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REASONS FOR AND OBSTACLES TO CYCLING IN OPINIONS OF RESIDENTS OF DEBRECEN, HUNGARY

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Abstract: *It is a basic aim of the European Union that due to the developments in 2014-2020 the bicycle would become one of the most often used transportation, touristic, and sports equipment. We were interested to see to what extent is bicycling present in the transportation system of Debrecen and what are the most important reasons for its residents to use the bicycles. The dedication of Debrecen to promote cycling is clearly proven by the number of newly built or resurfaced bike paths and by the fact that the University of Debrecen has introduced – alone in the region – UniBike which is a bicycle renting system brought forth by the need of its students.*

Here we present the developments that took place in the North Plain Region in the past few years. We have also analyzed the national and European strategies and reports on bicycling. A survey was conducted among the youth of Debrecen to explore their cycling habits. The data were evaluated using the EvaSys program.

Until the end of 2011 with the help of different funds 862 km of bike paths had been built in Hungary. In the North Plain Region due to funds totaling 777 million HUF 15.7 km long bike paths had been constructed until 2015. The development of tourism in this direction is promoted by the web-pages and brochures offering bicycle-tours around Debrecen. Nevertheless, bicycling in the neighboring townships is present not as an instrument for sports and/or tourism, rather as a mean of transportation.

It is a clear goal in Europe and thus in Hungary to have bike paths that can provide the means of safe cycling. In parallel, it is also important to promote the benefits of bicycling, including positive physiological effects, cost-effectiveness, and environment-friendliness to increase the proportion of those who select bicycling as an alternative.

Keywords: *bicycle paths, sport, transport, development, tourism, environmental benefits (JEL Code: I15)*

INTRODUCTION

Nowadays physical activity is proven to influence health condition favorably. A 30-minute, medium intensity sports activity per day reduces the risk of cardiovascular diseases, stroke, and type 2 diabetes (Warburton et al., 2006; Matthews et al. 2000). A wide scope study carried out in Copenhagen pointed out that regular, daily cycling significantly reduces the risk of the abovementioned diseases (Andersen et al., 2000). Several research studies have dealt with the important role that cycling plays in preserving health since the publication of these research results (for review see e.g. Veisten et al., 2011).

Several other studies describe the role and significance of cycling in the preference system of various target groups. Müller et al. (2013, 2017) evaluated the American recreation fitness trends. They found that leisure service providers - who mostly offer life time type circulation booster recreational sports -including cycling, to the elderly target groups as a way of improving the overall fitness have an interest in exploiting the exponentially expanding market.

Bicycle-ergometer test was used during a research carried out among the elderly (Juhász et al., 2015) to examine the

cardiorespiratory system of physically active and inactive elderly people. Results showed that the physically active group performed better regarding the aerobic capacity during the ergometric examination, which was later confirmed by the results of another examination (a 6-minute walk) as well. Regular recreational sports activity among the elderly also proved to be beneficial on the cardiorespiratory endurance. The results therefore highlight the importance of recreational training among the elderly. Research also shows that swimming and cycling were the most popular leisure activity in the active group among the highly educated and elderly individuals (Balatoni et al. 2016).

Boda et al. (2016) carried out research among pre-school children and found that swimming and cycling ranks high in popularity among the regular sports activities of children between the age of 3 and 7 as they learn the technical basis of these sports at this age.

The research on camping habits of elementary and high school students (Nagy and Müller, 2008), included questions on preferences regarding the choices they would make about the leisure activities during camp. High school students chose cycling after horse riding, while elementary school students

preferred cycling after hiking, which means that cycling ranks high in the preference system of both elementary and high school students.

The survey which involved students majoring in sports (Müller 2009), included questions regarding the most typical activities and physical exercises during trips and the researchers found that bathing and swimming were chosen by 66.7% of the students. The second most common physical activity was hiking (62.8%) the third most popular activity was skiing (49%). Surprisingly, cycling was less popular (13.9%), which is probably due to the lack of infrastructural background in bicycle tourism. Research among students of Economics provided opposite results, since these students chose cycling first during their trips (Mosonyi et al., 2013).

It is not surprising therefore, that integrating walking and cycling into the daily activities of young people became a decisive element of a number of strategies and several authors have dealt with the usefulness of walking or cycling to school (Brug et al., 2012; Faulkner et al., 2009; Ghekiere et al., 2014). At the same time it is important to point out that not only the psychophysical, i.e. the "am I in the mood to cycle" aspects of using bicycles but also aspects determined by the built environment are significant (Goodman, 2013; Fraser and Lock, 2011; Mertens et al., 2016).

Because of its positive impact on health and physical endurance, cycling – either as a form of transportation or leisure activity – should be promoted by all means. It is both a fundamental European Union and a Hungarian objective that bicycles should become one of the most popular forms of transportation as well as tourism and sports equipment as a result of developments between 2014 and 2020. Hungary has favorable conditions for developing bicycle tourism and the ratio of road cycling is already significant thanks to the settlements in the Great Hungarian Plains. (The majority of the population already uses bicycles as a form of transportation in the villages).

Establishing an everyday urban cycling culture for a transportation purpose could provide the solid foundation for bicycle tourism. The greatest challenge in promoting environmentally friendly transportation is persuading motorists to stop looking at their cars as an essential part of transportation. Establishing the conditions of leisure cycling and developing standard of local services are fundamental for improving cycling links between cities and settlements. Developments therefore must originate from local needs as the objective is to make cycling an everyday part of life for an increasing number of people. Tourism can be based on this basic need and infrastructure.

Bicycle-friendly route means the construction of properly developed networks (with road signs, attractions and bicycle-friendly services) of accessible and safe bike paths. Its elements can be bike paths and lanes separated from vehicle traffic, low-traffic public roads, agricultural and forest paths, flood barriers etc.

Therefore the development of cycling could be beneficial for

- improving the overall health of the population and promoting a healthy lifestyle,
- reducing both CO₂ emission and promoting environmental protection,
- creating jobs through the development of bicycle tourism and generating government (tax) revenues,
- increasing bicycle sales, which also develops small- and medium-size enterprises and results economic development,
- possibly reducing fatal road accidents as bicycle culture would develop (National Bicycle Concept/Nemzeti Kerékpáros Koncepció, 2013).

The city of Debrecen is dedicated to developing transportation in this area. This is supported by the fact that cycle paths have been constructed and renovated in recent years, as well as the introduction of UniBike, a bike rental system – unique in the region – at the University of Debrecen, which was justified by the needs and requirements of the students (<http://www.unibike.hu>). For these reasons, our research was aimed at finding out the degree to which cycling is present in the transportation of Debrecen and the reason why the population of the city chooses cycling.

MATERIALS AND METHOD

On the one hand, our research was based on available data. We analyzed studies (An interim assessment of cycling development in the 2007-13 period/ A kerékpáros közlekedésfejlesztés időközi értékelése a 2007-13-as időszakban, Kukely, 2014, National Strategic Report based on 1083/2006 EK/Nemzeti Stratégiai Jelentés, Bojcssev et al., 2014, National Transport Infrastructure Development Strategy/ Nemzeti Közlekedési Infrastruktúra-Fejlesztési Stratégia 2014.; TeKer, 2011) planned studies (Berencsi, 2016; EcoConsult, 2009) and strategic documents for the Northern Great Plains region (Könyves et al., 2006), and Debrecen (Sustainable urban mobility plan of Debrecen/ Debrecen fenntartható városi mobilitási terve 2016; Badalay et al. 2017).

Data collection was based on questionnaires, which involved interviewing adults on their cycling habits. Subjects were visited by interviewers asking them to complete the questionnaire. Subjects were selected based on a randomized probe to ensure a proper representation of the students and staff of the University of Debrecen. Questionnaires were self-made and a test measurement was conducted to ensure that the questions are clear and understandable, the possible answers are appropriate, and to assess the time necessary to complete the survey. Based on the experience gained from the test measurement the questionnaire was updated and the updated version was used in the final survey. The data of the test measurement are not included into the results presented here. The research lasted from January to May in 2017 in Debrecen at the University, and the surveys were on a voluntarily basis. Respondents were visited at their workplace or at the site of their education during the day.

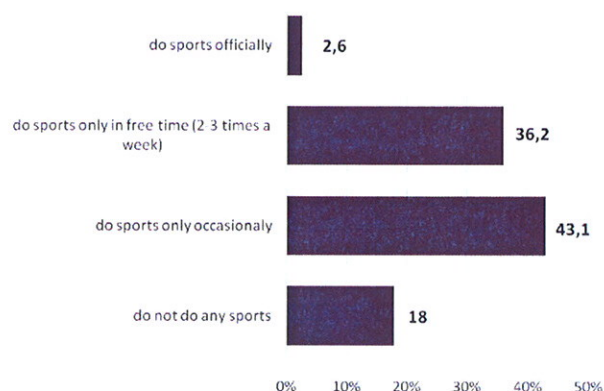
We assessed a total of 851 questionnaires and analyzed them with EvaSys application software (<http://www.vsl.hu>).

RESULTS AND DISCUSSION

The tourism development strategy of the Northern Great Plains region has defined the promoting of cycling area among its development directions years ago. The city of Debrecen and its region is dedicated to constructing new and renovating old bike paths. Until the end of 2011 with the help of different funds 862 km of bike paths had been built in Hungary. In the North Plain Region due to funds totaling 777 million HUF 15.7 km long bike paths had been constructed until 2015. The development of tourism in this direction is promoted by the web-pages and brochures offering bicycle-tours around Debrecen (Tóthné et al., 2015; Bocsi, 2013).

Of the 851 surveyed subjects 69.1 % were women, 30.6% men, while 51.7% were university students between the ages of 18 and 24, the remaining half of the surveyed subjects are employed and between the ages of 25 and 65. The average age was 30.0 ± 11.4 years (mean \pm SD), the age distribution is presented in Table 1. Of the respondents 83.3% have their own bicycles.

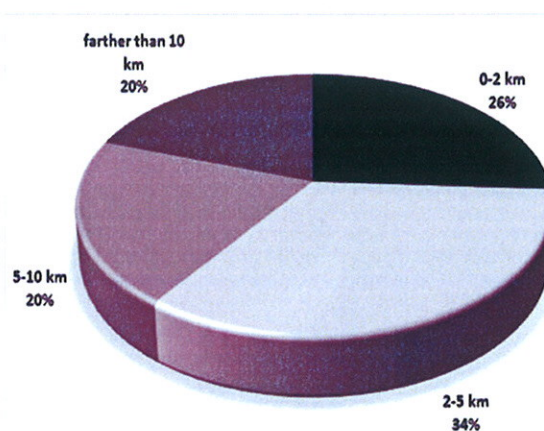
Figure 1 - Frequency of sports activities among respondents



Source: Own compilation based on our questionnaires.

We asked respondents whether they were actively involved in sports activities. 18% do not do sports at all, 43.1% occasionally do sports, and 36.2% do sports in their free time 2-3 times weekly. 2.6% of the respondents officially compete in some kind of sports (Figure 1).

Figure 2 - Distance between residence and workplace/university



Source: Own compilation based on our questionnaires.

26% live less than 2 km from their workplace/university and 33.9% within 5 km. 19.7% said that they lived farther than 10 km (Figure 2).

Table 1. - Frequency of bicycle use

Age group in years (number of persons)	18-24 (441)	25-35 (150)	36-50 (201)	51-65 (59)
use bike daily regardless of the weather	5*	20.7	14.9	13.2
use bike daily depending on the weather	9.9	26.9	17	30.2
use bike weekly	10.9	7.6	8.5	1.9
use bike monthly	3.1	4.1	1.6	1.9
use bike occasionally	41.4	22.8	36.7	34
do not use bike	29.8	17.9	21.3	18.9

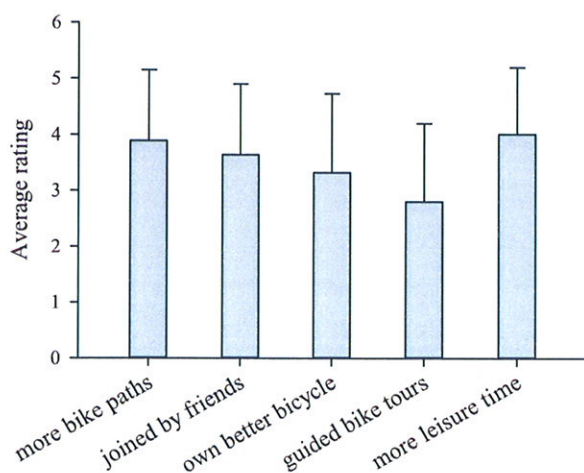
*Data are presented as percentile values giving 100% for each age group.

Note that 10.6% of all respondents said that they use a bicycle daily regardless of the weather and an additional 15.8% also use it daily depending on the weather. 25% does not use a bicycle at all (Table 1). 47.4 % of all those respondents who cycle primarily use the bicycle in their free time for leisure and excursions. 19.2% plus 10.8% goes to work and school by bicycle, an additional 15% use it for shopping and also when taking care of administrative duties (Table 2).

Table 2 - The aim of bicycle use

Age group in years	18-24	25-35	36-50	51-65
(number of persons)	(441)	(150)	(201)	(59)
going to work	0.9*	45.9	37.1	37.5
going to school	19.3	1.4	0	0
free time for leisure and excursions	53.8	32.4	43.8	45.8
shopping, administrative duties	15.6	14.9	15.7	12.5
sport	7.1	4.1	1.1	4.2
other	3.3	1.4	2.2	0

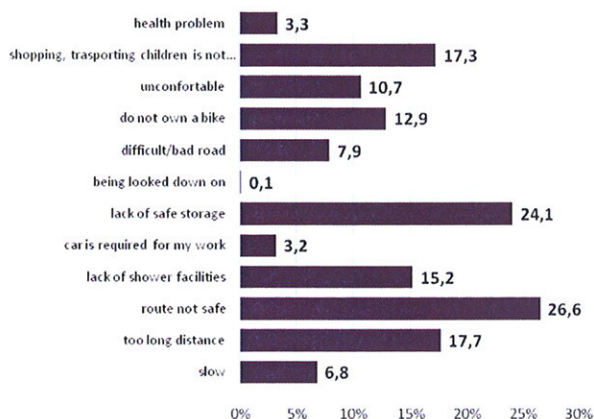
*Data are presented as percentile values giving 100% for each age group.

Figure 3 - Motivation for more cycling. Data are presented as mean \pm SD

Source: Own compilation based on our questionnaires.

We were interested in finding out what would motivate respondents to do more cycling. They were asked to rate on a scale of one to five the different possibilities. Although results were examined according to both genders and age groups, no significant differences were found in these respects. Respondents would primarily be motivated by more bike paths and more leisure time for doing more cycling. Further motivation would be if friends and family members could also join in (Figure 3). The least motivating would be if there were more guided bike tours (although 54.7% of the respondents have never been on a guided bike tour).

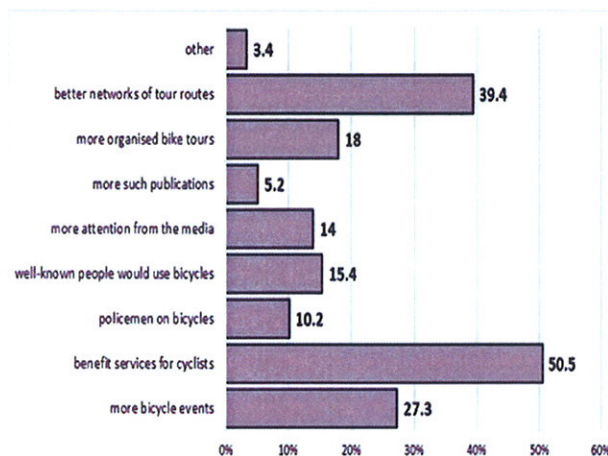
Figure 4 - Obstacles of cycling (multiple choices were possible)



Source: Own compilation based on our questionnaires.

When exploring the obstacles of cycling 26.6% of the respondents answered that "I do not know a safe route to get to where I want to go". Other frequent responses included "long distance", "lack of safe storage", and "cannot solve issues related to administration, shopping, child transportation if I am with a bike" (Figure 4).

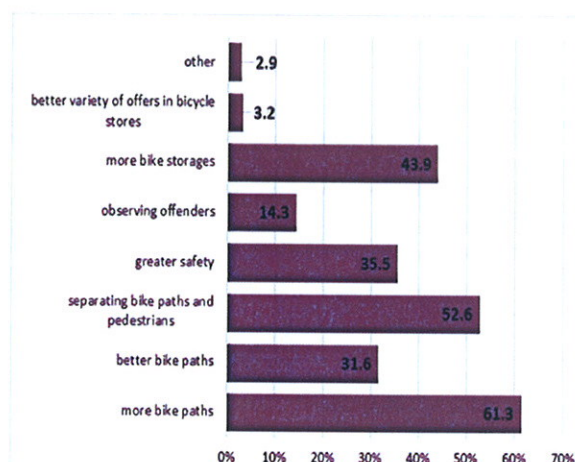
Figure 5 - Possibilities of promoting cycling (multiple choices were possible)



Source: Own compilation based on our questionnaires.

50.5% of the respondents answered that providing benefit services for cyclists and 39.4% suggested better tour routes for cycling as a way to promote cycling in Debrecen (Figure 5).

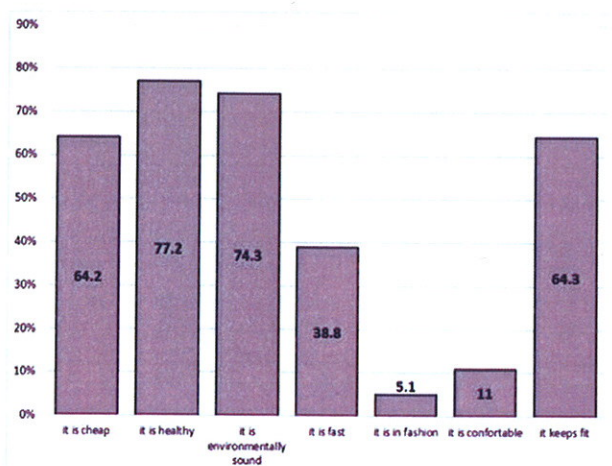
Figure 6 - Possibilities of improving cycling in Debrecen (multiple choices were possible)



Source: Own compilation based on our questionnaires.

We asked respondents what they felt is needed to be improved to promote cycling in Debrecen. The respondents suggested more, better (in surface quality), and safer bike paths complemented with increasing the number of safe bike storage facilities (Figure 6).

Figure 7 - Advantages of cycling (multiple choices were possible)



Source: Own compilation based on our questionnaires.

The surveys clearly reflected that respondents are fully aware of the positive impacts of cycling on health and environment (Figure 7).

CONCLUSIONS

Our research involved 851 employees and students at the University of Debrecen on surveying their cycling habits. 83.3% of the respondents have their own bicycles, 59.9% live within 5 km of their workplace but only 26.4% said that they use their bicycles daily and only 47.4 % of the respondents cycle in their free time.

Suggestions for development primarily included safety (both regarding route and storage), and better development of bike path networks. Beyond the aforementioned motivation factors, more free time and being joined by family members and friends are worth mentioning. These observations are in line with those international studies, which thoroughly examined the role that cycling plays in urban transport beyond maintaining health and found that the built environment and within this especially bike paths that can be safely used and facilities suitable for storing bicycles as well as bike paths in proximity to home and workplace play a decisive role in improving the cycling habits of the population (Oja et al., 2011; Rojas-Roeda et al., 2011; Vuori, 2011).

Furthermore, it is important to mention that a number of examinations have also pointed out the economic benefits of cycling beyond its role in maintaining health. According to findings, over half of the journeys taken by car were less than 8 kilometers in distance in the United States and the social costs including damage to property and lost working time, air pollution and costs of illnesses caused by air pollution, as well as costs related to physical inactivity and the consequent obesity are close to 400 billion USD (Manson et al., 2015). Naturally, it cannot be expected that all of these journeys, which can be taken by bicycles in fifteen minutes, will actually be taken by bicycles but even a small change could result in significant savings considering the consequent expenditures.

The clear objective is, therefore to develop bike paths in Europe, including Hungary which provide the possibility of safe cycling. In parallel, the advantages of cycling, such as positive physiological effects, cost-efficiency and environmental awareness must be promoted in order to increase the number of those in the population which prefers this alternative.

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