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Behavioural Geography and Countryside: Disadvantaged and Rural Areas in the Cognitive Maps of Hungarian Secondary School Students

Abstract

The present paper aims to measure the degree to which secondary schools target socio-economic and regional characteristics of disadvantaged (mainly rural) regions. Another important goal is to ascertain what other factors influence the cognitive spatial perception of secondary school students, especially concerning disadvantaged/rural areas. A significant methodological element for this is the examination of the geography curriculum as a secondary source. Regarding methods based on primary sources, a questionnaire survey reveals the general conceptual knowledge of one hundred and sixty students concerning the above issue. A section of the students involved in the investigation studies in secondary schools of a county seat and the other section in a small town. The investigation aims to encourage the implementation of goals outlined by frame curricula and

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in the list of prerequisites for obtaining a secondary diploma by conceptualising a methodological modification. The results confirm that the examined topic fails to gain significance in both primary and secondary education. Targeting the issue of disadvantaged areas in a separate chapter or making it a more remarkable factor among the list of prerequisites would strengthen topographical and conceptual skills. Students would be able to gain an insight into the regional characteristics of socio-economic inequalities during academic breaks by taking part in educational trips, field research or visiting disadvantaged areas.

Keywords: cognitive map, disadvantaged area, teaching geography

1. Introduction

Since the introduction of behavioural geography, a growing interest in subjective environmental cognition is discernible in papers dealing with sociology. From the 1960s onwards, more and more researchers have addressed the question of cognitive mapping. A critical approach to relevant papers revealed numerous problematic aspects of cognitive environmental perception. Knowledge acquired by members of the age group in question – 14 to 16 years – entails little geography-related content but rather seems to display stereotypes. We also claim that the degree to which geography-related parts of curricula contribute to how students construct their cognitive maps is not sufficient.

Even though the first Hungarian initiative addressing cognitive mapping was proposed by Zoltán Cséfalvay, the term itself was coined by an American psychologist, Tolman (Lakotár, 2004). Tolman (1948) sought to make sense of mental processes. This was the time when his famous experiment made him popular: he placed rats in a maze to examine their behavioural patterns and attempts to find the way out. He pointed out that rats construct a certain type of cognitive map when they try to find the right way.

The cognitive map of the individual undergoes a permanent transformation. From time to time, it gets reshaped by new experiences and pieces of information – its relation to the world does not cease to change (Lakotár, 2012). Geography is the kind of school subject that generally addresses the question of the objective environment. These are the classes that allow

us to improve students' spatial intelligence and fill their ever-increasing cognitive maps with geographical content.

The most general type of geography-related inequality is poverty. However, the question may arise as to how it relates to the problem we have just outlined. Today, more than 10% of Hungary's residents are experiencing poverty. Even though the Hungarian Central Statistical Office's relative at-risk-of-poverty rate displays a decreasing tendency, a more in-depth examination of the problem cannot be overlooked. The most important responsibility of teachers is to sensitise future generations to this issue.

The present paper focuses on disadvantaged areas. It investigates how secondary education addresses the social, economic and settlement-related impacts lagging regions experience. Although the Hungarian National Core Curriculum (NCC) expects schools to cover the topic, it does not detail how to implement teaching: "The goal of teaching geography is – by introducing students the geographical causes and possible socio-economic consequences induced by social and regional inequalities – to make students develop an empathetic, problem-solving attitude and a faculty to debate during measuring arguments against one another. By the end of the educational stage, students will have been able to demonstrate the causes and impacts of regional differences experienced in Hungary and to conceptualise possibilities for social inclusion" (Government of Hungary, 2020).

Since the change in the economic system, dealing with this issue has become indispensable in Hungary because inequalities between the economically developed and disadvantaged areas are persisting and solidifying. If the severity of social, economic and regional issues remains unaddressed (even in secondary education), then future geographers will fail to recognise adequately how it inhibits socio-economic cohesion. Consequently, instead of getting gradually eliminated, the aforementioned instances of inequality will further deteriorate in the future.

The general goal of this analysis is to reveal the conceptual and topographical knowledge of the disadvantaged and crisis areas among secondary school students and identify the factors responsible for the development of students' cognitive maps. We hence need to outline a methodological proposal concerning teaching geography involving a more efficient implementation of the goals outlined in frame curricula and among the list

of goals and prerequisites for obtaining a secondary school diploma. The present paper achieves this general goal through the following subgoals:

- The paper investigates how the focus of existing literature on cognitive maps has altered from the fall of Communism to the present day, to illuminate how the goals of the present paper fit the earlier research.
- The research seeks to ascertain the factors that contribute most to the development of the students' cognitive map.
- It also seeks to demonstrate how students of secondary schools conceptualise components of disadvantaged areas and the diachronic changes these components have undergone during the educational stage in question. We must devote special attention to the existence and alteration of personal experience, preferences and dispreferences, both generally and thematically.
- Another research objective is to provide insight into the topographical knowledge of high school students regarding the areas that benefited from the viewpoint of regional development and crisis areas.

2. Literature Review

Though behavioural geography gained significance in Hungary only after the change of the economic system in the 1990s, numerous papers have analysed cognitive maps before. The spreading of the behavioural revolution shed light on the importance of subjective spatial perception, of which the most fundamental premise is that human deeds are influenced by how their agents perceive their environments, rather than by the objective structure of space (Kiss & Bajmócy, 1996). Cognitive mapping is an interdisciplinary domain located at the intersection of geography, sociology, psychology and sociopsychology. The concept is not identical to mental mapping because the latter covers a narrower topic due to its being based on cognitive maps. Mental maps stand for representing the subjective reinterpretations of the spatial world: in short, a display of cognitive maps (Michalkó, 1998). Cognitive mapping is the experience-based blueprinting of the outer world, the result of which is the cognitive map itself. Cognitive maps are self-made maps of the individual consisting of his/her own knowledge, opinions and stereotypes (Garda, 2009).

In recent years, surveys have devoted special attention to cognitive mapping trying to ascertain the factors contributing most remarkably to the conception of mental maps. Lapon et al. (2019) sought to uncover the degree of correspondence between the place of residence, educational background and individual cognitive maps. Numerous papers have addressed the problem of cognitive mapping in Hungary as well, some of which focus on the mental map of Europe and others on European countries, Hungary in general or individual regions and local settlements within Hungary. Several articles deal with the methodology of teaching geography, the attitudes of students and the social-geographical significance of cognitive mapping, even in the present journal (Enyedi & Pál, 2021; Kapusi, 2021; Molnár, 2022; Schlachter & Teperics, 2022).

Notably, the 1997 survey by Bajmócy and Csíkos examined youngsters (in public and higher education). It measured the degree of popularity the students of Hungarian universities assign to other European countries. The study gained relevance back then due to Hungary's preparations for joining the European Union. The circumstances posed the question of what image undergraduates – potential EU citizens – construct about other member states of the Union. The study further underpinned the existing dichotomy between the East and the West, as well as stereotypes and aversion felt against some of the neighbouring countries of Hungary.

The research of Csapó and Cs. Czachesz (1993) is similar to the previous one, except for its main focus being on European primary and secondary schools and the intercultural attitudes their students display. Target groups of the survey involved eighth- and twelfth-grade students from each country under scrutiny. The results of the survey hardly differed from those of Bajmócy's and Csíkos, indicating that the most remarkable factor in constructing attitudes about particular countries is secondary school education.

The 2012 study of Makádi scrutinised the attitude of secondary school students towards Europe. Modifications made to the 2010 version of the Core Curriculum gave the study contemporary relevance. The new version of NCC enabled researchers to pinpoint the deficiencies in geography-related education, providing an opportunity for further modification while constructing local curricula or writing new textbooks. All things considered, knowledge acquired by students entails little geography-related content but seems to display stereotypes (Makádi, 2012).

Alpek and Tésits (2017) – as an immediate reaction to the United Kingdom's leaving the European Union (Brexit) – examined the general and topographic knowledge as well as the opinion of twelfth-grade students on the EU. They found that the appearance of settlements on the mental maps of students depends on diverse factors: partly on the size of the country in which they are located and partly on how distant they are from Hungary. The Baltic States, for example, appear on students' mental maps as blindfolds. There was general agreement on the assets and liabilities of the EU.

Apart from focusing on Europe, numerous researchers studied mental mapping vis-à-vis Hungary. Kiss and Bajmócy (1996) expected university students to contrast their mental maps with the real map of Hungary. They also sought to reveal the factors contributing to the conception of subjective maps, as well as the spatial elements these representations entail. They found that the mental maps of university students are dominated by economically developed cities while disadvantaged areas are rather underrepresented thereon. Locations generally perceived as tourist destinations were also strongly represented. They identified a significant correlation between the *image* of a particular location and its frequency of occurrence on mental maps. The more positively a particular location was perceived, the more frequently it appeared in mental images. All things considered, the study proved to be rewarding enough to be drawn upon in fields of geography teaching, regional development and tourism.

Researchers have addressed the cognitive mapping of the countries neighbouring Hungary and sharing borders with it. Lakotár (2004) outlined what cognitive image primary and secondary school students of Hungary construct about neighbouring countries as potential EU citizens. Hungary's joining the EU provided contemporary relevance to the investigation. It further confirmed the conclusion, by then well established, that cognitive maps are more influenced by the personal experiences, opinions and knowledge of the individual, as well as information gained from the media, than by knowledge acquired in school. Lakotár (2012) later applied an inverse logic to his research and examined the cognitive image of Hungary constructed by Hungarian primary and secondary school students living outside Hungary. Investigating the problem seems relevant, given that by then, most countries sharing a border with Hungary had already joined the EU. It can hence be inferred that in this case, students primarily drew upon their own knowledge and experiences.

Balázs and Farsang (2016) examined the mental images of secondary school students living in Szeged along the south-eastern border of Hungary and found that, apart from the objective lines visible on real maps, the human mind also displays a mental dividing line. They shed light on the limiting quality of the border – for the students in question, it is the border itself that inhibits the construction of a mental map, hindering students' distance perception and making it difficult for them to locate settlements.

The aforementioned studies comprise only a small fragment of the large body of literature in the field of cognitive mapping. Results of the accounts presented here – implying that the geography-related part of the curriculum still fails to contribute to the mapping qualities of students to an appropriate degree – underline the significance of further investigation.

Though proposals have been made concerning cognitive mapping, they have failed to address how students represent disadvantaged areas on their mental maps. The innovative characteristic of the present paper lies in its unprecedented interest in examining both the methods used in secondary education and their effectiveness in familiarising students with the concept of disadvantaged areas.

3. Methods

The present paper employs both primary and secondary sources. Dealing with secondary sources involves desk research of existing literature and documentary analysis (curricula and strategies of education policy).

Surveying existing literature represented the largest share of dealing with secondary sources. Papers were selected based on how they relate to geography as a school subject and to the field of geography in the context of cognitive mapping. Studies with either a geographical or sociological standpoint were selected to take hold of a diachronic account of the theoretical background the method is based on and to demonstrate its practical implementation. Geography as a school subject plays a remarkable role in developing one's ability to construct a mental map, which is why documentary analysis of secondary sources is based mainly on the National Core Curriculum (Government of Hungary, 2020), frame curricula (Educational Authority of Hungary, 2020), geography textbooks and atlases.

During the investigation, however, more emphasis was placed on primary sources, in the form of a questionnaire survey based on the

involvement of secondary school students. Two separate surveys were conducted, targeting ninth- and tenth-grade students between the ages of 14 and 16. The first, conducted in September 2019, was concerned with secondary schools located in Bonyhád, while the second, in April 2020, dealt with the ones in Pécs. These two settlements were chosen because their position in the settlement hierarchy, which is considered to be a factor of paramount importance. Participating institutions were differentiated based on their position in the settlement hierarchy – one county seat (Pécs) and one town (Bonyhád) – and their educational profile types (secondary grammar schools and secondary technical schools). The fact that geography, as a school subject, is taught in the first two years of secondary education was a crucial factor in deciding on criteria concerning age. The survey was restricted to a limited time that did not allow tracing the alteration of a particular class within two years; hence, only one ninth- and one tenth-grade class were selected from each participating institution. Ninth-grade students were expected to fill out the questionnaire at the beginning of the autumn term and tenth-grade subjects at the end of the spring term, making it possible to pinpoint factors that may have contributed to the construction of their mental maps in the intervening two years – in other words, whether students – similar to well-established inferences of existing literature – acquire knowledge mainly from their personal experiences, stereotypes and the media, or there is objective geographical content behind their answers. The survey results were categorised according to the types of participating schools. The research sought to illuminate how effectively the factor mentioned in the title of the present paper plays a role in teaching geography.

Thus, questionnaires were filled out by students of four secondary schools: Petőfi Sándor Lutheran Secondary Grammar School, Perczel Mór Secondary Technical School (located in Bonyhád), UP's Babits Mihály Secondary Grammar School and Pollack Mihály Secondary Technical School (located in Pécs). They had to answer the questions in their school classrooms, for which they were given the time of a full-length lesson. The task was carried out under a teacher's supervision. The headmasters of the individual institutions had approved the exercise earlier.

Subjects were randomly selected from the students of the participating schools. As per a previously approved scenario, each teacher handed out 20 sheets to the students – which adds up to 160 individual pieces – for

filling up which ninth- and tenth-grade students were given 45 minutes. The following table illustrates the structural distribution of the questionnaires.

Table I. Distribution of the questionnaires

Settlement	Type of school	Grade	Number of questionnaires
Pécs	Grammar school	9th grade	20 pcs
		10th grade	20 pcs
	Technical school	9th grade	20 pcs
		10th grade	20 pcs
Bonyhád	Grammar school	9th grade	20 pcs
		10th grade	20 pcs
	Technical school	9th grade	20 pcs
		10th grade	20 pcs
		Total	160 pcs

We found that the parents of students studying in either of the secondary grammar schools – in most cases – earned a university degree while parents of technical-school students were more likely to have a vocational degree. There is an easily discernible correlation between the type of institution and the parents' educational background; however, geographical data seems to have little significance in this respect. During the evaluation of the filled-out questionnaires, students' place of residence was considered an important factor, owing to its significance either to the disadvantaged position of the settlement or to students' perception of beneficiary regions during their contingent daily commute. According to our hypothesis, it may have a negative impact on how students evaluate disadvantaged areas. The most conspicuous crack in the tendency is displayed by the secondary grammar school located in Pécs. Here, the majority of ninth-graders (80%) and all tenth-grade students were city dwellers. Most of the subjects studying in the schools of Bonyhád, on the other hand, lived in small towns.

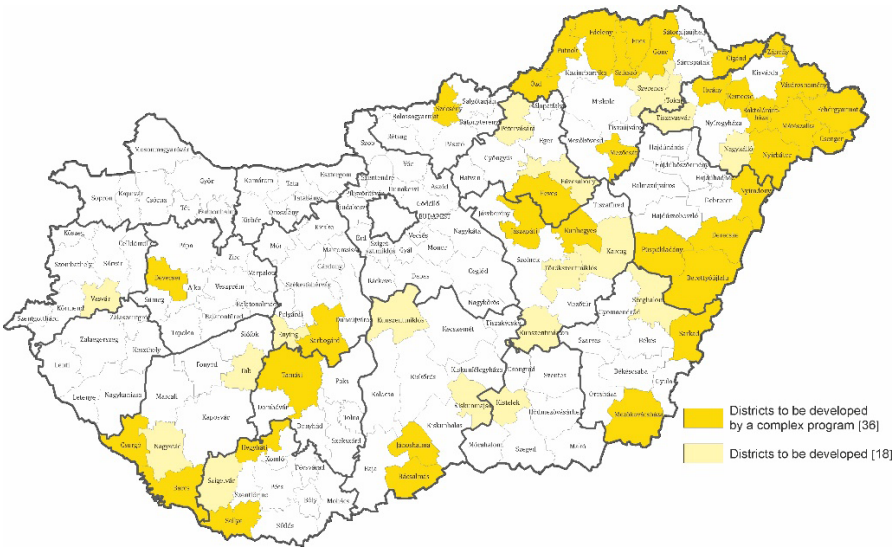
The primary sources we studied consisted of an outline map and the questionnaires. Students were asked to identify regions they deemed disadvantaged on a map displaying the borders of Hungary and those of

its districts. Though the outline map we handed out featured the borders of districts as well, it was only necessary for seamless analysis. We told students they were free to ignore the contours of districts on the map. Topographic awareness of districts cannot be expected even from students of this age. They either put an x on the region they deemed disadvantaged or shaded it. To define the concept of disadvantaged areas objectively, we examined districts awaiting general or complex development (Figure I). Figure I clearly shows that Hungary can be divided into three macro-regions in terms of socio-economic development. Besides the Budapest urban region, the dynamic areas connected to the global circulation are the western and northwestern counties and districts, which are close to the western inflow of foreign capital. In addition, they are characterised by more developed physical and human infrastructure, higher levels of qualification, and a historically higher rate of entrepreneurial activity. At the other end of the development spectrum are the peripheral areas, whose population is in a hopeless situation in many cases. These regions, mainly in the northeastern and eastern districts, are unable to catch up due to their location near the impassable border, and due to the previous, faulty regional and settlement development decisions, the settlement structure has small villages and a higher proportion of low-skilled labour force. The spatial structure is characterised not only by the East-West dichotomy but also, in a certain sense, by polycentricity, providing outstanding development opportunities to regional centers. Between the two extremes, one can see the semi-peripheries, the areas with an intermediate position in terms of socio-economic development.

To illustrate the answers, cartograms were made using a software named CorelDRAW 19. The frequency of occurrence of the particular answers was put into quartiles. Limit values were identical in each quartile.

The questionnaire addressed significant blocks of problems, one of which focused on conceptual elements: it revealed whether the subject had already encountered the concept of a disadvantaged area. The survey also investigated whether the subject had visited such a region and what he/she associated with the concept itself. It also measured their knowledge about the regions in question. Another block of problems concerned the aforementioned topographic exercise for measuring the subjective environmental perception of students.

Figure I. Beneficiary districts in Hungary according to Government Decree 290/2014 (XI.26.)



4. Results

4.1. Secondary school students interpreting conceptual issues of disadvantaged areas

4.1.1. The impact of formal education on conceptual knowledge

Sixty-nine percent of our subjects had already encountered the concept during either of their educational stages (primary or secondary education). While in the case of the secondary schools located in Pécs the impact of the intervening two years was discernible between ninth- and tenth-grade students, schools in Bonyhád demonstrated the contrary. The conceptual development of tenth graders is traceable in both the examined schools in Pécs because the curriculum for tenth-grade students incorporates the concept that is omitted from that of ninth-graders.

Students of the schools in Bonyhád were less likely to recognise the concept in either of the cases. A smaller proportion of tenth-grade students of these schools have encountered the concept, regardless of school type, which can be explained by the conceptual difference between the classes

in question, as the present research is not longitudinal. However, we must set aside the argument that classes may have acquired different levels of knowledge resulting from the different levels of competence their geography teachers acquired. Had we insisted on a follow-up method (that is, tracing the diachronic development of one particular class), the results must have been different. The type of school and geographical location seem to have a less significant impact on conceptual knowledge.

More than two-thirds of the subjects claimed to have heard of the concept during their studies at primary school. However, overrepresentation of the above educational stage may convey a false impression: subjects who have just started their secondary school studies are generally less likely to mark their secondary schools as an answer to the above question. Despite this, a more in-depth analysis of data shed light on the fact that a higher proportion of tenth-grade students chose the lower educational stage than ninth-grade students. From this, it can be inferred that the concept is already present in frame curricula designed for primary schools, both in direct and indirect forms.

Concerning the present subtopic, we deemed it necessary to investigate how the frame curricula of primary schools reflect the problem in question. The part concerning geography as a school subject sets the goal of familiarising students with socio-economic and environmental processes. An investigation of two broader topics in the geography textbook designed for seventh-grade students – titled *Geography of the Immediate Neighbourhood* and *Geography of Hungary* – allowed us to infer that curricula incorporate the concept of disadvantaged areas during this educational stage, in the context of the above topics. By the time students reach the end of the education- and pedagogy-related part of the former topic, they will have gotten to know the natural and social resources of their immediate environment and be able to describe and evaluate its geographical characteristics. They would also be able to account for the causes of problems rooted in geography and to identify the problems themselves. The topic titled *Geography of Hungary* sets the following goals: enabling students to systematise and classify and evaluate natural and socio-economic resources pertaining either to Hungary or the Carpathian Basin. Apart from this, by familiarising themselves with the above parts of the curricula, students would acquire skills to describe how the role and significance of natural and social resources change diachronically at

identifying differences in regional development; and they can also propose possible solutions and possibilities for development regarding the above aspects (Educational Authority of Hungary, 2020).

We deemed it important to examine the lessons in which the concept was mentioned. Students were most likely to pick the homeroom period (43%), followed by geography (15%), history (13%), Hungarian language and literature and then ethics (9%). There is a supposed correlation between the high frequency of occurrence geography gained and the fact that most of the form tutors teach geography in the examined institutions. Given the requirements in frame curricula and the few geography classes, it is much less surprising that the homeroom period is the most convenient for dealing with the question. A few students, however, recorded answers other than the field of studies listed so far, mentioning ethnology and ethnography, foreign languages, biology, information and technology, physics, math and theology.

As a supplement to the above results, we also examined how and where the National Core Curriculum (Government of Hungary, 2020) and frame curricula (Educational Authority of Hungary, 2020) address the concept of disadvantaged areas, and how they relate it to geography, history and ethics.

The second most popular answer was geography. In this content area, even NCC assigns special importance to describing causes and possible consequences of geographical phenomena induced by regional and social differences. Apart from this, NCC seeks to engage students in discovering, understanding and discussing socio-economic and environmental phenomena. It also encourages students to conceive a behavioural norm that displays tolerance and assumes mutual respect by familiarising students with up-to-date phenomena pertaining to social geography. How schools handle the problem acquires importance due to the inequalities experienced by various layers of society (Government of Hungary, 2020).

NCC-based frame curricula designed for tenth graders of secondary grammar schools also seek to enable students to describe and categorise particular types of settlements by grasping pieces of knowledge classified under the heading *Changing Settlements, Different Demographic Issues in the 21st Century*. Students should also be able to discuss the functional and structural changes the settlements underwent. Another goal is to make students understand and keep abreast of developments regions or settlements they witness in their neighbourhoods, as well as demographic

processes. By processing the topic titled *Hungary and the Carpathian Basin in the 21st Century* – apart from the outcomes listed above – students are enabled to define the causes and consequences of developmental differences between regions and to conceptualise possible solutions for promoting equal opportunities in lagging regions (Educational Authority of Hungary, 2020).

NCC-based frame curricula of secondary technical schools conceptualise the expected results students would have acquired after going through the part titled *Social Processes at the Beginning of the 21st Century.* They should be able to categorise settlements focusing on various aspects and to name specific examples of each category. Another expectation students should live up to is to contrast the ways and circumstances according to which people of different settlement types live their lives. They also should be able to differentiate between qualitative and quantitative dimensions of urbanisation and to understand their *inter se* relationship.

By investigating the topic titled *Values and Issues Concerning Socio-economic Characteristics of Hungary, Aspects of its Regional Peculiarities,* students are offered an opportunity to get to know the dominant socio-economic processes of present-day Hungary and to describe – through individual examples – how they affect socio-economic development (Educational Authority of Hungary, 2020). Based on the above pieces of information, it seems plausible that geography education, in numerous cases, is able to handle the concept under scrutiny both directly and indirectly.

To our great surprise, geography was closely followed by history (falling behind only by 2%) in the list of the most popular choices of participating students. This can be accounted for – making the fact less surprising – by the high proportion of teachers in the examined institutions who teach both history and geography. NCC (Government of Hungary, 2020) also aspires – within the content area of history – to make students construct an accurate and well-developed opinion on social, economic, political and cultural phenomena of the past and the present and to actively influence how these opinions change. Apart from the results listed above, students should also be able to interpret social relations and processes.

NCC incorporates secondary-school discussion of disadvantaged areas within the topic titled *The World in the 21st Century: The Changing World; The Global World.* One of the pedagogical and educational goals set by NCC-based frame curricula designed for secondary grammar schools is to

familiarise students with the characteristics of the multipolar world and to position Hungary within global processes (Educational Authority, 2020).

Contrary to what we have outlined so far, frame curricula designed for secondary technical schools aim to sensitise students to changes in their natural and social environment. Other subgoals involve making students learn the fundamental characteristics of society and economy and enabling them to identify ongoing historical change. They should also be aware that acquiring these pieces of knowledge is indispensable for them to make sense of underlying processes characterising present-day society, economy and politics.

The third most popular answer given by the students participating in the survey was ethics. Concerning ethics, NCC aspires to make students open-minded and helpful towards people in need (Government of Hungary, 2020). The frame curriculum designed for eighth-grade students uses this and incorporates familiarisation of students with socio-economic inequalities among its goals.

4.1.2. Knowledge of the concept based on own experience

We deemed it important to examine whether subjects have visited disadvantaged areas themselves, for personal experiences may have a significant impact on subjective environmental perception. We used a 5-point Likert scale for the survey, five representing frequent visits. The mean value of the answers was two, indicating that students have either not encountered disadvantaged areas or only passed through them. However, we chose to check our results by calculating the mode and median because the mean value of the answers proved to be unreliable in evaluating a Likert scale. Both approaches further confirmed the above conviction.

We cannot thus differentiate between the results according to factors concerning geographical location, type of institution and age. Deviation from the generally perceived tendency was displayed only by the secondary technical school located in Bonyhád, students of which claimed to have visited disadvantaged areas in the smallest proportion. Most of them, however, live either in small towns or villages, which seems to contradict this conclusion. The fact that one of the most urgent problems of Völgység is the overpowering presence of small villages bestows a rural character on the central region of the county. This implies that villages with small

populations located in this region (as is commonly known) are not classified under the heading of settlements displaying well-developed human and physical infrastructure. A geography teacher of the technical school in question also underlined that numerous members of the examined classes commute every day between Bonyhád and surrounding – presumably disadvantaged – villages.

The survey also investigated what students associate with the notion of disadvantaged areas. Answers to this question were diverse. We considered the ratio of positive and negative answers to be the most significant factor in evaluating the problem. Students were more likely to attribute disadvantageous qualities to the concept than appealing ones. Both economic and social problems – "poverty or financial difficulty, destitution, bad living conditions, unemployment, a high proportion of ethnic minorities, high crime rates and ghettos" – were represented among the collected answers. A few subjects considered disadvantaged areas in a more positive light: "large families sticking together, quiet and peaceful environment," etc. Such opinions appeared only in answers of students of secondary grammar schools (both Bonyhád and Pécs), perhaps because they may have little personal experience with the austere living conditions of the population residing in disadvantaged areas. City dwellers – overrepresented in secondary grammar schools as they are – are generally more likely to associate positive values with rural life. The socio-demographic background of students who study at the secondary technical schools in question are more diverse: parents of these students have various qualifications, ranging from vocational to university degrees. Fewer students had particular districts of their own settlement in mind upon encountering the concept. Examples of the latter include the slum of Szekszárd as well as Marótpuszta, Fehérhegy and Komló, from the perspective of students living in Pécs.

The survey also asked students to assign positive or negative adjectives to the concept of disadvantaged areas. Whenever we wanted students to associate lagging regions with positive adjectives, numerous questions remained unanswered. Highly frequent answers included "sticking together, humility, zealousness, healthy lifestyle, traditionalism and low house prices". Contrary to this, negative opinions were expressed by almost all our subjects. The most popular ones included "poverty, high crime rates, bad living conditions, high unemployment rates, starvation, underdeveloped infrastructural facilities, presence of ethnic minorities,

social discrimination, dingy areas strewn with rubbish, buildings in bad condition and prejudices". From all this, we can infer that most students have a negative idea about disadvantaged areas, and they – thanks to the lack of first-hand experience – are likely to conceive of stereotypes. Almost half of our subjects considered people living in disadvantaged dissatisfied with their lot; 39% of them held that they must have acquiesced to their living conditions; and less than 10% think that they are satisfied with their current situation. When we asked students to describe the clothing of people living in disadvantaged areas, mainly negative adjectives appeared like "shabby, beggarly, cheap, second-hand, inherited". Opinions on the behavioural patterns of people living in disadvantaged areas varied: students mainly assigned negative attributes to these residents. Answers often referred to these people as "abusive, aggressive, not being in accord with social norms". Less than 25% of our subjects used positive adjectives ("good-hearted, introverted, respectful, humble and kind"). These answers also prove that people are often full of prejudices concerning the residents of disadvantaged areas. Existing literature further stresses the fact that prejudicial attitude is influenced by two factors – educational background and cultural capital on the one hand and age on the other. In the case of youngsters, embedded emotions and behavioural patterns of the parents further complicate the picture (Murányi, 1999).

We gathered similar answers about the presumed financial and educational background of the residents of disadvantaged areas. Generally, people living in these regions have low-level education (only primary school level or a vocational degree) and barely get by, and are either unemployed or employed as low-paid casual or unskilled labour, or receiving money from benefits. Three separate types of opinions were represented on the traffic-related habits of residents of these areas, the most popular of which was going on foot, followed by riding a bicycle and traveling by public transport. Some of our subjects studying in Pécs also mentioned cheap cars as the means of transportation but this was much less characteristic of students in Bonyhád.

Youngsters studying in schools in Pécs had opinions on the family background of the residents of disadvantaged areas different from those who studied in Bonyhád. While only 1% of the latter expressed a positive opinion ("sticking together"), 5% of the former had positive ideas ("sticking together, everything for the family, helpfulness"). Less appealing answers

included "poverty, orphanage, bad parental example, lots of children and alcoholism".

Almost one-third of the participants failed to provide an answer concerning the social relationships of people living in disadvantaged areas. While one-third of Pécs students associated the problem with positive characteristics ("sticking together, great relationships, socially active, getting on well with one another and helping one another") only 8% of Bonyhád students had a positive viewpoint ("sticking together, helping one another, great relationships"). The rest of the students mentioned "discrimination, few and bad social relations, aloofness and narrow social network".

When participating, students asked to evaluate how residents of disadvantaged areas related to work were likely to focus on the domineering presence of unemployment among them. Students of secondary technical schools were more likely to mention the above concept – possibly owing either to family background (lower qualification) or place of residence (living in smaller towns or villages). The factors of geographical location and age seem to be irrelevant to the present question. Factory workers were also mentioned by the students of Bonyhád schools, perhaps due to the local enamel factory that has a significant role in employing a high proportion of residents with relevant qualifications. All the students expressed a negative opinion on the housing conditions of people in disadvantaged areas. Only ninth-graders studying in Pécs – and only 5% of them – recorded positive adjectives ("old but nice house, organised garden"). Answers with the highest frequency of occurrence include adjectives such as "profane, dingy, dilapidated, battered, small and cheap".

Apart from the above methods, we used a Likert scale to further illustrate the conceptual issue. Students were asked to evaluate prepared data concerning disadvantaged areas on a 5-point scale. From the mean, mode and median calculated from the answers, we inferred that subjects related the problem of disadvantaged areas mainly to the conspicuous presence of ethnic minorities. The assessed data also showed the overrepresentation of younger generations and the elderly among the answers. The latter mainly appeared in answers recorded by students from Bonyhád, while the former tendency was best discernible in the responses of students from Pécs (mainly in secondary grammar schools). All this may correspond to the perception of radically different demographic tendencies concerning smaller settlements in Hungary. The dominance of agriculture also scored

higher in the evaluation of all the schools we examined. In the latter case, students of secondary grammar schools were more likely to pick higher scores than those of technical schools. Positive characteristics ("friendly residents, nice-looking natural environment") were more easily discernible in the answers by the students of secondary grammar schools, perhaps due to the different approach students of secondary grammar schools took, compared to those of secondary technical schools – the former concentrating rather on natural beauty and recreational facilities.

Students were asked again (as in the previous case) to measure the severity of issues disadvantaged areas faced, on a 5-point Likert scale. Students in Bonyhád mentioned the dilapidated condition of houses followed by low levels of income and the lack and low standard of public facilities as the most significant issues. In contrast, opinions of students at Pécs considered low levels of income and education as the most salient issues, followed by the dilapidated condition of houses and the lack and low standard of public facilities. The mean value of these peaks was four while the mode and the median were both five.

Considering all these – as regards conceptual knowledge– students can be differentiated according to the type of education they are receiving, their family background and the type of settlement they live in. The geographical factor only affected how students perceived the social relations, family background and age structure of the examined regions. Based on the above examination, it can be concluded that students' knowledge entails little geography-related content and displays personal experiences rather than stereotypes.

4.2. Regional factors in subjective spatial perception

This chapter aims to (in a manner that first examines smaller and then larger territorial units – from settlements to macro-regions) reveal the sort of topography-related knowledge students of secondary schools have acquired about disadvantaged areas. The place of residence and its immediate environment are both overrepresented on the mental maps of the students. Residents of smaller towns were more likely to mark as disadvantaged regions around the southern border (Szekszárd, Tolna). This is somewhat less surprising because the slum of Szekszárd has already been strongly represented in connection with conceptual questions.

When we evaluated the markings at the level of counties, we found that the western and south-western parts of Baranya County (beneficiary regions on a legal basis) were usually selected as disadvantaged areas. However, it is still surprising that the results do not reveal financial differences concerning the county. Figures illustrating the data gained from the individual classes consider the neighbourhood of Pécs and Siklós as the most disadvantaged areas, probably due to students' propensity to associate smaller micro-regions of their own settlements with the concept itself. Distribution of the answers also shows how subjects are able to identify the geographical location of Ormánság and how they are aware of its disadvantaged status at the same time.

The underdeveloped status of north-eastern Hungary is still evident in the answers – especially in those from the students of secondary grammar schools. Ninth-graders were also likely to mark (but only less frequently) the western regions of Hungary as disadvantaged areas, probably due to their difficulties in interpreting the county-level thematic maps of Hungary featured by their atlases. They are also less sensitive to developmental differences within particular regions. The maps of tenth-graders also reflected the East-West dichotomy. Students were more likely to mark Szabolcs-Szatmár-Bereg county as disadvantaged than Borsod. This tendency probably corresponds to the memes and videos posted on social media because they make these lagging regions appear grotesque. The inner peripheries of Alföld were also marked as disadvantaged on the cognitive maps of the students.

In light of our results, we also deemed it important to measure the frequency of occurrence of answers concerning the heart of Hungary (Pest County). Surprisingly, mainly ninth-grade students marked the neighbourhood of the capital as disadvantaged. These answers much rather concerned regions close to the southern border of Pest County than inner peripheries, perhaps due to the less developed status of the northern regions of Bács-Kiskun County.

The results confirm that the topography-related development students in question undergo in two years (from the beginning to the end of studying geography in secondary schools). Consequently, apart from personal experiences, formal education also contributes to the improvement of one's mapping skills. A thematic examination of the results showed (presumably in an extraordinary way, characteristic of the present research) that the

students of technical schools have accumulated more accurate topographic data about disadvantaged areas, probably due to their teachers' intention to emphasise this methodological approach (Figure II–V).

The above results were further supplemented by the analysis of thematic maps either from geography textbooks or atlases. All the participating institutions use the books published by the Educational Authority of Hungary. We also compared the student world atlas published in 2010 (Balogh et al., 2010), with one published in 2021 (Balassa et al., 2021). An analysis of the figures in the atlases showed that maps that demonstrate data related to population geography feature even the borders of districts while maps concerning economic geography display only those of counties. While the former features borders dividing sub-regions, the latter uses a county-based layout. Although professional editors suggested that cartographers prepare maps featuring sub-regions, technical difficulties intervened. From the perspective of the present research, the most important factors the atlas lists were economic development, unemployment and industrial production. Students using older, patchwork-like illustrations were more likely to identify disadvantaged areas. Those thematic maps of the textbook designed for tenth-graders are more promising than the ones in the atlas because the former are mainly district-level maps. The most important indicators were the distribution of income, unemployment, sum of industrial production, *per capita* income (net) and GDP *per capita* (Arady et al., 2018).

Examination of the above tools showed that a superficial interpretation of text-book material on Lake Balaton – its status as a tourist destination is determined by weather – probably makes students consider its neighbourhood a disadvantaged area. Besides, the thematic county-level representation the atlas employs overlooks regional differences within the county. All this can imply that on the level of education, geography is able to illuminate the correlation between peripheries (inner and outer) and disadvantaged areas. Although age as a factor is important in differentiating results when examining the cognitive maps of city dwellers – for the examination of the figures in question – type of institution (family background, place of residence) plays a more significant role.

Figure II. Marking rate of disadvantaged areas in the 9th–10th classes of Bonyhád Vocational High School

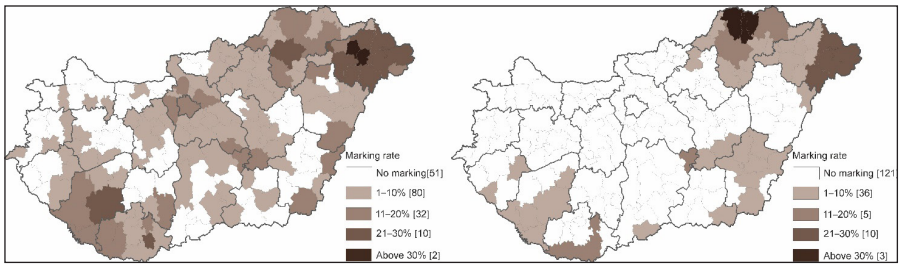


Figure III. Marking rate of disadvantaged areas in the 9th–10th classes of Bonyhád Grammar School

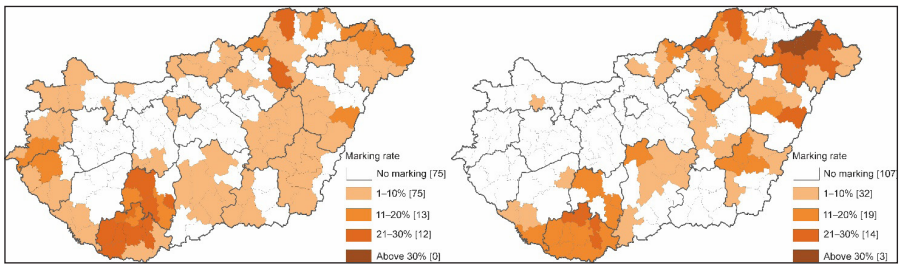


Figure IV. Marking rate of disadvantaged areas in the 9th–10th classes of Pécs Vocational School

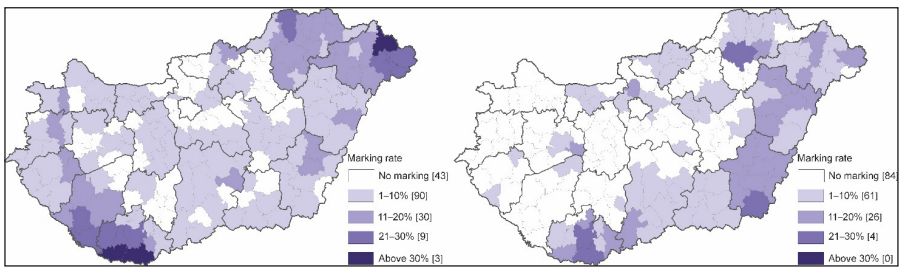
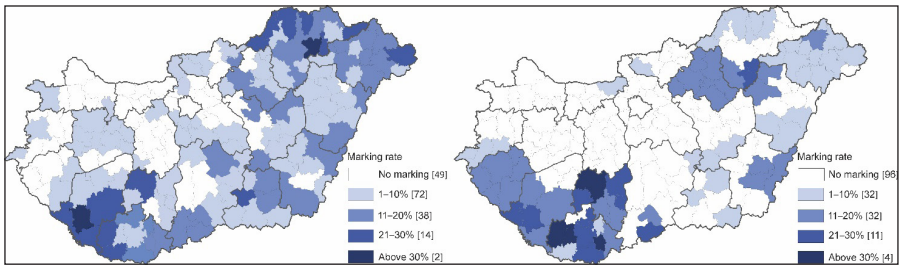


Figure V. Marking rate of disadvantaged areas in the 9th–10th classes of Pécs Grammar School



We highlighted the fact that the geographical factor (whether the school is located in a city or town) plays a less important role in categorising the mental maps of students than the type of institution and the particular grade they are attending. We also proved that ninth-grade students have not yet acquired sufficient topographic data about the concept of disadvantaged areas. Their answers can be best explained by their efforts to avoid making mistakes induced by high expectations. Tenth-graders displayed a higher level of awareness concerning disadvantaged areas, possibly because topography – unlike conceptual knowledge – presupposes a more practical type of knowledge.

5. Conclusions

We examined the subjective environmental perception of disadvantaged areas from three separate perspectives, viz. type of settlement (city or town), type of institution (secondary technical school or secondary grammar school) and age (ninth- or tenth-grade students). As regards conceptual knowledge, type of institution proved to be the most significant factor. The geographical factor only affected how students perceived the social relations, family background and age structure of the examined regions. We found that the knowledge students acquire from formal education entails little geography-related content and rather displays personal experiences than stereotypes.

The research shed light on the fact that differentiation between the cognitive maps of individual students is more a question of age and the

type of school students are attending than that of geography (the position of the examined settlements in the settlement hierarchy). The latter can be attributed to ninth-grade students having little topographic knowledge – essential for accurate identification – about disadvantaged areas. The cognitive maps of students displayed the main facts characterising the regional structure of Hungary (East-West dichotomy, inner and outer periphery and settlements displaying the features of small villages). Unlike the position in the settlement hierarchy and patchwork-like differences, the above factors are also represented in environmental cognition.

All things considered, we can infer that personal experiences and opinions, as well as information gained either from the media or platforms of social media, play a greater role in the conception of students' environmental perception than geography as a school subject. We should still target the problem either for the very reason we have just outlined or as opposed to it. The research shed light on the deficiencies that geography as a school subject still has. The curriculum covers only the problem under scrutiny in the tenth grade, and even then, it is embedded only in two subparts thereof. The list of prerequisites also fails to emphasise the problem adequately. Another issue is that technical programmes prescribe a lower number of compulsory geography classes per week. Possible solutions for the above issues entail devoting a separate chapter to dealing with disadvantaged areas and placing a larger emphasis on the problem in the list of prerequisites. For students to better understand the issues resulting from regional inequalities, the following can be implemented: extracurricular practicum, trips, occasional visits to disadvantaged areas and community service.

We revealed elements that geography as a school subject misses and conceptualised possible solutions through the method called cognitive mapping. We did all this simply to help students navigate the socio-economic processes that surround them. A better understanding of the relevant problems can prime social cohesion and inclusion in the future, even in one's immediate environment. However, for this betterment to take place, students should be more sensitive to the nature, appearance and causes of regional differences, and should recognise opportunities for change too.

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