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Cognitive maps and toponyms in a broadening geographical horizon[1]

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Abstract: In today's modern societies human horizons have expanded significantly due to improving transportation opportunities, education, and the media. Therefore, we now have direct and indirect knowledge even about other continents and far-away regions. At the same time, however, due to the changing lifestyles resulting from the wide-ranging use of technological devices, the majority of people have moved further away from nature and the surrounding geographical landscape. Daily life is connected to residential areas, most people have little knowledge of the outskirts of settlements, and on our cognitive maps the border is mostly incomplete and full of white spots; in relation to this, the onomastic corpus we are aware of has a different composition in terms of the proportion of various toponyms compared to one or two hundred years ago. In my paper, I discuss how changes in lifestyle and globalization affected the organization of the cognitive map and as a part of it, people's knowledge of place names.
Keywords: cognitive map, globalization, place-name knowledge, traditional societies, modern societies.

1. Globalization

Many argue that globalization is not a new phenomenon, we may identify its antecedents as early as the 13th century: this is when the Hanseatic League was established connecting the commercial towns in Northern Europe and the Baltic region. Discoveries in the 15th and 16th centuries and the establishment of colonial empires along with the industrial revolution have also played a crucial role in the intensification of social contacts. Still, we tend to talk about globalization from the second half of the 20th century, when with the development of technology and means of communications real and virtual networks have come to link the economies, societies, and cultures of all countries in the world.

Manfred Streger has recently emphasized that "globalization processes do not occur merely on an objective, material [economical, political] level but they also involve the subjective plane of human consciousness" (2013: 15). One of these aspects

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is how humans represent space. In my paper, I discuss how changes in lifestyle and globalization affected the organization of the cognitive map and as part of it, people's knowledge of place names. I focus on two distinct cultural groups: modern western societies and non-western, traditional cultures.

2. The spatial mental model

Cognitive psychology assumes that our minds map the narrower and broader spatial environment surrounding us. The organization of these spatial representations is referred to as the cognitive or mental map,[2] spatial mental model. This helps our orientation in space. At the same time, the cognitive map (contrary to its name) does not have the same structure as real maps. It is, on the one hand, more complex: besides spatial knowledge in the narrow sense of the expression, it also stores other information (memories, emotions) about places. On the other hand, it is also more deficient: there are a lot of blind spots on it, yet thanks to the functioning of our mind (cf. Pléh 2003) it works as a coherent spatial model.

The building of spatial representations is partly biologically-driven[3] but individual experience also plays a key role (i.e., the cognitive map is subjective) and thus it may also be perceived as a continuous learning process (it is dynamic). At the same time, the individual is always a member of the community and the spatial knowledge of the members of given groups, cultures is similar due to the similarities of the geographical environment and lifestyle. Speech also has a central role in that it approximates the individual cognitive maps. This is because besides physical perception, linguistic stimuli also contribute to the creation of spatial representations.[4] The individual grows

[2] In cognitive psychology both terms are used to refer to the spatial representations of the outside world that is kept within the mind. In geography, however, *mental map* is often determined as an actual manifestation (usually a drawing) of this perceived knowledge (for the terminological issues see Kitchin 1994: 1–5).

[3] Object permanence is an important ability to hold objects in mind when they are not physically present. Cognitive mapping is the umbrella term for the abilities of spatial orientation on larger scales which makes humans and animals able to accumulate spatial information about previously unknown territories quickly and use them flexibly. These conditions (Piaget has called perceptional space, Piaget and Inhelder 1956: 3–43) are rooted in sensorimotor intelligence and allow successful actions but do not imply any reflections (Schemmel 2016: 6, cf. Csányi 1994; for a critical discussion of comparisons between animal and human spatial cognition, see Hazen 1983).

[4] What makes human spatial cognition so special is that it implies representations that go beyond those closely tied to the given action and perception (representational space, Piaget and Inhelder 1956: 3–43). It depends on the uniquely human ability of social cognition which implies that humans are able to communicate, to share knowledge, and to learn from each other. Human cognitive maps can be constructed without direct experience. Sharing knowledge is based on intentionality, i.e. a basic human ability to understand conspecifics as intentional beings. In order to communicate about space, „human children must learn to adopt the perspective of others" (Schemmel 2016: 11, cf. Tomasello 1999: 26–55). „In this way the mental models of space themselves become part of an evolving culture, accumulating collective experience

up in a way that s/he also hears discussions about space. Certain spatial information becomes known to us only by means of linguistic mediation and the knowledge processed this way is also integrated into the mental map of the individual. Studying contemporary circumstances, we may say that the role of secondary information and indirect learning increases proportionately with the growth of the represented area, we rely more on texts, images, maps, and media information (Evans and Garling 1991). Due to this secondary information, the cognitive map is not limited to finding our way and orientation, but it may be interpreted as a more general cognitive and symbolic set of knowledge (Dúll 2007: 140; Kitchin 1994).

3. Traditional societies

In the case of traditional societies, the geographical environment is an integral part of life: for groups with a nomadic and semi-nomadic, gathering, hunting, fishing lifestyle the awareness of the geographical (biophysical) environment is of fundamental importance. However, their spatial knowledge is limited from another respect, as they have little or no knowledge of areas from beyond their own experience or that of the community. For example, the geographical knowledge of the Australian Eipo people living in an area abundant in mountains extends to an area that may be covered with three days of fast walking (Thiering and Schiefenhövel 2016: 63). This area is significantly larger in the case of nomadic people: it may extend from tens to hundreds of square kilometers (Harari 2019: 55; Whallon 2016). The lifestyle of the community and the natural conditions are both crucial in this respect.

They practically know their area to the smallest detail. Usually, the life of nomadic people is characterized by continuous wandering that is influenced by the change of seasons, the migration of animals, and the growth cycles of plants (Harari 2019: 55–56). The purpose of wandering is not only to acquire food and resources but the acquisition of knowledge is just as important. In order to survive, access to a detailed cognitive map of their area is a must (the same holds for traditional fishing societies, cf. Taha 2018; for other aspects see Whallon 2016). Members of traditional societies have a much more detailed, in-depth, and diverse image of their biophysical environment than people living in modern societies. In terms of orientation, besides the basic points of reference, they also heavily rely on other signals of their environment that may be recognized with their senses, including the movement of the sun, the direction of the wind, etc. (Hall 1995; Taha 2018: 492; Jarvenpa and Brumbach 2016: 20; Aporta 2016: 71–72).

Spatial knowledge is partly based on people's own experience. At the same time, tools typical of traditional societies, including a kind of imitative learning (demonstration, observation, imitation), are also important means of cultural knowledge transfer. It is not surprising that at times when researchers would like to find out how members

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over generations and becoming richer and more refined than any mental model a single individual could have produced" (Schemmel 2016: 12).

of a given community know which way they need to go, they get answers like: "My dad and my mum knew, we just followed them" (Henzi 2017: 63). Moreover, in language-based knowledge transfer, the role of narratives is also central. It is typical that the often repeated mythical stories, travel accounts of indigenous wandering peoples are built around places, points of orientation, and they use peculiar "pathway songs"[5] that tell stories involving different paths. These stories and songs are important tools of cultural and spatial knowledge transfer within the illiterate communities, and both the points of orientation and their place names play a significant role in the lives of the communities. Thus, for example, the ceremonial stories of the half-nomadic Navajo in North America include a kind of verbal map according to researchers, which identifies the routes, points of orientation, and cultural landmarks (Jett 2011: 327). According to anthropologists, these stories may not only work as maps, but they were actually used this way in the past (Francis and Kelley 2005: 98–99) and it was also observed in other nomadic and half-nomadic communities, cf. e.g. the Athabaskan in Alaska (Jett 2011), the Blackfoot in Northern Plains (Oetelaar 2016), the Igloolik in the Eastern Canadian Arctic (Aporta 2016; for a partly different way of place-name usage see also cf. O'Meara 2016: 145–146).[6] As part of these stories, names are like street signs and hunters and gatherers rely on them for orientation (Nelson 1983: 39). And as the spatial thinking of these communities is characterized by the close, almost inseparable link between the places and their names, they keep emphasizing the role of toponyms in orientation. The active fishermen of the Seri people in Mexico, for example, claim that they can find fishing places based on oronyms (as there are protrusions close to the shore) (Henzi 2017: 63). Traditional fishermen in Suakin (Sudan) also emphasize the importance of place names as tools for the identification of local landmarks, for route finding and estimating distances (Taha 2018: 492). The role of names in orientation in the mentioned communities is also reinforced by the fact that the names in question mostly describe the salient attributes of the place and the environment (e.g. *Shąąą´ą´ Tóhí* 'The Sunnyside Spring' in Canyon de Chelly, Jett 2011: 329, cf. Jett 1997: 487–489; in the case of the Western Apache, "place names implicitly identify positions for viewing these locations, optimal vantage point [...] from which the sites can be observed clearly and unmistakably, just as their names depict them" (Basso 1990: 155), e.g. *tse bika tu yahilii* 'water flows down on top of a regular succession of flat rocks', see also Schreyer 2006), and the places are characterized with the literal meaning of the name elements.[7] Nevertheless, anthropologists also emphasize the difficulty to classify them in thematic categories as these name forms are understood in much broader experimental and cultural contexts (cf. Aporta 2016: 80, 83).

[5] "Songlines allow the traveller to find the way by matching a rote-learned song with the scenery that unfolds while travelling" (Dwight and van der Leeuw 2015: 45).

[6] O'Meara (2016) has not identified a particular genre of place name narratives in Seri, but place names definitely play a role in telling local history and storytelling.

[7] The descriptive nature of indigenous place names led to the misconception that Native Americans did not have real place names (cf. Bright 2003: 674–676).

These toponymic systems are dynamic, just like people's and cultures' memory. And toponyms have the power "to trigger the memory of everything linked to the place and its surroundings: geographic information, information related to hunting and travelling, as well as information about humans, relatives and ancestors and other beings who live on the land" (Collignon 2011: 7, cf. Jarvenpa and Brumbach 2016: 20–21).

Members of nomadic communities left hardly any conspicuous material manifest of their presence in the landscape (cf. Lovis and Whallon 2016). Yet they transform the land, if only intellectually. It seems that place names play a role in it, they appear as mediators between land and the people, they are "one of the means through which the experiences of interactions with the land can be shared, and thus through which the land can be understood and become a human place" (Collignon 2006b: 200).

Due to the role of places and their names in the organization of the life of a community, it is very likely (although it definitely needs confirmation) that individuals' name awareness should be much more similar in these types of societies than in modern ones. However, we also need to consider the influential role of age, gender and the division of labor in this case as well (cf. e.g. Jarvenpa and Brumbach 2016: 28–29), but not to such an extent as in the settled communities. Studies in this regard are still lacking, even though they would be important also because globalization is increasingly present in these communities as well and soon we will not have the opportunity to conduct such studies.

Simultaneously with changes in lifestyle and modernization, it can be seen that in many communities name awareness is declining or is being restructured. For example, in the case of the Seri people in Mexico mentioned before, the former wandering, hunting-gathering lifestyle is gradually replaced by a lifestyle that involves settlement in villages, and instead of hunting, fishing becomes predominant; in relation with the changes in lifestyle and the living space, the young people barely have any knowledge of the former campsites and they do not even know the names of these places (Henzi 2017: 39, 87, 90; O'Meara 2016: 148). Researchers report similar findings in connection with the reindeer-herding Sámi people in Sweden, where with the spread of modern tools of traveling, the former micro-level points of spatial orientation are losing their significance, and thus the places and their names as well as the related knowledge are all forgotten. This process may be further accelerated by the fact that the means of transferring spatial knowledge is also changing, the use of digital maps is becoming more widespread than storytelling. Thus, the process of learning about and interpreting the environment, the former collective mapping is transformed more and more into individual information processing (cf. Cogos *et al.* 2017: 47–48).

As a result of globalization and the changing lifestyle, the horizon of these communities is widening. Béatrice Collignon compared the geographical knowledge of older and younger Inuinnaits (one group of Inuit, the Inuinnait of the Central Arctic). The elders (more than 55 years of age) have a very detailed mental map about their territory and a very weak knowledge about the settlement. But due to the fundamental difference between lifestyles, the geography of younger generations is very different from

their grandparents' knowledge. It deals with the entire world, not just with the land of the community, but it contains a simpler framework about their land. Geographic knowledge of young Inuinnait is not founded on the complete and complex system of their elders, they create their own mental map by themselves. It encompasses knowledge about three very different types of spaces: the land of their elders, settlement life, and the outside world (Collignon 2006a: 202). While the elders view the settlement as a marginal space, the younger generations, on the other hand, see it as the center of their territory because this is where they gained their experience; this is their reference space (Collignon 2006a: 193–206).

Based on the above-mentioned, we can conclude that globalization threatens the existence of traditional geography in these communities. Noticing this, both researchers and members of these communities consider it important that traditional spatial knowledge transfer and the knowledge itself survive in some form. At the same time, researchers emphasize that the real challenge is not to record and to map place names, but to find appropriate ways of preserving the power of the spoken word when it is translated in a written form, that is: of keeping naming a process, and landscapes a constant re-creation. Because it seems that writing place names on maps "tend[s] to reduce them to mere words, deprived of the stories and geographic knowledge that were imbedded in them […] when told (and not read)" (Collignon 2011: 7; Cogos *et al.* 2017; Vaarzon-Morel 2016).

4. Modern societies

With changes in lifestyle due to settlement, the structure of the people's spatial model has also partly changed: spatial orientation takes place more and more around fixed points in the environment. With settlement, people's mobility becomes limited, the size of the area known by them in detail is usually much smaller than in the case of traditional societies (cf. Dwight and van der Leeuw 2015: 46–48). At the same time, the proportion of artificial places and their proper name designations is becoming larger in the representation of space. The new forms of representation of knowledge, writing, the metric system, and maps resulted in a new level of accumulation of information, and at the same time brought about additional changes in the creation of the mental model of space (of course, for a long time this did not affect all the members of the community, only certain social layers).[8]

In correlation with globalization, in modern societies human horizons have expanded significantly due to the transportation opportunities available for everyone and we now have direct and indirect knowledge even about other continents and far-away regions thanks to education and the media. It is more and more typical

[8] One important step of this process was the systematic mapping of the world that started in the 16th, 17th and 18th centuries which resulted in a completely new perception of space, a perception not from the ground, but like from a bird's-eye view, essentially extending people's mental map. Maps could also contribute to the decrease in importance of place names (I would like to thank the anonymous reviewer for these ideas).

that beyond the environment known from people's own experience, information from other sources is also integrated into the cognitive map: with the growth of the represented area, we rely increasingly on texts, images, maps, media information. As a result, there is a fundamental difference between traditional and modern societies in terms of the amount of information included and area covered by the cognitive map. Traditional societies have a detailed spatial representation of their own areas and their spatial knowledge barely goes beyond it. As opposed to this, in modern societies, individuals have some kind of a sketchy image and basic information of the entire world, and they are also well aware of their direct (mostly urban) environment.

Due to the changing lifestyles resulting from the wide-ranging use of technical devices, most people have moved away from nature and the surrounding geographical landscape. The knowledge about the land, its topographic and geomorphological features, and the availability of natural resources does not necessarily survive. People do not have a very close and intimate relationships with the environment. Daily life is connected with residential areas, people generally have little knowledge about the outskirts of settlements, and on our cognitive maps the border is mostly unfinished and full of white spots (cf. Reszegi 2018; Győrffy 2018: 66).

As a result, most people also have a limited knowledge of toponyms and the known onomastic corpus has a different composition in terms of the proportion of various toponyms than in traditional communities or one or two hundred years ago. As revealed by the most recent studies in Hungarian socio-onomastics, the names known by everyone represent only 1–5% of the total onomastic corpus of a given settlement even in the case of smaller villages. Although in terms of the core onomastic corpus (those names that are known by at least 70% of respondents) this proportion is significantly higher (30–64% in the examined settlements), these are mostly name forms related to inner areas, which designate more important, central places (Győrffy 2018: 98). It is obvious, however, that besides the onomastic corpus of their own place of residence, people have knowledge of numerous other places and their names, and these also form a part of their cognitive maps and the sub-network of toponyms (Reszegi 2015).

Globalization, the extension of human horizons, exerts its effect from childhood, from the beginning of the construction of individual cognitive maps. In western societies, in addition to the names of people's own places of residence, names of continents and countries are among the earliest toponyms learned by children (the toponymic lexicon of my three-year-old daughter contained street names: *Sinai Miklós utca, Darabos utca, Damjanich utca,* names of towns: *Debrecen, Radvány, Nánás, Budapest, Gyula, Sárospatak,* countries: *Magyarország* 'Hungary', *Svájc* 'Switzerland', *Hollandia* 'the Netherlands', *Németország* 'Germany', continents: *Afrika, Európa, Dél-Amerika* 'South-America' and other macrotoponyms: *Balaton, Duna* 'Danube'; Reszegi 2015, 2016, cf. Lambert and Wiegand 1990, Palmer 1994: 150). And although the interpretation of the geographical environment of a larger scale and its representation similar

to that of adults is the result of a long developmental process, in the aforementioned societies education, mass media, traveling, etc. also reinforce this comprehensive view of space.[9]

At the same time, it is also clear that the cognitive map built this way is not equally detailed in terms of every area. We obviously have the most accurate and detailed representation of our own place of residence and the areas visited regularly on a daily basis. A significant part of toponyms we know may also be linked to these areas. The names in question might be connected with and evoke personal or cultural memories but usually they are not embedded in such a complex narrative system and do not have so extended representations as place names of traditional societies. The representations of places encountered during travels are also relatively detailed on our cognitive map. However, as shown by research in tourism geography, the mental representation of a given place is organized differently on the cognitive map of locals and tourists, as they distinguish different points of reference, boundaries, etc. (cf. e.g. Aubert 2014). In relation to this, the name awareness of locals and tourists regarding the area is also different. At the same time, the spatial knowledge deriving from secondary sources is obviously more schematic, since they derive from collective knowledge (the role of collective value judgements, stereotypes).

It seems that the information content of the cognitive map and in relation to this name awareness may also be characterized with the features of scale-free networks. The most extensive and abundant information comes from people's own settlement of residence, and this is the most diverse as well. The cognitive map and the onomastic corpus are much less detailed in the case of a larger area (country or region), but overall we store a similar amount of information on this scale to that found on the previous one. These pieces of information, however, do not cover it in as much detail due to the size of the area; practically it features only the larger geographical objects, cities, and their names, along with some smaller objects and their names (that are significant culturally or based on one's experience). On the level of continents, typically only countries, capitals, major cities, geographical sites, places of cultural, economic or touristic significance are stored along with their names.

Conclusions

Our age is referred to as the age of globalization, which affects every aspect of people's lives, even within cultural and environmental spheres. Space and its perception are also going through changes (increasing abstraction and virtualization of space, its consumption, etc.). A degree of uniformization characterizes the mental maps of people living in modern societies: the spatial mental model of different peoples exhibits numerous shared marks in terms of structure and content. Due to changes in lifestyle, the spatial knowledge of traditional societies is also changing. One (so far not studied)

[9] For more details regarding children's environmental or spatial development see Palmer (1994), Stea *et al.* (2000), Skelton *et al.* (eds.) (2016).

unique consequence of this is that the toponymic model, people's name competence, is also undergoing transformation. It is a basic feature of western societies (although there are significant individual differences in this regard) that toponyms are treated as labels, as mere referential elements, whereas analytical name usage, highlighting the motivation of name-giving, is declining. In these societies, speakers have an experience of toponyms according to which the non-transparent name forms are present in the name system in to a larger extent. Besides, during their linguistic socialization, individuals soon realize that transparent names do not necessarily reflect the features and nature of the landscape. Based on such experience, the name user considers the identifying function of names to be dominant, and the linguistic structure and the comparison of the semantic content of the name elements and the actual landscape seem less important (cf. Reszegi 2018). In the case of traditional societies, the name users are socialized by experiencing that toponyms provide actual information about the landscape and they are not only non-transparent designators of the place. This results in a more analytical processing of the names (cf. Reszegi 2018). However, as I have already shown, due to a change of lifestyle that also affects spatial socialization, the spatial knowledge of these communities is becoming more like that of modern societies, and this also affects the attitude towards names and the functions associated with names.

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