to the gamma index introduced by Goodman-Kruskal (Goodman and Kruskal, 1972). The Violational Coefficient index (VC index) expresses the ratio of disaffirming

response patterns compared to the total number of precedence relations, thus a lower VC value means the better validity of precedence relations.

The exact description of the above indexes can be found in Appendix 2.

6.3 The analysis of the fitting of models

The indices of fit introduced in the above point are summarised in Table 11. Distance indices are represented in the columns „Frequency tables of distances", „ddat - average distance" and „DA". The validity of precedence relations are expressed by the values in columns "gamma-index" and „VC". In the heading of the last four columns, we indicate with arrows which are more favourable index values (↓ - lower, ↑ - higher) concerning fitting. The first three rows of the table refer to *theoretical model 1*, whereas the last three rows to *theoretical model 2*.

Table 11. Fitting the models to response patterns by 169 students and to data resulting from simulation.

Distance		Frequency tables of distances						ddat - average distance (?)	DA (?)	gamma-index (?)	VC (?)
		0	1	2	3	4	5				
theoretical model 1	Data	3	15	60	45	41	5	2.71	0.85	-0.0012	0.2235
	Simulation	3	18	38	55	50	5	2.86	0.90	0.0595	0.2161
	Modified Simulation	5	12	54	58	38	2	2.70	0.84	0.1870	0.1873
theoretical model 2	Data	7	27	55	59	21	0	2.36	0.84	-0.0190	0.2342
	Simulation	11	22	42	70	24	0	2.44	0.87	0.0479	0.2105
	Modified Simulation	7	28	64	55	15	0	2.25	0.80	0.1930	0.1803

As the table shows, there is hardly any difference between the data resulting from the questionnaire and the ones created by simulation. The tendency is evident, the best results are given by modified simulation – which reflects best knowledge space theory -, but indices in the rows of empirical data do not differ significantly either.

7 SUMMARY

We have examined in our study whether knowledge space theory is applicable in representing historical knowledge, if so, in what way. The domain in question was Lajos Kossuth and the Hungarian War of Independence. We prepared a questionnaire on the topic, and it was filled in by 169 high-school and university students. The basis of our analysis results from this questionnaire and the data on the given responses.

The questionnaire has several stages and included multiple-choice questions. First, the relevance of concepts had to be decided on, then gradually more complex questions had to be

answered in three levels, with four possible answers. We set up two models for the two groups of questions, on the basis of the supposed precedence relations between responses, and we tested the fitting of the models to the data in the framework of knowledge space theory. The result we arrived at was that the fitting was almost as good as that of the simulated model, whose only fault is to include the probability of lucky guesses and careless errors.

Our findings offer the possibility to use knowledge space theory in the domain of history when setting up assessment strategies. If the framework of multiple choice tests is retained, the conclusion of this study is that it is worth starting the assessment at the first level, with the relevance of names and concepts, then with their meaning, and it is advisable to move on to next stages in the topic only if appropriate knowledge has been achieved at the first two levels. What exactly is to be considered appropriate knowledge should be further investigated.

APPENDIX A.
BASIC MATHEMATICAL CONCEPTS

Many of the concepts described in this study operate on sets and relations. Only the fundamental concepts of set theory, which are relevant for explaining knowledge space theory concepts in this study, are explained here. We shall follow the approach taken by Falmagne and Doignon (2011).

- **Sets.** A set is a collection or group of definable *elements* or *members*, which we denote by a capital letter (e.g., Q, A, B, X). We denote an element by a lower-case letter (e.g., x, *y, a, b*), and state that "*x is an element of X*" with the notation $x \in X$. The expression $Q=\{a, b, c, d\}$ says that the set Q consists of a collection of 4 elements, *a* through *d*. A set can be also characterized by the properties of its elements, e.g., $A = \{a : a > 1\}$. The *null set* ($\varnothing$) is an *empty set*, or a set with no elements.

- **Subset, power set.** We say that B is a *subset* of A if all the elements of B are also elements of A. We write it as $B \subseteq A$. The *power set* of any set Q is the set of all possible subsets of Q and is denoted by 2^Q. Every power set of any set Q must contain the set Q itself and the empty set $\varnothing$. The *size* or *cardinal number* of a set Q is denoted by $|Q|$

- **Cartesian product**. The *Cartesian product* of sets A and B, denoted by $A \times B$, is the set $A \times B = \{(a, b) : a \in A \text{ and } b \in B\}$. We call *(a, b)* an *ordered pair* or a *tuple*.

- **Relations.** Let A and B be sets. A *binary relation* R between A and B is a subset of $A \times B$. Given a tuple *(a, b)* in $A \times B$, we say that *a* is related to *b* by R if *(a, b)* $\in R$ and is denoted by *(X, P)aRb*.

- **Properties of relations**. A relation $R \subseteq X \times X$ is
  reflexive, when $(x, x) \in R$ for all $x \in X$;
  symmetric, when $(x, y) \in R$ implies $(y, x) \in R$ for all $x, y \in X$;
  asymmetric, when $(x, y) \in R$ implies $(y, x) \notin R$ for all $x, y \in X$;
  antisymmetric, if $(x, y) \in R$ and $(y, x) \in R$ implies $x = y$ for all $x, y \in X$;
  transitive, if $(x, y) \in R$ and $(y, z) \in R$ implies $(x, z) \in R$ for all $x, y, z \in X$;
  total, if for all $x, y \in X$, $(x, y) \in R$ or $(y, x) \in R$ (or both).

- **Quasi orders, partial orders, linear orders**. A *quasi order* is a binary relation R over a set X, which is reflexive and transitive. An antisymmetric quasi order is *partial order*. A total, antisymmetric and transitive binary relation over X is *linear order*. A set X with a quasi (partial, total) order P is called a *quasi (partially, totally) ordered* set and denoted by (X, P).
- **Covering relation, Hasse diagram.** Let (X, P) be a partially ordered set. We say that x is *covered* by the element y when xPy and there is no $z \in X$ with $xPzPy$. The *covering relation* or *Hasse diagram* of (X, P) contains all the pairs (x, y) with y covering x. When X is finite and small, the Hasse diagram of P can be simply displayed by a *directed graph* drawn according to the following conventions: the elements of X are represented by vertex in the plane, with an line segment or curve (edge) that goes upward from x to y whenever y covers x.

Appendix B.
Fitting of the knowledge spaces to observed data

Distance measures and validity coefficients are described in Schrepp, Held & Albert (1999) and Stahl (2008).

B.1. Distances between knowledge space and response patterns
We already gave the definition of response patterns in section 4.2, but here we shall rely on a equivalent variant. We shall represent a *response pattern* by the subset R of Q containing all the questions correctly solved by the subject. There are thus $2^{|Q|}$ possible response patterns.

The distance between a response pattern R and a knowledge state K is defined as the number of elements in the symmetric difference of R and K, that is:

$$dist(R, K) = |(K \setminus R) \cup (R \setminus K)|.$$

The *minimal symmetric distance* of a response pattern R to a knowledge space $\mathcal{K}$ is defined as the distance of R to the nearest knowledge state in $\mathcal{K}$, that is:

$$mdist(R, \mathcal{K}) = \min\{dist(R, K) \mid K \in \mathcal{K}\}.$$

When the response pattern is identical to a knowledge state, the minimal symmetric distance is zero. Positive value indicates a difference between R and $\mathcal{K}$.

The first indicator of fitting is the *distribution of the minimal symmetric distance* over a large number of subjects' response. The second is the *average of minimal symmetric distances*, denoted by *ddat*. The third, the *Distance Agreement Cofficient* (*DA*), compares the average symmetric distance between the knowledge space $\mathcal{K}$ and individuals' response patterns (referred to as *ddat*) to the average symmetric distance between the knowledge space $\mathcal{K}$ and the power set of response patterns 2^Q (referred to as *dpot*). Formally, *DA* is calculated as the ratio of *ddat* and *dpot* (*DA=ddat/dpot*).

B.2 The gamma-Index and the Violational Coefficient (VC)

The gamma-index and the violational coefficient calculate validity coefficients for prerequisite relations and knowledge spaces.

The gamma-Index is similar to Goodman and Kruskal's Gamma (Goodman and Kruskal, 1972). It depends on two quantities, the number of pair of problems that are represented by a prerequisite relation (i.e., concordant pairs, N_c), and the number of pair of problems that are not represented by a prerequisite relation (i.e., discordant pairs, N_d). A pair of problems in a response patterns are concordant if the prerequisite problem is correctly solved (1) and the covering problem is failed (0). A pair of problems are discordant if the prerequisite problem is failed (0) and the covering problem is correctly solved (1). All tied pairs are ignored (1-1 and 0-0). Gamma-index is calculated by

$$\gamma\text{-index} = (N_c - N_d) / (N_c + N_d)$$

The Violational Coefficient (VC) also validates prerequisite relations. The number of violations (i.e., the earlier mentioned discordant pairs) against a prerequisite relation are calculated, and defined as

$$VC = \frac{1}{n \cdot (|\leq| - m)} \sum_{i,j} v_{ij}$$

where n denotes the number of subjects, $|\leq|$ refers to the number of pairs in the relation, m denotes the number of problems, and v_{ij} again refers to the number of discordant pairs.

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