

# FROM FENCE TO WALL? CHANGES OF MENTAL SPACE OF BORDER ZONES IN EASTERN EUROPE

Andrea Székely<sup>1</sup> – Balázs Kotosz<sup>2</sup>

<sup>1</sup>corresponding author, Associate Professor, University of Szeged, HABITER, URCA, [szekelyandree@gmail.com](mailto:szekelyandree@gmail.com) 6724 Szeged, Mars tér 7. Hungary.

<sup>2</sup>Associate Professor, University of Szeged, [kotosz@eco.u-szeged.hu](mailto:kotosz@eco.u-szeged.hu)

After September 2011, but particularly after the 2015 and 2016 events, the geopolitical situation of the world is radically changed. New hot spots were created, including the European migrant crisis and its local manifestations. In this paper, we focus on the Serbian-Hungarian border where the fence building turns this research relevant. Through a survey including mapping mental cognition of borders, we monitor the hypothesis that the closeness of the border appeared in the mind of local population, but their security perception did not increase significantly. Persisting asymmetries and polarized revelations landmarks the changing border zone.

Keywords: border zone, mental map, fence, Hungary, Serbia

JEL codes: R58, R59, C83

*Paper presented at 57<sup>th</sup> ERSA Congress 29 August – 1 September 2017, Groningen  
Not to be cited without authors's permission.*

## Introduction

Early definitions and classifications led up to the general concepts of cross-border space in the 1990's, particularly in the works of Ratti (1993) and Renard. The spatial organization of cross-border regions is typically represented in schematic maps, including more or less objects (border line, rivers, roads, railroads, canals, cities and other settlements, etc.) and flows (capital, labor-power, tourists, migration, etc.).

The mental or cognitive representation of space is not a new form among the behavioral geographical research methods. Since Lynch's book (1960) work on visualization at the urban scale, the cognitive mapping is used largely not only in the USA, but across the world. These maps represent the subjective mapping of the real space around a human. All cognitive characteristics belong to the mental mapping which give us the possibility to collect, class, and store space related information and if necessary evoke and redevelop them. Drawings of people reflect perceived elements of theoretical schematic maps, they can include elements of space, objects, but also flows can be expressed through these representations. While schematic maps are generally multifocal and complex, the mental maps show individual perceptions. In our paper, we check the validity of several concepts in a deductive way. Due to its subjectivity, a generally accepted classification of these maps is not appeared yet.

After the 2015 and 2016 world events, the geopolitical situation of the world is radically changed. New hot spots were created, including the European migrant crisis and its local manifestations. The Serbian-Hungarian border zone is situated in Central Eastern Europe, in the Southern part of Hungary and in the Northern part of Serbia. From geographical point of view, it is a plain with homogenous landscape. The borders of Serbia changed the most frequently in Europe during the last 150 years, the almost three decades long collapse of the Yugoslav State has not been finished, as Serbia's Southern border with Kosovo is not fully recognized in the international community. Hungary is member of the European Union since 2004, Serbia is not yet member. The fence building on the Serbian-Hungarian border as an answer of Hungary to the 2015 migrant crisis turns the actual research relevant. The main aim of the fence building (over the physical obstacle) was to sign clearly the closeness of the border for outsiders and demonstrate security for those who on the inner side of the fence. The principal hypothesis of the research is that the closeness of the border appeared in the mind of local population, but their security perception did not increase significantly.

The goal of the paper is to emerge information about border cognition of the inhabitants: to know and compare what (which image, sense) is in the mind of borderlanders on both sides on the Hungarian-Serbian border. We do it through questionnaire survey, including classical questionnaire and mental map drawing. As the openness and closeness of borders is a main issue in the literature, we try to describe borderlanders' judgement on it. We present the first results of the situation after the migrant crisis, and we analyze how the border image was changed during the last 15 years.

The rest of the paper is constructed by the following. In Part 1, we summarize the theory of real border functions and border perception with a critical view on the applicability of the theory on Eastern European conditions. Part 2 will be devoted to a short methodological summary of questionnaire surveys executed in data collection, while in Part 3 we summarize

the results of the pilot study on Serbian-Hungarian border section and compare these results to a previous one. A general conclusion is given at the end.

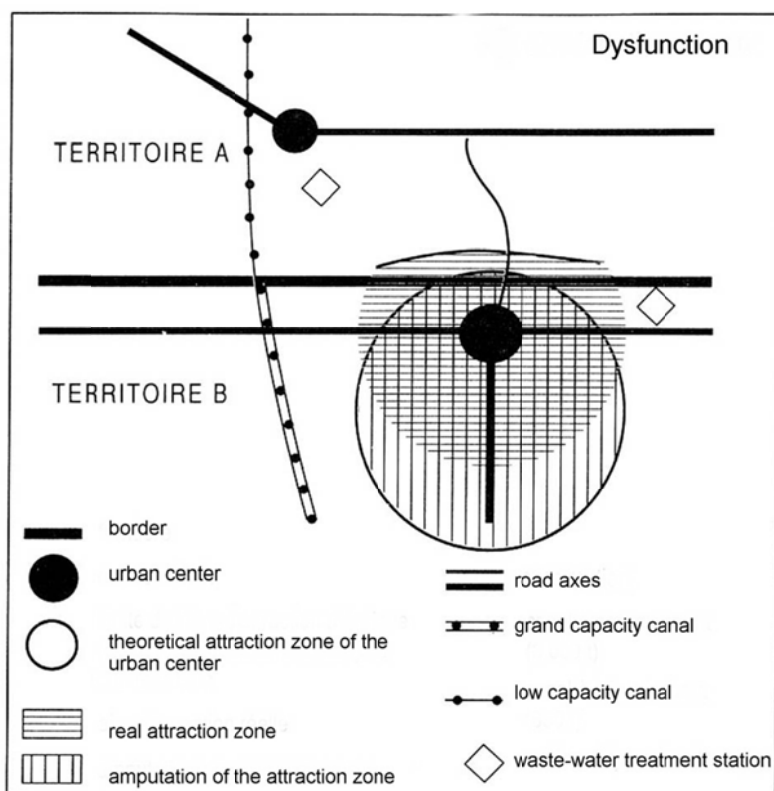
## 1. Theoretical background

In the first part, we summarize the theory of real border functions and border perception. After the demonstration of the opening period of borders, we focus on the literature of the rebordering process. The second part of the chapter is about perception, with a special focus on border perception.

### 1.1. Border structure, objects and flows

We analyze here a set of schematic maps, one of the more detailed in the literature. Renard and Picouet published their maps in 1993, so some elements are subject to update (see e.g. Székely 2013). This set of maps separates 4 stages of development from the almost closed border to a symmetric and fully open situation.

Figure 1: Dysfunction of borders

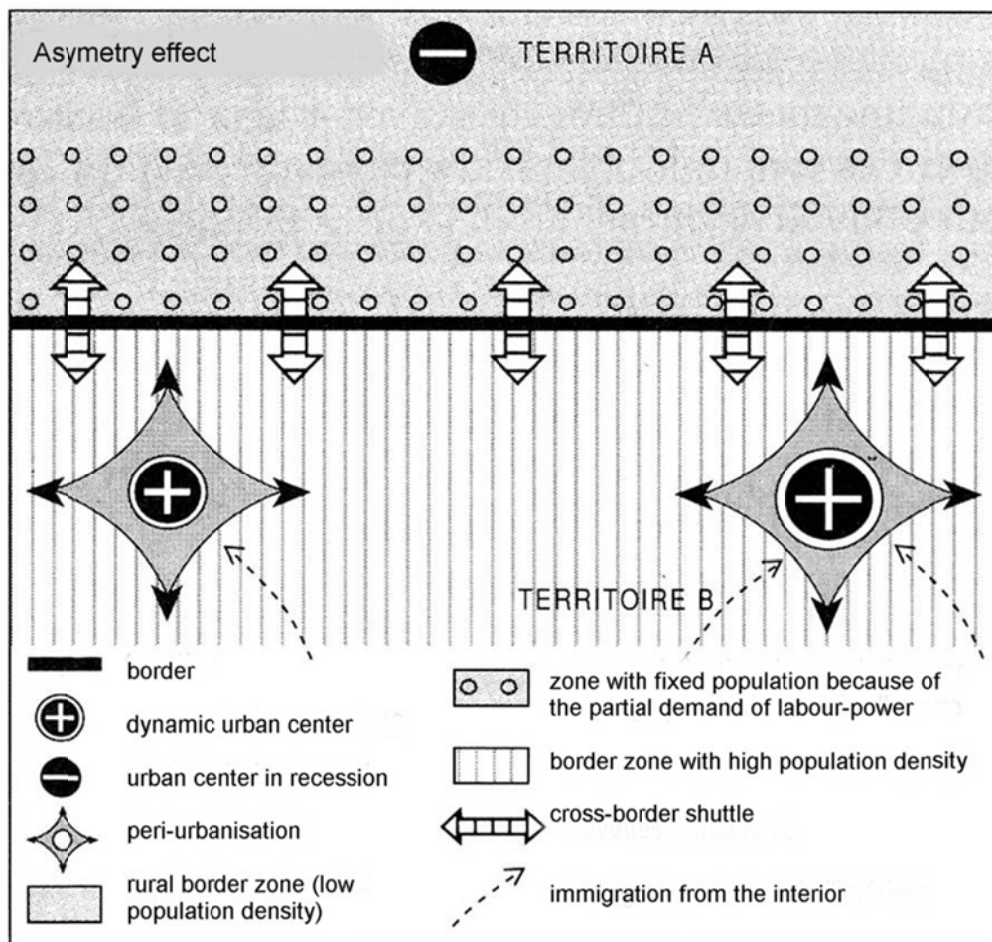


Source: Renard, J.-R – Picouet, P. (1993)

In the stage of dysfunction of borders, border line *a priori* separates the territory A (less developed) from territory B (more developed). Urban centers are present on both sides of the border. The urban center of territory B has an important role of the dynamism of this border area. The road axes are mostly parallel with the borderline, border crossing possibilities are

rare. The *objects* of this map are the typical targets of the first-stage cross-border cooperation projects: amelioration of traffic channels (roads, canals, maybe railroads) and building common capacity of waste-water treatment.

Figure 2: Asymmetry of border



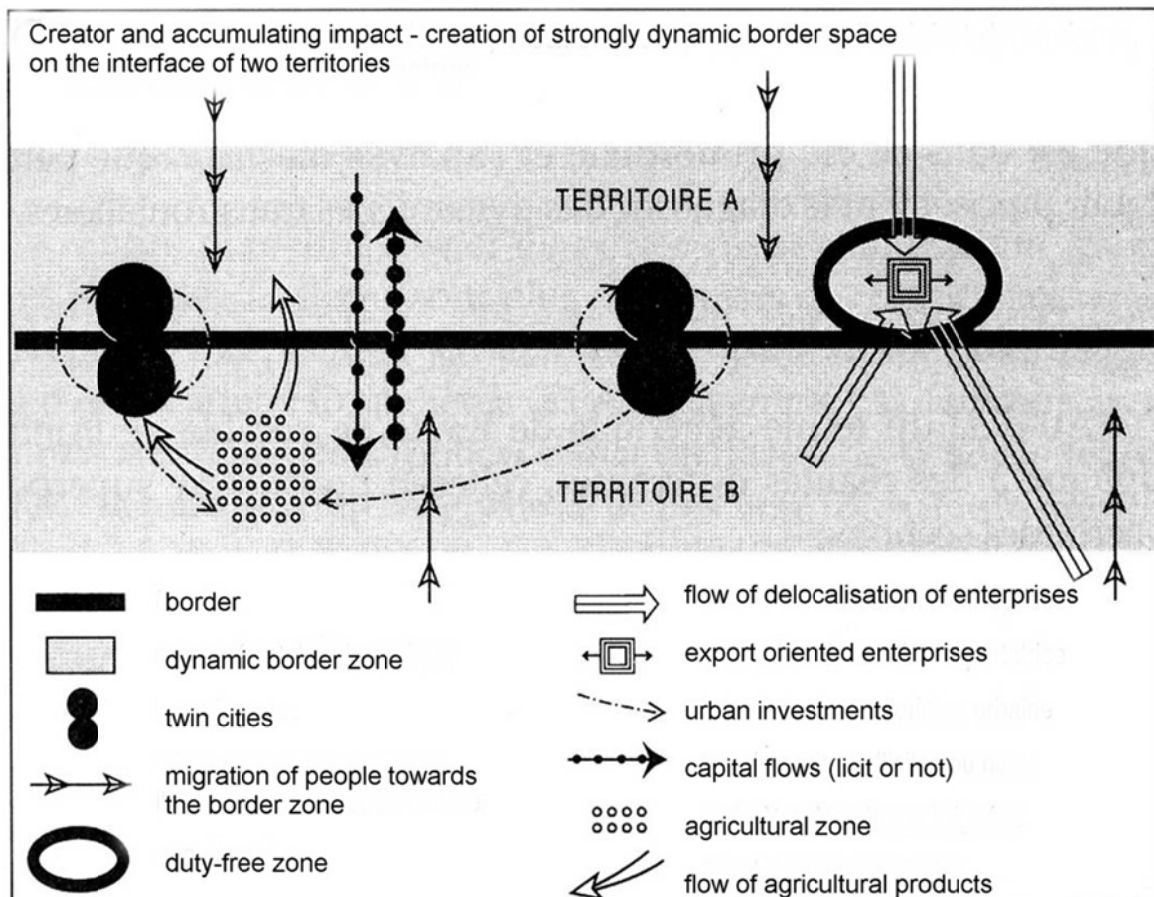
Source: Renard, J.-R – Picouet, P. (1993)

The second level is a filter-border (see Figure 2). On the schematic map, we can see that the single urban center of territory A is in recession, the population density near the border area is weak. Around the dynamic urban centers in territory B we can observe the modern phenomenon of periurbanization. On the highly-developed territory B, two urban centers are present; the more intensive urbanization magnifies the asymmetry effect of the territory. The cross-border shuttle between the two territories is active; in territory A, the unemployment is high. The new *objects* of the map are the cross-border shuttles.

The third level of cross-border cooperation (see Figure 3) is a strongly dynamic border space on the interface of two territories. In that case cities are next to each other in the border zone (classical type of twin cities). Cities are quite dynamic on both sides of the border because of the flows of people and capital towards the border zone. The flow of agricultural products concerns both sides of the border. Level of development is similarly high on both sides of the

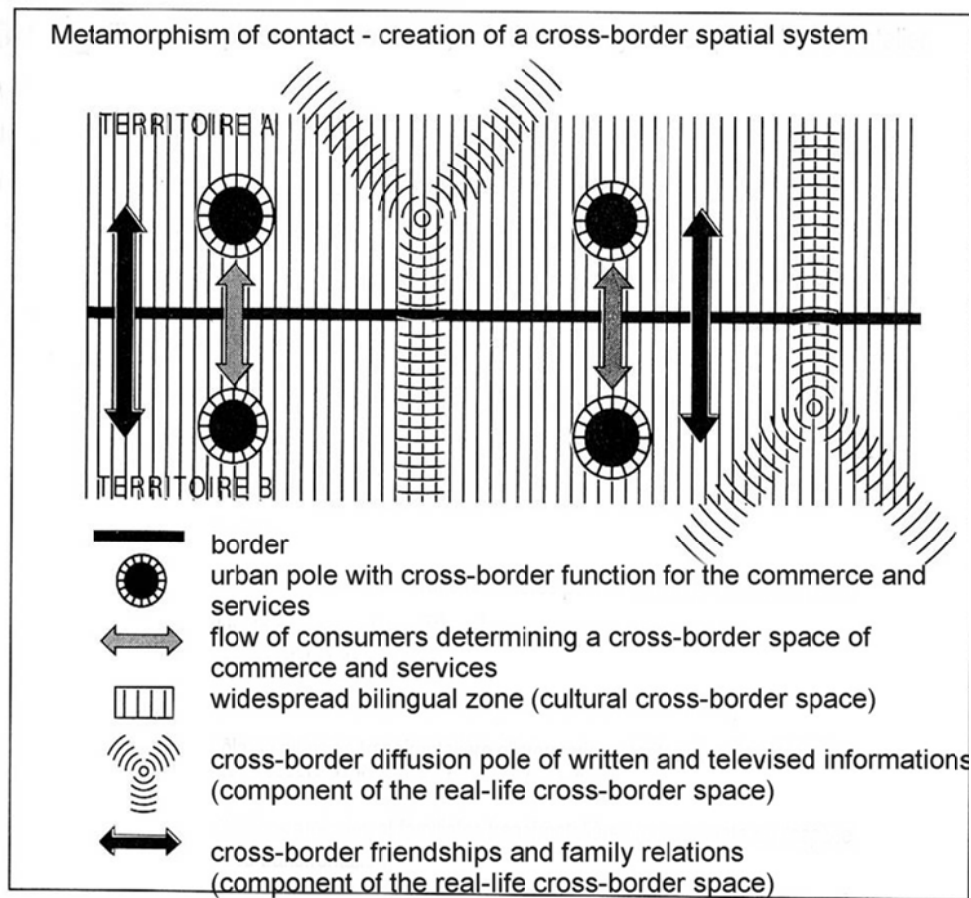
border, but physical proximity of actors (cities, enterprises) is important in the cooperation. The integration reached the level where investments are bilateral, production is specialized, but balanced. The new *objects* of the maps are agricultural zones (until this phase, agriculture was local and not integrated), and the duty-free zone with industrial parks. The border should be open to have the possibilities of moving capacities of enterprises into these parks. At this level, the infrastructure is supposed to be complete; the balanced level of employment does not require a large volume of daily commuting.

Figure 3: Strongly dynamic border space



Source: Renard, J.-R – Picouet, P. (1993)

Figure 4: Meta-morphism of contact



Source: Renard, J.-R – Picouet, P. (1993)

The fourth stage is the most integrated territory, where the border lost completely its function, it is present only as a landmark. This border zone is a widespread bilingual zone without obstacles before the commerce, the services and the personal contacts. The urban poles are situated in the border area; between them the flow of consumers and services is high. The cross-border diffusion poles assure a good base of cooperation between the territory A and territory B. The family relations and cross-border friendships are also strengthened in that integrated cross-border region. This map is perfectly symmetrical; the most important *new elements* are the cross-border information sources (nowadays, common web sites and social networks).

We can see on this set of maps that only a very high level of *social and economic integration* can eliminate the break effect of borders: a common language (or perfectly bilingual zone), fully integrated economic functions and same living standard are necessary conditions for a metamorphosis. In Western Europe, we can find two examples: the metropolis of Lille (with a cross-border region in Belgium) and the triborder zone of Luxembourg-Belgium-France. Eastern European border zones are typically in the second phase of development (asymmetry) but we can find some examples of first and third stage territories.

By two scholars, Rosière and Jones (2012) a new era of border studies began after the terrorist attacks of 11 September 2001. Instead of the process of “opening” of borders, we are witnesses to a “hardening process” of borders. The word “hardening” refers to building any kind of closure system to prevent undesired entrance or immigration flows. The hardening effect does not cut totally the flows, its main goal is attempting to control all cross-border movements and directing them to appropriate check-points. This process generates an asymmetric space because of the distortion of the artificial separation. In this case, we can clearly distinguish filter function of the border. The filtration is made by securitization; in theory, all goods and bodies are controlled (the latter by sophisticated biometric systems), and authorities guard and use millions of data. The same filtration process appears in the work of Basilien-Gainche (2015). The contemporary world is characterized by the massive development of barriers on international borders, so the role of checkpoints is not to be neglected. The question of permeability and its management is stressed out in the work of Razac (2013) and shows clearly that behind the openness and closure of borders stand the question of management the permeability. Next to the hardening process Rosière and Jones introduce the concept of teichopolitics as a way of protecting privilege and to develop economic advantages. This concept distinguishes 4 types of barriers to complement fence, wall, front, and closed straits (Rosière-Jones, 2012). The first three of four categories are not clearly demarcated, in Wills’ (2016) example, the wall, fence and barrier expressions are used to the same real phenomenon from adverse geopolitical points of view. The concept of teichopolitics can be practiced in many ways according to the geopolitical power of the State on the world, to its economic, infrastructural development level.

Next to the new teichopolitics concept, we have to stress out of the existence of debordering-rebordering process on the borders in Europe. (Scott 2009, Dimitrovona 2008, Paasi 1998, Houtum-Naerssen 2002) “Debordering and rebordering is an ongoing dualism in contemporary European politics.” (Yndigegn, 2011, 47) While the European Neighborhood and Partnership Instrument is working on the fall of borders, security policy is on building them. Cierco and da Silva (2016) confirm that as an aftermath of the migrant crisis in Europe, a new double view of the border re-appeared, they are important elements of sovereignty of member states.

By Houtum et al (2016), the conceptions of borders have shifted due to large-scale geopolitical rearrangements, in Europe the dissolution of the Soviet Union has a vital impact even 25 years after, the geographical position of asymmetries moved, but they are still present. In a smaller scale, this approach can be applied for the ex-Yugoslavia.

## **1.2. Perception of space and borders**

### **1.2.1. Spatial perception**

The concept of the cognitive or mental map emerged in psychology, it is widely used in different scientific fields: in geography (Downs-Stea, 1973, Beauguitte et al 2012, Balázs-Farsang, 2016), psychology (Hirtle-Jonides, 1985) ecology (McKenna et al (2008), in socio-linguistic (Györffy, 2016) management (Eden, 1988) and in applied sciences (such as urban development, spatial planning (Letenyei 2005). It shows well the inter-disciplinary nature of

the notion. The American psychologist Tolman (1948) used first the concept of cognitive map for the description of rats' spatial learning. Kevin Lynch's seminal work, published in 1960, *The Image of the City* placed the corner-stones of cognitive mapping in urban planning. His approach was quite practical, in American megacities, he analyzed the understandability of spatial structure. His theory is composed of five pieces of information: paths, edges, districts, nodes and symbolic landmarks. (Györfy 2016)

The construction of mental maps can be divided into seven stages: observe, filter, color, assume, conclude, believe, and act. (Senge 1994) These stages can be followed in the perception and cognitive mapping, as people observe the phenomenon, filter the information (generally through preconceptions), color with not observed circumstances, assume not observed background, conclude the observations already filtered, colored and burdened by half-truth assumptions. They believe their conclusions and act by this believing. When we analyze their actions in a given situation, the elements of the process are hardly verifiable.

“A mental map is not as complete and objective as a topographical map. A mental map is a unique, personal and selective representation of reality. We all use mental maps; they are not identical, but have common aspects. Mental map is used as a reference for orientation and movement throughout a territory (routing), but also for associative processes and judgement valuation. Mental map is based upon personal experience with an area, but by lack of this upon indirect information from mass media or a certain reputation.” (Sulsters, 2005, 1) Hirtle and Jonides (1985) or Sulsters (2005) show in their work that mental maps represent in subjective way not only spatial information but also introspections about the close or large environment. They indicate spatial and non-spatial character of the real word representation. The spatial characters of mental map are the distance and the relative location. However, general critics is based on the measuring, as drawings, pictures or sketches cannot be read in objectively. Akcali (2011) argues that mental maps are tools of qualitative research in interdisciplinary approach, respondents draw the mental territorial representation. She applied the method for conflict management in minority studies.

Knowing this variegation (subjectivity, interdisciplinarity, qualitative character), it is not surprising that definitions and characterizations of cognitive or mental mapping are widely scattered in the literature, with the extremity of refusing of the word 'map' and accepting only 'image' (Letenyei 2005). The expressions of cognitive mapping and mental mapping often used as synonyms, but also as subset of each other. Kitchin (1994) stresses out the possibility of misunderstanding and misuse among geographers and psychologists. Kitchin (1996) concludes that scholars of the two disciplines should work together and create a common view how measure the spatial knowledge.

Didelon et al (2011) distinguish four categories of mental map: cognitive map (an individual's un-mapped spatial knowledge, its subjective space), sketch map (realized in the framework of a survey where people are asked to draw a specific space on a *blank* page), interpretative map (one has to provide its appreciation on a space or to delimit a phenomenon) and classical mental map (cartographic synthesis of individual results obtained from a survey on the space). By Letenyei and Morauszki (2015) collection of data about spatial cognition can take many forms:

- 1) purely quantitative form




- 2) purely qualitative, not drawing-based form
- 3) freely drawn maps, aided by free recall of images
- 4) map drawing with the purpose of standardization
- 5) can be based on existing images or maps

No matter which method is used, two types of date are collected (Letenyi and Morauszki, 2015):

- 1) information pertaining to the area
- 2) data reflecting the interviewee's opinion

To place our research in the wide range of possibilities, we created a scale starting from the strict mental map where a pre-drawn map is given to the respondent and fix settlement should be orientated on it; through the Lynch type of pre-drawn map with a larger set of allowed symbols; to the free sketch map, where respondents have only a blank page and they are free to draw anything about a geographically defined object (in our case, the border). Our free sketch map method can fill the missing quadrant of Uszkai (2015b), who reported that research on cognition of the border line is not available yet.

Table 1: A scale of mental maps

	Strict mental map	Lynch type	Free sketch map
			
Base map	yes	yes	no
What to draw?	points for settlement names	paths, edges, nodes, districts, landmarks	not limited
The knowledge measured	geographical positioning	mental image	mental image
Possible conclusion	spatial, geographical knowledge	mixed spatial cognition	characteristics of the place (not always connected to geographical features: e.g. corruption)
Verifiability	objective and fully verifiable	mixed	low

Source: Own construction

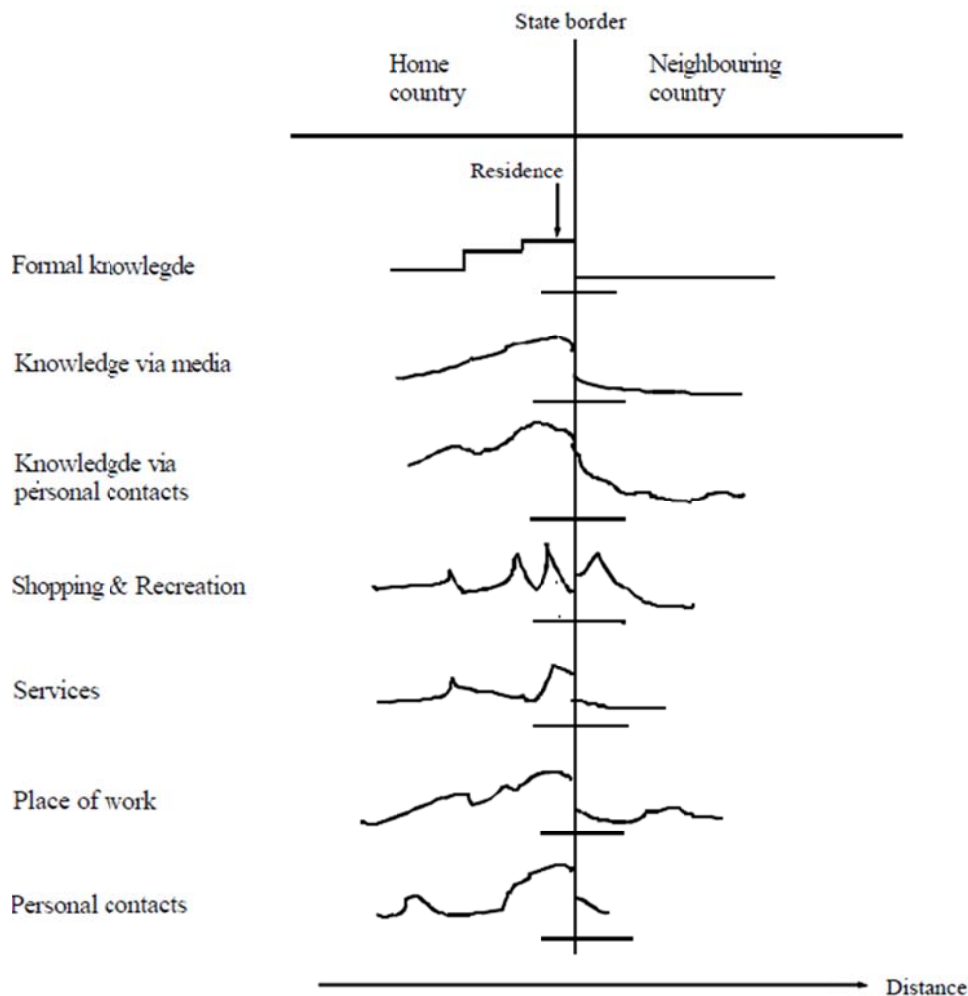
Researches based on mental maps show different territorial scopes (Gold, 2009). This typology can be applied to classical mental maps of Didelon et al (2011) or type 5 of Letenyei-Morauszki (2015). Spatial cognition can be measured at local (e.g. Lynch, 1960), regional (e.g. Balázs-Farsang, 2016), country (e.g. Michalkó, 1998, Kiss-Bajmócy, 1996, Uszkai, 2015a) or world level (e.g. Didelon et al, 2011) depending on the scale of the map given to respondent. This typology moves us towards the importance of distance. As Csépe et al (2011) mention, the level of knowledge about space can be in close connection with the measuring scale. The smaller is the space represented by the cognitive map, the experience is more direct. According to the growing scale of territorial level, the role of secondary information and of the indirect learning process is increasing. Didelon et al (2011) affirms that nowadays the connection between geographical distance and spatial knowledge is not relevant, because the information arrives through digital channels. Mishra and Mishra (2010) highlights that in many cases, people overestimate the role of the border in disasters, as

distance seems to be higher in the presence of a human-made boundary. In our research, we examine the cognition about border and border zone by the inhabitants of the border zone, where the personal experience is strong. We have doubt about the validity of the theory neglecting geographical distance.

### 1.2.2. Border cognition

The border may sometimes function as a true barrier in a cognitive sense, information about events on one side of the border rarely (or not at all) reaches the other side. As Figure 5 shows, by Houtum (1998) the border has a crucial role in the cognition.

Figure 5: Spatial cognition in a border region



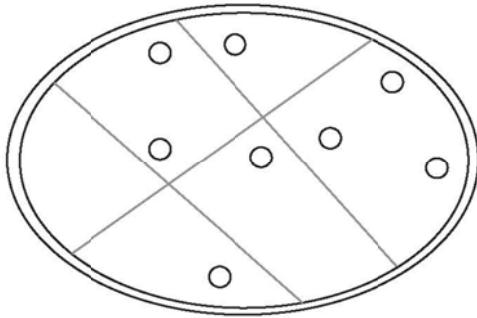
Source: Houtum (1998, 46)

The formal knowledge about the other side of the border is limited, even if the media and personal contacts give some fix points for the cognition (the role and weight of these types of communication has changed in the last decade mainly for young population). Newspapers and television programs focus primarily on the country or region in which they are made. In the case of shopping and recreation, the border may have a positive effect on the cognition; if quality or price differences are supposed, the spatial distribution of commerce is distorted. The spatial inequality of services can be explained by their non-traded (or at least less traded) characteristics. In several cases the border cut the personal contacts due to communication problems (including eventual difference in language). If we are thinking about a whole border region, it is natural that the personal contacts decrease with the geographical distance, but without borders this decrease would be continuous. In this case, Houtum analyzes the relation

of geographical distance and perception and he searches the impact of the border on this relationship.

Moullé (2013) created a model of double (inside and outside) border view emphasizing the European experience (see Figure 6). In the empirical part of the paper, we compare the cognition on the two sides of a Schengen border which makes this theory relevant.

Figure 6: Inside and outside view of the European borders



Source: Moullé (2013, 9)

The double line stands for the outer border of Europe (literally the controlled Schengen border) from outside perspective hardly traversable (e. g. Lampedusa), from inside perspective distant but controlled border. The role of interior borders (simple line) is difficult to understand from outside, they lost their power from an inside view. The circles show the forbidden enclaves (e.g. protected residences) for the outsiders, and protection (e.g. closed residences) for insiders. These enclaves are the gated communities in the behavioral geography meaning of Gold (2009): “gated community is a residential community protected by physical barriers or symbolic means in order to exclude intruders.” The intruders are the Others of Houtum and Naerssen (2002), or as this “othering” is explained by Newman: “The stronger the barrier function of the border, the more powerful the imagined, the more abstract the narrative of what is perceived as lying on the other side.” (Newman 2003, 20)

## 2. Methodology

To map the perception of these objects and elements by the border zone residents, we applied a questionnaire of 25 questions about their perceptions, opinion, facts and intentions. The first wave of the research was executed in 2003 around Hungary at all 7 border sections within 30 km distance of the international border. We could fill in 1995 filled questionnaires on both sides of the border (273 on Hungarian-Serbian border section). The main results of this survey were summarized in Székely-Kotosz (2005) and also in Székely (2017). The new wave was launched in 2016, first with a pilot study on the Hungarian-Serbian section, where 218 questionnaires were filled in. The choice of this border section was based on the events in 2015-16, including the migrant crisis and the building of fence on this section of the border.

Most of the questions in the questionnaires are simple yes/no type ones. In some cases, we let space to explain better the choice, but the evaluation of these verbal answers is out of the scope of this paper. Satisfaction questions are on a seven grade Likert-scale (1 is the worst, 7

is the best), basic demographic data (age, sex, family status and the settlement type of the respondent) was also collected for further analysis and typology. The special last question of the questionnaire was: *What do you mean the border? Draw it.* This question is the blank paper version of cognitive mapping. For temporal and spatial comparison of the survey results, we used simple descriptive measures, while we used typology creation for drawings. The last question opens the possibility to analyze which theoretical elements are present in people's mind, which objects and flows are dominant in their perception. However, analysis of pictures created by the respondents is more complex. They vary by their elaborateness (including just a flag or a line, but also more than 40 elements). Sometimes it is hard to identify what is on the drawing, and we should consider that mapping flows is always more complicated than simple objects. Thereby, classification of mental representation is not clean-cut, sometimes it is subject to the discretion of the analyst. This is the reason why we use just approximate distributions.

### 3. Comparative analysis of the questionnaires

In this section, we compare the answers of the questionnaires in 2003 and in 2016, and the Hungarian and Serbian side of the border. This way, we can conclude not only temporal changes, but the asymmetric perception of the border can also be caught.

Table 2. Impact of living in the border zone (distribution of answers, %)

Answer	2003		2016	
	Hungary	Serbia	Hungary	Serbia
<b>Positive</b>	30	7	30	8
<b>Neutral</b>	33	33	48	46
<b>Negative</b>	37	60	22	46
<b>Improvement in the last 12 years</b>	26	33	42	31

Source: The author's calculation

In Table 2, the impact of living in the border zone is analyzed. The feeling of living in the border zone is significantly better in Hungary than in Serbia, the clearly positive view did not change in time. However, a decrease in negative opinion can be observed in both sides of the border. A great example of mental distortion is the fact that more than 30% of the respondents signed an improvement during the last 12 years (after regime change in the first case, after Hungary's EU accession in the second case), but not more than 15% of the respondents reported better situation in 2016. While in Hungary, the Southern border region is a periphery, in Serbia it is the gate towards Europe. This fact does not help to understand the opinion.

We wanted to get information about the knowledge of local population about cross-border cooperation and flows. The quite varied picture is reported in Table 3. While a majority of people are familiar with the fact that their settlement is participating in a cross-border cooperation, only a few of them have heard about the most common institution of this cooperation, the relevant euroregion. In 2003, the still existing Danube-Tisa-Körös-Mures Euroregion functioned in the border zone with the participation of Serbia, Hungary and

Romania. In 2016, the new institution for cross-border initiatives Banat-Triplex Confinium EGTC acts also in the border zone. An important fall of knowledge about euroregions in Serbia suggests the lack of transparent activity of these institutions. While twin city relations did not engender in large quantity, their frequency improved in Serbia. The contrary is true for investment in CBC projects, local people in Hungary got knowledge of them. On Serbian side, the financial allocation mechanism of EU Funds is different from Hungary (because of the non-EU member status of Serbia), so the low knowledge in 2003 about the rare possibility is comprehensible. The EU financed cross-border programs were twice as known in Hungary than in Serbia in 2003, and it reversed in 2016. While EU Structural Funds and regional policy tools are well-known in Hungary, its cross-border component stepped significantly into the background. Foreign (not necessarily neighboring) direct investment seems to be dropped in both countries, but more in Hungary. In the job market, in 2003, the dominant direction of commuting was towards Hungary, the Serbia oriented movement is enforced by 2016 (see Table 3). In the Serbian border zone, relatively young enterprises (5-6 years) dominantly in the food industry offer the possibility of work.

Table 3. Knowledge about ... (distribution of answers, %)

Answer	2003		2016	
	Hungary	Serbia	Hungary	Serbia
<b>Participation in cross-border cooperation</b>	63	73	62	81
<b>Euroregions (full)</b>	9	12	6	5
<b>Euroregions (partial)</b>	5	21	11	5
<b>Twin city</b>	55	64	57	85
<b>Investment in CBC project</b>	23	31	48	27
<b>EU cross-border programs</b>	64	30	32	58
<b>FDI</b>	49	33	19	27
<b>Outgoing job mobility</b>	32	93	65	100

Source: The author's calculation

The general interest towards the events on the other side of the border decreased in both countries, but the asymmetry persists in favor of Serbia (see Table 4) As well known, a barbed wire border fence was erected in September 2015 on the whole Hungarian-Serbian borderline due to the migrant crisis. The impact of the fence appears rather on the drawings, but not yet present in the general interest (as it should be by the theory of "Others" by Houtum and Naerssen (2002) and Newman (2003).

Table 4. Interest on the other side of the border (mean (standard deviation))

2003		2016	
Hungary	Serbia	Hungary	Serbia
<b>4,50 (1,62)</b>	5,31 (1,61)	4,26 (2,08)	4,64 (1,44)

Source: The author's calculation

In 2016, we asked about the Schengen treaty. Not surprisingly, its positive impact is better perceived in Hungary than in Serbia, as Serbia is out of this zone (see Table 5). We can apply the model of double border of Moullé (2013): the borderlanders of Serbia have the exterior view of EU, those of Hungary have interior view.

Table 5. Impact of Schengen (distribution of answers, %)

Answer	2016	
	Hungary	Serbia
<b>Positive</b>	59	15
<b>Neutral</b>	25	45
<b>Negative</b>	16	40
<b>Total</b>	100	100

Source: The author's calculation

Local people observe the movement of the citizens of the neighboring country. As Table 6 suggests, about 90 percent of the population knows this type of flow. While in 2003, by the perception of people in Hungary, Serbian people were coming to Hungary motivated by job search (followed by reason of family relations and shopping), Hungarians were attracted by family relationships and the black market. In 2016, the general picture in Hungary is more balanced, while more scattered in Serbia. There is a dramatic fall in (legal or illegal) business journeys towards Serbia, it is counterbalanced by the increase of tourism. This fact suggests a move from stage 2 to stage 3 in the Renard-Picouet interpretation, as spare-time activities are also organized in the common space. In 2016, the knowledge about the increasing number of Serbian persons who commute for studies to the Hungarian border zone (exactly to the city of Szeged) increase significantly. The attractiveness of the University of Szeged as a center of knowledge transfer in the border zone is high and influences the actual flow.

Table 6. People coming from the other side of the border (distribution of answers, %)

Answer	2003		2016	
	Hungary	Serbia	Hungary	Serbia
<b>Shopping</b>	54	45	48	50
<b>Family relations</b>	55	69	51	73
<b>Business</b>	26	29	21	12
<b>Tourism</b>	55	12	46	27
<b>Job</b>	63	14	58	12
<b>Black market</b>	32	63	30	12
<b>Other (e.g. education)</b>	4 (4)	4	38 (23)	8
<b>Overall</b>	85	98	90	89

Source: The author's calculation

Satisfaction with local circumstances is a principal factor of retaining ability. General satisfaction is much higher in Hungary, with some deterioration in the case of local government, police and customs office. Surprisingly, people remains to be very satisfied with the work of customs offices (see Table 7). The questions of medical attendance, local

government, and infrastructure were the worst judged by the Serbian inhabitants in 2003. The public safety is considered as improving in Hungary while worsening in Serbia. At the same time satisfaction with the police is similarly decreased in both countries. The asymmetrical change of public safety can be related to the construction of the fence. Hungary is on the ‘safe’ side of the fence in mind, according to the Moullé (2013) model.

Table 7. Satisfaction with... (mean (standard deviation))

Answer	2003		2016	
	Hungary	Serbia	Hungary	Serbia
<b>infrastructure</b>	3,52 (1,41)	2,90 (1,32)	4,22 (1,60)	2,81 (1,63)
<b>public safety</b>	3,81 (1,49)	3,34 (1,43)	4,22 (1,55)	3,08 (1,81)
<b>education</b>	3,80 (1,49)	3,21 (1,79)	4,31 (1,58)	3,77 (1,37)
<b>medical attendance</b>	3,96 (1,40)	2,59 (1,28)	3,98 (1,51)	3,27 (1,80)
<b>commerce</b>	4,34 (1,50)	3,87 (1,47)	4,48 (1,70)	3,38 (1,58)
<b>local government</b>	4,30 (1,77)	2,85 (1,45)	4,20 (1,74)	3,23 (1,73)
<b>police</b>	4,83 (1,30)	3,64 (1,57)	4,36 (1,60)	3,28 (2,03)
<b>customs office</b>	4,78 (1,33)	3,69 (1,74)	4,68 (1,46)	3,80 (1,58)

Source: The author's calculation

About three fourth of the population is satisfied with the number of border crossing points (see Table 8). The number of road crossing points increased, but did not solve the summer peaks on the highway. The decreasing satisfaction in Hungary can be lied to the fact of closing the Szeged-Subotica railway line during the migration crisis.

Table 8. Satisfaction with the number of border crossing point (distribution of answers, %)

Answer	2003		2016	
	Hungary	Serbia	Hungary	Serbia
<b>Yes</b>	87	73	76	77
<b>No</b>	13	27	24	23
<b>Total</b>	100	100	100	100

Source: The author's calculation

Table 9. Intention to move off from the border zone (distribution of answers, %)

Answer	2003		2016	
	Hungary	Serbia	Hungary	Serbia
<b>Yes</b>	39	33	45	35
<b>No</b>	61	67	55	65
<b>Total</b>	100	100	100	100

Source: The author's calculation

A more important and increasing part of the Hungarian border zone population would like to move from this zone. This result is contradictory to the impacts of the periphery theory: Hungarian population see more advantages of living in the periphery. This fact can be



explained as other impacts (e.g. security, or simply general approach to removal) are stronger than consequences of the core-periphery relationship.

The last question of the questionnaire was. *What do you mean the border? Draw it.* The distribution of drawings is more polarized in 2016. Some types are almost or totally disappeared (classical mental maps of relative position of the depicter and the border, and the boundary stone as an example of Lynch's symbolic landmark. The polarization leads towards the enhancement of flows and blockings: the border crossing process (with existing control points) and separation in the form of simple lines or fences and walls. As the Hungarian government built a fence in 2015 on this border section before the sampling, an increased proportion of such objects in the cognition is not a surprise. The ten percentage points of difference between the two sides of the border shows the partial impact of different communication (as the fence is a fence from both sides of the border); the Hungarian government popularized the hardening function (see Rosière-Jones, 2012) of the fence through all available channel.

Table 10. Mental map typology (distribution of answers, %)

Drawing type	2003	2016	
	The whole survey	Hungary	Serbia
<b>Border crossing</b>	25	40	50
<b>Classical mental map</b>	20	5	0
<b>Separating line</b>	10	20	25
<b>Boundary stone</b>	10	0	0
<b>Fence or wall</b>	15	25	15
<b>Section specific</b>	20	10	10
<b>Total</b>	100	100	100

Source: The author's calculation. Because of the mixed character of several drawings, percentages are rounded into 5 percent.

## Conclusion

In our paper, we tempted to test several theoretically relevant theories of European borders. The opening process of Renard and Picouet, the closing process of Rosière and Jones, the breaking role of the border in spatial perception of Houtum and asymmetrical cognition of Moullé were in the centre of our interest. We applied simple questionnaire to know the knowledge, opinion and interest of borderlanders, and the free sketch map method for mental mapping.

After analyzing questionnaires and drawings, we can conclude that the evolution of cognitive difference is proved. While generally a significant improvement of the perception of the border cannot be shown, typically first and second stage (dysfunction or asymmetry of Renard and Picouet) situations are expressed without moving towards metamorphism; the impact of the fence is quite clear, as the border is mentally more closed, the impacts of teichopolitics described by Rosière and Jones are present.

Houtum's asymmetry could be caught through the detailedness, drawings were more detailed in the home country side in the 2003 wave of the research. As in 2016, classical mental maps

disappeared from drawings, this kind of asymmetry, and thereby Houtum's theory cannot be proved or rejected for recent period. However, Moullé's double view concept can be empirically observed.

As a next step of the research, a comparative study of borderlanders' and inlanders' view should be launched to test theories based on distance. Another fruitful way of creating a complex overview of border cognition is sampling of inner borders of the European Union. To shadow this picture, Schengen (e.g. Hungary-Romania or Hungary-Croatia) and non-Schengen (e.g. Hungary-Austria or Hungary-Slovakia) borders can be confronted. Such a research could depict the validity of the full theory of cognition of different European borders.

## References

- Akcali E (2010) Reading the Cyprus Conflict through Mental Maps. An interdisciplinary Approach to Ethno-Nationalism. In: Guelke (ed) *The Challenges in Ethno Nationalism*. Palgrave-Macmillan, New York, 41-59.
- Balázs B, Farsang A (2016) A szegedi középiskolások országhatár-képzete Magyarország délkeleti határáról. *Földrajzi Közlemények* 140(3): 258-269.
- Basilien-Gainche ML (2015) The EU External Edges: Borders as Walls or Ways? *Journal of Territorial and Maritime Studies*, 2(1): 97-117.
- Beauguitte L, Didelon C, Grasland C (2012) Le projet EuroBroadMap. Visions de l'Europe dans le monde. *Politique européenne* 2012/2(37): 156-167. DOI 10.3917/poeu.037.0156
- Cierco T, Silva JTD (2016) The European Union and the Member States: two different perceptions of border. *Revista Brasileira de Política Internacional*, 59(1): e003. DOI: 10.1590/0034-7329201600103
- Csépe V, Györi M, Ragó A (2011) *Általános pszichológia*, vol 2, Tanulás-Emlékezés-Tudás Humán környezeti kogníció eligazodás, úttalálás a térben. Budapest, Osiris.
- Downs RM, Stea D (1973) Cognitive maps and spatial behavior: process and products. In: Downs RM, Stea D (ed) *Image and Environment*, Aldine, Chicago, 8-26.
- Dimitrovona B (2008) Re-Making of Europe's Borders Through the European Neighbourhood Policy. *Journal of Borderlands Studies*, 23: 53-68.
- Didelon C, de Ruffray S, Boquet M, Lambert N (2011) A World of Interstices: A Fuzzy Logic Approach to the Analysis of Interpretative Maps. *The Cartographic Journal*, 48(2): 100-107.
- Eden C (1988) Cognitive mapping *European Journal of Operational Research* 36, 1-13.
- Gold JR (2009) Behavioral Geography. In: Kitchin E, Thrift N (eds) *International Encyclopedia of Human Geography*. Amsterdam, Elsevier, 282-293.
- Györffy E (2016) Mental mapping in socio-onomastics. *Rivista Italiana di Onomastica* 22(1): 65-78.
- Hirtle C S, Jonides J (1985) Evidence of hierarchies in cognitive maps. *Memory & Cognition* 13(3): 208-217
- Houtum HV (1998) The Development of Cross-Border Economic Relations. ThelaThesis, Amsterdam.
- Houtum HV, Naerssen T (2002) Bordering Ordering and Othering. *Tijdschrift voor Economische en Sociale Geografie*, 93(2): 125-136.

- Houtum HV, Laine J, Scott JW (2016) EUROBORDERSCAPES – Potentials and Challenges of Evolving Border Concepts. In: Scott, JW (ed): *Cross-Border Review*, European Institute of Cross-Border Studies – Central European Service for Cross-Border Initiatives (CESCI), Budapest, 135-152.
- Kiss J, Bajmócy P (1996) Egyetemi hallgatók mentális térképei Magyarországon. A mental map-ek módszeréről. *Tér és Társadalom*, 10(2-3): 55-68.
- Kitchin R (1994) Cognitive maps: what they are and why study them. *Journal of Environmental Psychology*, 14: 1-19.
- Kitchin R (1996) Increasing the integrity of cognitive mapping research: appraising conceptual schemata of environment – behaviour interaction. *Progress in Human Geography* 20(1): 56-84.
- Letenyei L (ed) (2005): *Településkutatás I. egyetemi jegyzet*, Ráció Kiadó, Budapest.
- Letenyei L, Morauszki A (2015) Indicators of Cross-Border Impact: Mental Mapping, Position-generator and Language Skills, *Cross-Border Review*, 2015(1): 97-108.
- Lynch K (1960) *The Image of The City*. MIT Press, Cambridge.
- McKenna J, Quinn RJ, Donnelly DJ, Cooper AG (2008) Accurate Mental Map as an Aspect of Local Ecological Knowledge (LEK): a Case Study from Lough Neagh, Northern Ireland. *Ecology and Society* 13(1): 13.  
<http://www.ecologyandsociety.org/vol13/iss1/art13/>
- Mishra A, Mishra H, (2010) Border Bias: The Belief That State Borders Can Protect Against Disasters. *Psychological Science* 21(11): 1582-1586.
- Moullé F (2013) La frontière et son double. Un modèle à partir de l'expérience européenne. *Belgeo*, 2013(1), <http://belgeo.revues.org/10620>; DOI: 10.4000/belgeo.10620
- Michalkó G (1998) Mentális térképek a turizmus kutatásban. *Tér és Társadalom* 12(1-2): 111-125.
- Newman D (2003) On borders and power: A theoretical framework, *Journal of Borderlands Studies*, 18(1): 13-25. DOI: 10.1080/08865655.2003.9695598
- Paasi A (1998) Boundaries as Social Processes: Territoriality in the World of Flows, *Geopolitics*. 3(1): 69-88.
- Ratti R (1993) Spatial and Economic Effects of Frontiers. Overview of Traditional and New Approaches and Theories of Border Area Development. In: Ratti R, Reichman S (eds): *Theory and Practice of Transborder Cooperation*. Helbling & Lichtenhahn Verlag, Basel-Frankfurt am Main, 23-53.
- Renard JR, Picouet P (1993) Frontières et territoires. *Documentation photographique*, 7016
- Rosière S, Jones R (2012) Teichopolitics: Reconsidering Globalization Through the Role of Walls and Fences, *Geopolitics*, 17(1): 217-234.
- Razac O (2013) La question de la perméabilité. *L'Espace Politique*, 20(2). URL: <http://espacepolitique.revues.org/2711>; DOI: 10.4000/espacepolitique.2711
- Scott JW (2009) Bordering and Ordering the European Neighbourhood: A Critical Perspective on EU Territoriality and Geopolitics. *TRAMES: A Journal of the Humanities & Social Sciences*, 13(3): 232-247.
- Senge PM (1994): *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization*. Doubleday, New York.

- Sulsters WA (2005) *Mental mapping, viewing the urban landscapes of the mind*. University of Delft, mimeo.
- Székely A, Kotosz B (2005) A határmenti lakosság határképe az EU-csatlakozás előtt. *Statisztikai Szemle*, 83 (12): 1111-1129.
- Székely A (2013) Border Region Structures. *Analecta Technica Szegedinensia*. 2013(1-2): 64-70.
- Székely A (2017) *La coopération transfrontalière entre la Hongrie et les Etats limitrophes* Éditions universitaires européennes, Saarbrücken.
- Tolman EC (1948) Cognitive Maps in Rats and Men. *Psychological Review* 55: 189-208.
- Yndigegn C (2011) Between debordering and rebordering Europe. Cross-Border Cooperation in the Oresund region or the Danish-Swedish Border region. *Eurasia Border Review* 2(1): 47-59.
- Uszkai A (2015a) Európai országgép kutatások a mentális térképezés módszerével. In: Karlovitz JT (ed): *Fejlődő jogrendszer és gazdasági környezet a változó társadalomban*. International Research Institute, Komárno, 95-101.
- Uszkai A (2015b) Fizikai és mentális határok a társadalmi térben, a mentális térképezés elméleti háttere és gyakorlati kutatásai. In: Hardi T (ed) 2015 *Terek és tér-képzetek*. Fórum Kisebbségkutató Intézet – MTA KRTK Regionális Kutatások Intézete, Somorja-Győr, 155-164.
- Wills ER (2016) Constructing a “Wall”: Discursive Fields, Social Movements, and the Politics of the [Wall/Barrier/Fence]. *Journal of Borderlands Studies*, 31(3): 305-318. DOI: 10.1080/08865655.2016.1174596