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REMOTE STUDY AND DECONSUMPTION – SUSTAINABLE MOBILITY VERSUS (UN)NECESSARY UNIVERSITY COMMUTING

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ABSTRACT: Remote study was one of the many restrictions implemented during the COVID-19 pandemic. It resulted in a deconsumption of university commuting which, together with telecommuting, could be considered as a means to implement a sustainable mobility policy. Within this context, this paper investigates student's perceptions of the advantages and disadvantages of daily travel before the online learning started with focus on the resultant satisfaction from the use of given means of transport. In this context, we examined the potential for developing more sustainable mobility and possibilities for further deconsumption of transport processes. This was based on the results of a preliminary survey the author conducted online among students of two public universities in Poland. The results obtained, revealed that the respondents associated commuting to university with more advantages than disadvantages. However, these perceptions differed dependent on the most frequently used transport mode. Car users hardly benefited from commuting compared to other transport users and were the group least likely to resign from individual motorisation. Pedestrians and cyclists perceived most benefits and were most satisfied. In general, students expected to continue commuting using the transport modes they used prior to the pandemic. Nevertheless, when students were asked about their "dream transport mode" which enabled the possibility for deconsumption of commuting by way of a cheap and commonly available teleportation, private car turned out to be a better option than teleportation among students commuting either by car or by urban public transport. In such a hypothetical situation, only car users and active commuters were not prepared to change their transport behaviour.

KEYWORDS: remote learning, deconsumption, sustainable mobility, commuting to university, COVID-19 pandemic

Introduction

A new variant of coronavirus that emerged in China in 2019 quickly spread all over the world causing the coronavirus (COVID-19) outbreak. At the beginning of March 2020, WHO announced a global COVID-19 pandemic (WHO, 2020) which irreversibly changed most lives. One of the first effects of the pandemic in Poland was a government decision to move from traditional to remote study (Regulation of the Minister of National Education..., 2020). Although this change in the form of learning was expected to be temporary, the lockdown has lasted, with some breaks (eg. in October 2020) and exceptions, more than one academic year.

Multiple studies have been conducted so far to investigate distinct challenges related to remote learning in higher education during the pandemic (e.g. Souza et al., 2020; Zawadka et al., 2021; Ho et al., 2021; Razami and Ibrahim, 2021; Camilleri, 2021). This study however, provides new insights on distance learning, as it prescinds from analysing different aspects of the study process and focuses strictly on another issue resulting from lockdown, namely on obligatory deconsumption of university commuting. On the one hand, reduction of commuting can be considered a shift towards more sustainable urban mobility and a gradual reduction of negative transport externalities (e.g. Mokhtarian and Salomon, 1995, 1997; Lier et al., 2012; Nilles, 1976; Hopkins and McKay, 2019; Ahvenniemi et al., 2017). On the other hand, the question arises, whether daily travels to university were rather a necessary but stressful and irksome nuisance (e.g. Maguire and Morris, 2018; Chappell et al., 2020). It can be also the case that students could have enjoyed some benefits in commuting (e.g. Mokhtarian et al., 2001; Páez and Whalen, 2010; Shaw et al., 2019). Understanding these behavioural patterns plays an important role in sustainable mobility policy in terms of advantages and disadvantages of commuting to university perceived by students using different means of transport. Firstly, the satisfaction derived from the balance of advantages and disadvantages can affect present and future transport choices. Secondly, it could be an alternative measure of the attractiveness of transport modes for students in addition to the so-called transport demands (Marszałek, 2001), regarded as required qualitative attributes of different means of transport (e.g. Paradowska, 2020; Cattaneo et al., 2018, Romanowska et al., 2019).

Having said this, the goal of the paper is to investigate students' perceptions on the advantages and disadvantages of day-to-day commuting before the start of online learning with a focus on the resultant satisfaction from the use of different means of transport. In this context, we examined the propensity for a more sustainable mobility and the potential, theoretical further

deconsumption of transport processes. We based our research on empirical results from an online survey conducted among students of two public universities in Poland covering five research questions:

- To what extent students associated daily commuting to university in pre-pandemic times with advantages and disadvantages related to travelling?
- Were there any differences in advantages and disadvantages perceived by commuters using particular transport modes?
- To what extent diverse groups of commuters were likely to give up their private cars in order to take care of the local community and the environment?
- What are the most likely and the “dream modes” of commuting among disparate groups of transport users after the pandemic?
- If there was such a possibility, would students demonstrate a deconsuming attitude and use a teleport to reach the university or maybe they would prefer to commute by a particular mean of transport?

Literature review

Urban areas worldwide are facing growing problems resulting from non-sustainable mobility based predominantly on motor vehicles. These have an social, economic, and environmental impact through negative transport externalities (e.g. UN-Habitat, 2013; WHO Regional Office for Europe, 2017; European Commission, 2019, Ricardo-AEA, 2014, Paradowska, 2011). For this reason, for decades there has been a strong focus on the development of effective sustainable urban mobility tools aiming at a shift in transport behaviour towards more sustainable modes and a reduction in their negative externalities (e.g. European Union, 2017; UNECE, 2020; UN-Habitat, 2013; European Union, 2020; OECD, 2002; Werland, 2020; OECD, 1996; European Platform on Sustainable Urban Mobility Plans, 2019a, 2019b). Simultaneously, extensive research has been conducted on the efficiency of sustainable modes of urban mobility (e.g. Dedele and Miskinyte, 2021; Fonseca et al., 2021; Cornagoi, 2019; Enochsson et al., 2021; Morfoulaki and Papatheanasiou; 2021; Paradowska, 2019a, Mayes, 1996; Meijer, 2017; Achearpong et al., 2021; Meng et al., 2017; Trela, 2017) in line with studies on multiple factors influencing more sustainable transport choices (e.g. Grison et al., 2016; Ramezani et al., 2018; Paradowska, 2014; Schwanen and Lucas, 2011; Schneider, 2011; Litman, 2008; Chee and Fernandez, 2013; Scheepers et al., 2016; Ye and Titheridge, 2017; Christiansen et al., 2016, De Jong and Van de Riet, 2008; De Vos et al., 2016; Setiawan et al., 2015; Kuppam et al., 1999;

Popuri et al., 2011). These issues have gained traction, as car users are hardly likely to resign from cars, and people in general are more prone to switch from public transport to a car than the other way round (e.g. Platje et al., 2018; Paradowska, 2019b, Setiawan et al., 2015; Beirão and Sarsfield Cabral, 2007).

Phenomena related to a shift towards sustainable urban mobility and more sustainable transport choices can be investigated through the theoretical lens of deconsumption, which, in turn, is considered a form of sustainable consumption (e.g. Cherrier et al., 2010; Lee et al., 2009; Łuczka and Smoluk-Sikorska, 2017; Bylok, 2017; Burgiel and Zrałek, 2015). Some authors define deconsumption (aka: anti-consumption, non-consumption) as the opposite of consumerism being characterised by a more conscious consumption (Leonard and Conrad, 2011; Bywalec and Rudnicki, 2002) or by rational, conscious, responsible and ethical consumption (Szul, 2012), or simply by numerous ways of consumption reduction, including sharing products, etc. (Patrzalek, 2019). One of the clearest and most distinct forms of deconsumption of transport processes is telecommuting, as it involves no regular, frequent, and obligatory physical transport caused by needs to reach workplaces, universities or schools. In the pre-pandemic era, telecommuting could be understood as “intentional non-consumption” or “incidental non-consumption” (Cherrier et al., 2011), as people consciously and voluntarily would give up working in an office and/or chose e-learning (e.g. Ismail et al., 2016; Hartman et al., 1991; Yen et al., 1994). This changed during the COVID-19 pandemic. In most countries, telework and remote learning replaced traditional ways of working and studying, fitting more to “ineligible non-consumption”.

Many studies conducted before and during the COVID-19 pandemic underline social and environmental benefits resulting from telecommuting in terms of a reduction of negative transport externalities (e.g. Hopkins and McKay, 2019; Mokhtarian and Salomon, 1995, 1997; Lier et al., 2012; Ahvenniemi, 2017, Bieser et al., 2021; Bojovic et al., 2020, Irwin, 2004; Belzungeni-Eraso and Erro-Garcés, 2020) with not much attention paid to various personal advantages and disadvantages resulting from daily commuting (e.g. Mokhtarian and Salomon, 1995, 1997, 2001; Mokhtarian et al., 2015; Páez and Scott, 2007; Páez and Whalen, 2010; Harvey and Taylor, 2000; Shaw et al., 2019) or to the impact of telecommuting on future transport choices (e.g. Moslem et al., 2020; Conway et al., 2020). Though multiple studies have been conducted to investigate different aspects of remote learning in higher education, including teaching quality, factors influencing effectiveness of remote studying, students' satisfaction or barriers faced by students and teachers (e.g. Rahiem, 2020; Kisanga and Ireson, 2015; Azzahra, 2020; Souza et al.,

2020; Zawadka et al., 2021; Ho et al., 2021; Razami and Ibrahim, 2021; Ferri et al., 2020), little research has been devoted to the role of commuting. This study attempts to narrow this research gap not only by examining the importance of daily commuting for students before the COVID-19 pandemic in terms of perceived advantages and disadvantages. Another open area refers to the willingness of commuting in the future, especially considering expected deconsumption, likely resignation from car use and more sustainable transport choices. To the author's best knowledge, no empirical study to date has dealt with the differences between perceptions on advantages and disadvantages of commuting to the university before the COVID-19 pandemic and willingness to deconsume commuting in the future depending on the most frequently used transport mode. The new insights provided in this paper focus not only on the links between perceived satisfaction from commuting by given transport mode resulting from benefits and drawbacks of the transport process but also on future transport choices. An important exploratory aspect of this study is related to the attitude-behaviour gap revealing low propensity to deconsume commuting and resign from a car in a hypothetical situation. These issues fit in with discussions around developing effective instruments supporting sustainable transport attitudes and behaviours (e.g. European Union, 2017; UNECE, 2020; European Union, 2020; European Platform on Sustainable Urban Mobility Plans, 2019a, 2019b), including sustainable transport choices made by students (dell'Olio et al., 2019; Rotaris and Danielis 2014, 2015; Setiawan et al., 2015; Cattaneo et al., 2018; Romanowska et al., 2019; Paradowska, 2019b), the problem of knowledge-attitude-behaviour gaps in developing sustainable consumption (e.g. Burgiel, 2020; Terlau and Hirsch, 2015; Bernardes et al., 2018; Luchs et al., 2015), as well as the low demand elasticity of travelling by car (e.g. Berri, 2009; McCarthy, 1996; EIA, 2014; Dong et al., 2012).

There are, however, some limitations. First, we conducted the survey one year after remote studying had been introduced, which could have resulted in respondents' opinions on the perceived meaning of commuting much more declarative. Second, the survey questions did not include all factors influencing transport choices, as the questionnaire was subordinated to the research problem which focussed on the advantages and disadvantages of commuting as well as on future ways of reaching the university in the context of sustainable mobility. Third, this is a case study of two public universities in Poland. Because of the size and characteristics of the sample, findings cannot be extended to the total population, and future research is necessary to investigate students' transport behaviour after the pandemic ends.

Research methods

The primary tool for collecting data was an online survey designed and completed in April 2021 among students of the Institute of International Studies (IIS UWr) at the Faculty of Social Sciences (University of Wrocław, Poland) and among students of the Faculty of Economics at the University of Opole (FE UO, Poland). The questionnaire comprised five key parts aimed at discovering respondents' preferences in following areas:

- the most frequently used means of transport while commuting to the university before the pandemic,
- advantages and disadvantages of commuting¹,
- propensity to resign from commuting by car for environmental and social (local community) reasons,
- the most likely and “dream modes” of future commuting,
- propensity to replace physical commuting to the university by teleportation.

Quota, convenience, and purposive sampling as techniques of non-probability sampling (Ackoff, 1953; Davis, 2005; Taherdoost, 2016) were used in the study. Selecting respondents, the author set the following criteria: accessibility and readiness to take part in the research, expected distribution of characteristics related to commuting (e.g.: means of transport, distance to the university, availability of a car, driving licence) in subpopulations of students from both selected universities, expected reliability and honesty answering survey questions. Due to the size of Wrocław and Opole, location of IIS UWr and FE UO, availability, organisation of public transport and the level of congestion², we expected distinct survey results from students' subpopulations in terms of their commuting patterns. This, in turn, should provide valuable insights into the variety of respondents' perceptions of advan-

¹ There were 19 variables related to advantages and 15 variables related to disadvantages included in the survey questionnaire, based on own experience of the author and studies performed by Mokhtarian and Salomon (1995, 1997, 2001); Mokhtarian et al. (2015), Páez and Scott (2007), Harvey and Taylor (2000), Shaw et al. (2019), Maguire and Morris (2018), and Chappell et al. (2020).

² Wrocław is the fourth largest city in Poland in terms of the population and fifth in terms of the area. It is the capital of the Lower Silesia Voivodship and of the developing Wrocław Agglomeration (Encyklopedia PWN). In the ranking prepared by Globalization and World Cities Research Network (2020) Wrocław was classified in the IX category Gamma which was the second best ranking position (after Warsaw) among Polish cities. It is one of the Polish cities with the largest economic and social potential, developed public transportation and cycling infrastructure, but at the same time facing traffic congestion. Opole is the twenty-seventh largest city in Poland in terms of the population and fifteenth in terms of the area. It is the capital of the Opole Voivodship, which is the smallest from 16 Polish provinces both in terms of the population and the area (Encyklopedia PWN).

tages and disadvantages of commuting by different transport modes, as well as into their future behavioural transformation. However, as mentioned above, this is only a preliminary research, hence the sample can only be treated as an experimental group. The analysis of empirical results was carried out in SPSS software mainly by applying Pearson chi-squared tests and comparison of relative shares in answers.

Research results

Among 404 respondents, there were 39.9% (161) students from IIS UWr and 60.1% (243) from FE UO. Respondent age range varied from 17 to 35 with those aged 19 (44, 10.9%), 20 (110, 27.4%), 21 (98, 24.4%) and 22 (59, 14.7%) prevailing. Females (275, 68.1%) outnumbered males (127, 31.4%) in the total sample. What is also important, is that there were statistically significant differences³ between respondents representing IIS UWr and FE UO both in terms of basic attributes (such as gender and age), as well as in characteristics related to commuting. On average, FE UO students were slightly older with a significant predominance of females (176, 72.4% from all respondents representing FE UO) over males (65 and 26.7%), whereas in the case of IIS UWr, there were 38.5% (62) of males and 61.5% (99) of females. Another characteristic feature was that the IIS UWr students commuted up to 10 km (less than 3 km – 32, 19.9%, 4-5 km – 37, 23%, 5-10 km – 45, 28%), whereas at the FE UO, short- and long-distance commutes predominated (less than 3 km – 86, 35.4%, over 30 km – 74, 30.5%). Commuting time for the largest group of IIS UWr respondents was between 10 and 60 minutes (11 to 30 – 64, 39.8%, 31 to 60 minutes - 60, 37.2%) with only 11.8% (19) spending 10 minutes or less on their commute. FE-UO student commutes also took mostly between 11 and 60 minutes (11 to 30 – 77, 31.7%, 31 to 60 – 66, 27.1%). However, comparing commuting times between the two universities, larger groups for FE UO took either 10 minutes or less (57, 23.5%) or over one hour (43, 17.7%). In the total sample, the largest groups commuted from a rented room/apartment (156, 38.6%) or family home in another city/countryside (145, 35.9%). Most IIS UWr students (101, 62.7% of IIS UWr respondents) commuted to the university from a rented room/apartment, 18% (29) from a family home in another city/countryside with 12.4% (20) from a family home in the city where the university is located. The proportions among respondents from FE UO were: rented room/apartment – 22.6% (55), family home in another city/countryside – 47.7% (116),

³ The chi square test showed statistically significant differences between the variables at the significance level $p < 0.05$.

family home in the city where the university is located – 12.3% (30). 83.2% of all respondents (336) had a driving licence, while 13.6% (55) declared they would get one in the foreseeable future. A visibly higher share of students at FE UO (213, 87.7% of respondents from FE UO) had a driving licence than at IIS UW (123, 76.4% of respondents from IIS UW). 39.6% (160) of all respondents had their own car with the same number driving someone else's car, while 13.9% (56) planned to buy one in the future. We also observed greater car availability among respondents studying at FE UO (204, 84% of FE UO students surveyed) than at IIS UW (116, 72.1% respectively). As mentioned above, these differences, resulting from distinctive characteristics of both cities and universities, were expected to give better insights into diversified respondent perceptions on advantages and disadvantages of commuting to the university by a particular means of transport.

High car availability with the majority having a driving license did not translate into a modal split of the university commuters. As presented in table 1, the most frequently used means were urban public transport (118, 29.2% of all respondents), active transport modes (84, 20.8%), car (70, 17.3%), and regional public transport (68, 16.8%). 15.1% of students surveyed (61) used multimodal options. Only 3 respondents (0.7%) commuted by other means of transport, thus their answers were not included in the further analysis. Respondents travelling to the university by urban public transport covered mostly an average distance of 4-10 km with travel time varying from 11-20 to 41-50 minutes. Students who preferred walking to the campuses were short-distance commuters who rather indicated shorter travel times. Students commuting from a rented room/apartment prevailed in both groups of respondents. As far as car users are concerned, there were two dominant groups: students who commuted on average 5-15 km and those living over 30 km from the university. Regional public transport was the mode relatively often preferred by respondents commuting from family homes in another city or in the countryside located over 21 km from the university. Among respondents using multiple modes, long-distance commutes and those of 4-10 km prevailed.

There were 19 variables selected in the study to investigate respondents' perceptions on the advantages of commuting to the university before the COVID-19 pandemic (table 2). Chi-squared tests showed statistically significant differences between respondents commuting by distinct transport modes for 15 variables (significance level $p < 0.05$). Planning time after classes and possibility of getting different things done on the way were considered the most important benefits among all groups of commuters. However, for car users it was rather an opportunity to ensure a psychological distance between home and university. Respondents commuting by urban

Table 1. Characteristics of respondents commuting by a particular mean of transport

Variable	% of respondents commuting by a particular mean of transport:				
	car ^a	urban public transport	regional public transport	on foot/ bicycle ^b	multiple modes ^c
Percentage of all respondents	17.3	29.2	16.8	20.8	15.1
University*					
- IIS UW	11.8	50.9	4.3	11.8	21.1
- FE UO	21.0	14.8	25.1	26.7	11.1
Distance to university*					
- less than 1 km	2.9	3.4	5.9	59.5	3.3
- 1-3 km	8.6	9.3	8.8	38.1	1.6
- 4-5 km	8.6	31.4	4.4	2.4	14.8
- 5-10 km	15.7	33.1	2.9	0.0	14.8
- 11-15 km	14.3	9.3	1.5	0.0	1.6
- 16-20 km	2.9	4.2	8.8	0.0	6.6
- 21-30 km	11.4	3.4	25.0	0.0	6.6
- more than 30 km	35.7	5.9	42.6	0.0	50.8
Commuting time*					
- less than 5 min.	4.3	2.5	1.5	14.3	1.6
- 6-10 min.	7.1	2.5	4.4	52.4	1.6
- 11-20 min.	18.6	22.0	13.2	31.0	1.6
- 21-30 min.	21.4	32.2	7.4	1.2	9.8
- 31-40 min.	14.3	15.3	16.2	0.0	9.8
- 41-50 min.	8.6	18.6	5.9	0.0	16.4
- 51-60 min.	5.7	2.5	27.9	0.0	19.7
- more than 1 hour	20.0	4.2	23.5	1.2	39.3
Place of residence*					
- family home in city where university is located	22.9	16.9	1.5	10.7	4.9
- family home in another city/country-side	55.7	11.0	83.8	0.0	57.4
- dormitory	2.9	5.9	5.9	27.4	4.9
- rented room/apartment	17.1	62.7	4.4	59.5	27.9
- others	1.4	3.4	4.4	2.4	4.9

Driving licence*					
- yes	98.6	78.8	83.8	82.1	75.4
- no, but plans to get a driving licence in the future	1.4	16.9	13.2	15.5	18.0
- no, no plans to get a driving licence	0.0	4.2	2.9	2.4	6.6
Availability of a car					
- driving own car	78.6	29.7	26.5	32.1	36.1
- driving someone else's car	20.0	42.4	48.5	47.6	37.7
- no car available, plans to buy one	1.4	16.9	17.6	15.5	16.4
- no car available, no plans to buy any in the future	0.0	11.0	7.4	4.8	9.8

a – both car drivers (62, 15.3% of all respondents) and car passengers (7, 1.7% of all respondents), b – pedestrians accounted for 20% (81) while cyclists only for 0.7% (3) of all respondents, c – different means of transport during one travel to/from the university.

* - there were statistically significant differences between this characteristic of respondents commuting by a particular mean of transport at the significance level $p < 0.05$.

Source: author's work based on the survey research.

and regional public transport appreciated the fact that they had time for relaxation, while both urban public transport users and those walking or cycling benefited from contacts with fellow students or with other people. Physical activity was one of the most important advantages for active travelers, whereas long distance or multimodal commuters used their commuting time to study before classes. The most striking feature is that car drivers and passengers perceived the lowest levels of advantages compared to the other transport users. The most satisfied group were active commuters who recognised numerous personal benefits.

Table 2. Opinions on advantages of commuting depending on the most frequently used transport mode

Advantages	Opinions of respondents commuting by a particular means of transport (%):																							
	Total opinions						car			urban public transport			regional public transport			on foot/bicycle			multiple modes					
	Rank	Negation	Neutral	Confirmation	Rank	Negation	Neutral	Confirmation	Rank	Negation	Neutral	Confirmation	Rank	Negation	Neutral	Confirmation	Rank	Negation	Neutral	Confirmation				
Planning time after classes*	1	14.7	12.0	73.3	2	17.1	14.3	68.6	1	11.0	5.1	83.9	1	17.6	7.4	75.0	2	9.5	9.5	81.0	1	19.7	4.9	75.4
Getting different things done on the way*	2	14.2	13.2	72.6	1	7.1	7.1	85.7	2	16.1	7.6	76.3	2	16.2	16.2	67.6	1	4.8	10.7	84.5	2	19.7	6.6	73.8
Planning the day at the university	3	20.0	19.7	60.3	3	22.9	12.9	64.3	6	26.3	16.9	56.8	4	17.6	19.1	63.2	7	20.2	14.3	65.5	4	18.0	21.3	60.7
Time for relax*	4	27.2	15.0	57.9	9	50.0	12.9	37.1	3	24.6	8.5	66.9	3	19.1	16.2	64.7	14	21.4	21.4	57.1	6	36.1	9.8	54.1
Distancing from home matters and focusing on studies	5	26.7	18.5	54.9	4	25.7	17.1	57.1	7	31.4	11.9	56.8	12	27.9	20.6	51.5	6	14.3	19.0	66.7	9	37.7	16.4	45.9
Benefitting from contacts with other people*	6	25.4	20.0	54.6	11	42.9	24.3	32.9	5	23.7	15.3	61.0	6	26.5	14.7	58.8	5	17.9	14.3	67.9	5	26.2	18.0	55.7
Benefitting from contacts with fellow students*	7	25.4	20.4	54.1	10	50.0	14.3	35.7	4	22.9	16.1	61.0	7	22.1	22.1	55.9	4	15.5	11.9	72.6	7	24.6	23.0	52.5
Learning before classes*	8	32.2	15.2	52.6	15	70.0	10.0	20.0	8	38.1	10.2	51.7	5	20.6	17.6	61.8	19	64.3	21.4	14.3	3	18.0	9.8	72.1

Distancing from studying and focusing on home matters*	9	28.9	20.7	50.4	5	30.0	21.4	48.6	10	34.7	16.1	49.2	8	22.1	23.5	54.4	12	19.0	22.6	58.3	14	47.5	14.8	37.7
An important and useful home-university boundary	10	28.4	23.7	47.9	6	34.3	18.6	47.1	9	29.7	20.3	50.0	14	35.3	26.5	38.2	10	11.9	28.6	59.5	11	34.4	26.2	39.3
An excellent opportunity for physical activity*	11	29.4	24.7	45.9	14	62.9	12.9	24.3	11	28.8	22.9	48.3	10	22.1	26.5	51.5	3	9.5	13.1	77.4	10	24.6	34.4	41.0
Better physical fitness*	12	32.4	23.2	44.4	13	58.6	15.7	25.7	12	33.1	24.6	42.4	9	27.9	19.1	52.9	11	13.1	27.4	59.5	12	34.4	26.2	39.3
Benefiting from contact with nature*	13	33.2	24.9	41.9	12	47.1	22.9	30.0	13	35.6	23.7	40.7	13	32.4	26.5	41.2	8	14.3	22.6	63.1	15	42.6	23.0	34.4
Better preparation for classes*	14	35.4	23.2	41.4	17	62.9	18.6	18.6	16	43.2	23.7	33.1	11	25.0	23.5	51.5	17	56.0	26.2	17.9	8	32.8	19.7	47.5
Commuting as a satisfaction in itself*	15	32.9	25.9	41.1	7	35.7	17.1	47.1	14	36.4	25.4	38.1	16	33.8	38.2	27.9	13	14.3	28.6	57.1	16	50.8	19.7	29.5
Stress reduction*	16	37.9	22.9	39.2	8	47.1	14.3	38.6	15	39.8	22.9	37.3	17	44.1	29.4	26.5	9	20.2	19.0	60.7	17	52.5	18.0	29.5
Useful time*	17	39.9	25.4	34.7	16	58.6	22.9	18.6	17	51.7	23.7	24.6	15	35.3	29.4	35.3	15	32.1	27.4	40.5	13	39.3	23.0	37.7
Additional development activities*	18	50.4	20.9	28.7	18	68.6	14.3	17.1	18	61.9	16.1	22.0	18	47.1	30.9	22.1	18	57.1	27.4	15.5	19	63.9	16.4	19.7
Time for activities otherwise not done	19	48.9	23.4	27.7	19	67.1	21.4	11.4	19	55.9	23.7	20.3	19	54.4	23.5	22.1	16	46.4	31.0	22.6	18	59.0	18.0	23.0
Overall perceptions of advantages of commuting*	-	30.7	20.7	48.6	-	45.2	16.5	38.3	-	33.9	17.6	48.4	-	28.8	22.7	48.5	-	24.3	20.9	54.8	-	35.9	18.4	45.7

* statistically significant differences between opinions of respondents commuting by a particular mode of transport with significance level $p < 0.05$.

Source: author's work based on the survey research.

Table 3. Opinions on disadvantages of commuting depending on the most frequently used transport mode

Disadvantages*	Opinions of respondents commuting by a particular means of transport (%):																							
	Total opinions			car			urban public transport			regional public transport			on foot/bicycle			multiple modes								
	Rank	Negation	Confirmation	Rank	Negation	Confirmation	Rank	Negation	Confirmation	Rank	Negation	Confirmation	Rank	Negation	Confirmation	Rank	Negation	Confirmation						
Too long due to traffic jams	1	22.4	20.7	56.9	1	21.4	17.1	61.4	1	28.0	11.0	61.0	7	35.3	25.0	39.7	14	81.0	9.5	9.5	3	13.1	27.9	59.0
Waste of time	2	26.7	17.7	55.6	2	38.6	17.1	44.3	3	39.8	11.0	49.2	1	22.1	19.1	58.8	1	64.3	10.7	25.0	1	13.1	14.8	72.1
Commuting to university was very tiring	3	28.9	20.4	50.6	7	41.4	28.6	30.0	2	34.7	15.3	50.0	4	35.3	14.7	50.0	3	73.8	7.1	19.0	2	19.7	16.4	63.9
Something to "kill time"	4	31.9	20.4	47.6	10	70.0	11.4	18.6	4	30.5	22.0	47.5	2	26.5	16.2	57.4	5	65.5	17.9	16.7	5	24.6	21.3	54.1
Fewer opportunities to rest after classes	5	36.4	18.7	44.9	4	45.7	17.1	37.1	8	55.9	15.3	28.8	3	35.3	13.2	51.5	11	76.2	13.1	10.7	4	23.0	19.7	57.4
Big financial burden	6	36.7	20.7	42.6	3	41.4	15.7	42.9	9	56.8	14.4	28.8	6	33.8	25.0	41.2	13	79.8	9.5	10.7	6	29.5	23.0	47.5
Only useful aspect being to get to university/home	7	38.2	20.7	41.1	6	48.6	18.6	32.9	5	50.0	14.4	35.6	8	44.1	19.1	36.8	4	69.0	13.1	17.9	7	32.8	26.2	41.0
Unnecessary pollution and waste of non-renewable fossil fuels.	8	36.2	24.7	39.2	5	44.3	20.0	35.7	7	49.2	20.3	30.5	9	38.2	27.9	33.8	6	67.9	16.7	15.5	8	32.8	29.5	37.7
Very tiring noise levels	9	42.6	18.5	38.9	11	70.0	12.9	17.1	6	52.5	11.9	35.6	5	38.2	16.2	45.6	2	71.4	9.5	19.0	10	39.3	26.2	34.4

Increased levels of stress	10	43.4	23.7	32.9	9	54.3	24.3	21.4	10	61.0	16.1	22.9	14	47.1	27.9	25.0	10	76.2	11.9	11.9	9	36.1	26.2	37.7
Negative feelings regarding home matters	11	44.6	22.4	32.9	8	54.3	21.4	24.3	11	60.2	20.3	19.5	11	44.1	23.5	32.4	7	67.9	19.0	13.1	11	49.2	18.0	32.8
Negative feelings regarding study matters	12	47.4	21.4	31.2	12	58.6	27.1	14.3	13	64.4	16.9	18.6	10	48.5	17.6	33.8	12	78.6	10.7	10.7	12	49.2	18.0	32.8
"Dying" of boredom	13	48.4	21.9	29.7	13	62.9	22.9	14.3	12	61.9	19.5	18.6	12	52.9	14.7	32.4	15	77.4	15.5	7.1	13	50.8	24.6	24.6
Irritating contact with other people	14	50.9	22.9	26.2	15	74.3	21.4	4.3	14	67.8	15.3	16.9	13	42.6	27.9	29.4	9	76.2	11.9	11.9	14	54.1	26.2	19.7
Fear for own safety	15	55.6	21.2	23.2	14	70.0	20.0	10.0	15	78.0	8.5	13.6	15	61.8	20.6	17.6	8	76.2	10.7	13.1	15	49.2	37.7	13.1
Overall perceptions of disadvantages of commuting	-	39.4	21.1	39.6	-	53.0	19.7	27.2	-	52.7	15.5	31.8	-	40.4	20.6	39.0	-	73.4	12.5	14.1	-	34.4	23.7	41.9

* Statistically significant differences between opinions on disadvantages of commuting by a particular mean of transport at significance level $p < 0.05$.

Source: author's work based on the survey research.

Table 4. Satisfaction with commuting and pro-social and pro-environmental attitudes of respondents depending on the most frequently used transport mode

Statements	Total opinions														Opinions of respondents commuting by a particular means of transport (%):													
	car				urban public transport				regional public transport				on foot/bicycle				multiple modes											
	Negative	Neutral	Positive	Negation	Confirmation	Negation	Confirmation	Negation	Confirmation	Negation	Confirmation	Negation	Confirmation	Negation	Confirmation	Negation	Confirmation											
I am satisfied commuting by the means of transport I use to reach the university	25.2	23.7	51.1	18.6	21.4	60.0	24.6	22.9	52.5	30.9	23.5	45.6	3.6	8.3	88.1	45.9	21.3	32.8										
I would prefer to teleport rather than commute to the university	22.2	20.2	57.6	34.3	15.7	50.0	26.3	11.0	62.7	20.6	27.9	51.5	45.2	23.8	31.0	16.4	23.0	60.7										
I try to take care of the environment while commuting	18.7	38.4	42.9	38.6	44.3	17.1	15.3	33.1	51.7	16.2	45.6	38.2	4.8	26.2	69.0	14.8	47.5	37.7										
I try to take care of the local community while commuting	18.5	42.6	38.9	28.6	45.7	25.7	15.3	42.4	42.4	20.6	54.4	25.0	9.5	39.3	51.2	19.7	45.9	34.4										
I am ready to resign from commuting by car to care for the local community	28.2	26.9	44.9	70.0	15.7	14.3	18.6	22.9	58.5	20.6	39.7	39.7	6.0	23.8	70.2	29.5	31.1	39.3										
I am ready to resign from commuting by car to care for the environment	29.7	28.9	41.4	68.6	17.1	14.3	19.5	27.1	53.4	29.4	36.8	33.8	14.3	23.8	61.9	29.5	37.7	32.8										
I am ready to incur additional costs to commute by car	41.6	25.4	32.9	21.4	27.1	51.4	60.2	19.5	20.3	51.5	29.4	19.1	60.7	26.2	13.1	59.0	26.2	14.8										

Source: author's work based on the survey research.

As opposed to the perceptions on advantages, the respondents associated commuting with moderate or low levels of disadvantages (table 3). There were statistically significant differences between respondents commuting by a particular mean of transport at the significance level $p < 0.05$ for all 15 variables relating to the various negative aspects of specific commuting modes. In general, long travel times due to traffic jams, waste of time and fatigue were considered to be the most significant drawback. However, car users also revealed financial costs and were aware (to some extent) of negative environmental consequences. Long-distance commuters and those using urban public transport tried to find ways to pass the time and had the least opportunities to rest after classes. What is important in this context is that most active commuters did not experience any disadvantages, whereas car users were the second group that paid least attention to the different negative aspects of commuting.

It is also worthwhile emphasising the fact that active commuters perceived the most advantages and the fewest disadvantages, whilst drivers and car passengers the fewest advantages but with very low levels of commuting disadvantages. However, both groups of respondents showed the highest satisfaction from their preferred ways of commuting (table 4), and were least likely to switch their chosen transport mode to a cheap and commonly available teleportation (assuming this would be possible after the pandemic). It turned out that multiple mode respondents and students commuting by regional public transport were the least satisfied groups and therefore teleportation would be most preferred by urban public transport passengers and multiple mode commuters. Non-car users were the most likely to demonstrate pro-social and pro-environmental transport attitudes, with active commuters being the most concerned about the local community and the environment as well as being least willing to incur additional costs for commuting by car. Car users, in turn, were most likely to pay more for their transport mode and were least likely to give up their current behaviour because of social or environmental concerns.

In the total sample, 47.8% (193) of respondents wanted remote studying to end as soon as possible, 28.2% (114) preferred to continue learning from home and 24% (97) were undecided. This means that almost 50% of the students were ready to “consume” commuting in the future. In the last part of the questionnaire, there were additional questions on opinions regarding future deconsumption of commuting to and from the university via teleportation. Students indicated their most likely and “dream” future means of transport. In all groups, the most likely future commuting mode was the same as before the pandemic. However, the respondents made different

choices regarding the hypothetical situation, if nothing would restrict them and they could choose the most desirable, “dream” transport mode (including teleportation). Although in the earlier part of the questionnaire the majority of students (57.6%) confirmed they would prefer to use teleportation rather than to commute after the pandemic (table 4), in general commuting by car turned out to be a more desired solution, (even compared to teleportation), especially among car users and passengers of urban public transport (table 5). Only multiple mode respondents preferred teleportation (35.4%) to using a car (26%), whereas for commuters using regional public transport these two “dream” modes had the same popularity rank (33.1% of answers given both to a car and teleportation). The most satisfied group of respondents, namely active commuters, would not like to change their transport behaviour. Whereas, walking and cycling (considered as the most sustainable transport modes), were the third-best “dream” transport modes among all respondents.

Table 5. The most likely and “dream” university commuting modes after the COVID-19 pandemic

The means of transport used to commute to the university in the future	Total opinions		Opinions of respondents commuting by a particular means of transport (%):									
			car		urban public transport		regional public transport		on foot/ bicycle		multiple modes	
	The most likely	Dream	The most likely	Dream	The most likely	Dream	The most likely	Dream	The most likely	Dream	The most likely	Dream
teleportation	0.0	31.0	0.0	34.7	0.0	29.1	0.0	33.1	0.0	25.0	0.0	35.4
car	28.6	32.8	69.7	50.8	19.5	34.2	28.3	33.1	22.0	19.7	14.6	26.0
urban public transport	28.5	9.3	13.8	4.8	57.1	19.4	10.4	5.9	14.0	3.0	18.8	4.7
regional public transport	8.2	2.6	1.8	0.8	1.3	0.4	38.7	7.6	6.0	2.3	2.1	3.9
walking or cycling	20.4	19.2	8.3	8.1	16.0	13.9	10.4	14.4	49.3	47.0	10.4	15.7
multiple modes	14.3	5.0	6.4	0.8	6.1	3.0	12.3	5.9	8.7	3.0	54.2	14.2

Source: author’s work based on the survey research.

Discussion

The findings relating to satisfaction with commuting by particular means of transport correspond to results obtained by Páez and Whalen (2010). However, these scholars placed an emphasis only on aspects related to travel (e.g. travel time or willingness to travel alone). There were no insights into the opinions of students as commuters to/from university. In other studies, next to car drivers, active commuters turned out to be the most satisfied transport users whilst urban public transport users were most often the least satisfied group or even unhappy with this way of travelling (e.g. Devi, 2017; Lades et al., 2020; Rissel et al., 2016; De Vos, 2018; De Vos et al., 2016, 2019; Shannon et al., 2006). To some extent, perceptions of its advantages and disadvantages can determine overall satisfaction with commuting by a given transport mode (Páez and Whalen, 2010; Mokhtarian and Salomon, 2001), and can play a key role in shaping more sustainable transport behaviour as travel experience and satisfaction are likely to influence e.g. decisions on car ownership and use (De Vos et al., 2016, 2019). This point is of relevance not only because active commuters are least likely to switch from walking to a car or even teleportation, but also in terms of the fairly large interest in walking/cycling as preferred modes of commuting after the pandemic among other groups of respondents.

Despite the opinions of active and multiple mode travellers, the results of this study reveal discrepancies between declared satisfaction with a transport mode, the perceived levels of advantages and disadvantages, as well as the “dream” means of commuting after the pandemic. For example, passengers of urban public transport were on average fairly content with their way of commuting. However, they also experienced low levels of benefits and moderate levels of drawbacks of commuting in this manner. Therefore, they remained most likely to switch from public transit to a car not choosing teleportation. Car users, in turn, did not think they largely benefited from or lost due to commuting, but were the second most satisfied group of commuters with the greatest tendency to use a car in the future, even if they were able to teleport to the university. These differences in the opinions stem from a variety of factors influencing mode choices (e.g. Zhou, 2012; Zhou et al., 2018; Cattaneo et al., 2018; Romanowska et al., 2019; Ramezani et al., 2018; Paradowska, 2014). In particular, distance and travel time, mode-specific costs, car availability and accessibility of alternatives to a car are considered the strongest factors (Zhou, 2012; Cattaneo et al., 2018; Romanowska et al., 2019; Lavery et al., 2013). For instance, many studies have shown that walking is the most popular choice for close distances, while the popularity of using a car dynamically increases over medium and long distances. Built-up environments with high availability of public transport make this transport

mode a convenient alternative to a car, especially when more and more restrictions on the use of cars are debated and implemented (Searcy et al., 2018; Lavery et al., 2013; Cattaneo et al., 2018; Romanowska et al., 2019; Vale et al., 2018). Moreover, long distance and extended travel time usually decrease overall satisfaction from commuting (e.g. Páez and Whalen, 2010; De Vos et al., 2016; Cattaneo et al., 2018). This finding can to some extent be reflected in the results obtained in this study in terms of respondents commuting by regional public transport and using multiple modes. Experiencing some advantages, for example extra time for learning before classes, resting after classes etc., can be related to a long travel time and willingness to simply fill the time available (e.g. Shaw et al., 2019; Mokhtarian et al., 2015; Singleton, 2018). As a previous study confirmed, car drivers perceive low levels of advantages resulting from travelling (Shaw et al., 2019). However, on the other hand, personal positive feelings related to driving, including a passion to drive or being emotionally attached to someone's own car can have a significant impact on "car addiction" (Steg et al., 2001a, 2001b; Steg, 2005). Similar effects derive from the fact that car travels satisfy significant transport demands to a higher extent (e.g. reliability, directness, comfort or independence, etc.) than other non-active transport modes (e.g. Cattaneo et al., 2018; Romanowska et al., 2019, Paradowska, 2020; Steg, 2003).

The above mentioned factors influencing high levels of satisfaction from commuting by car are probably key reasons for a high ranking of car transport as "dream" mode after the pandemic among respondents commuting by car as well as by those using urban and regional public transport. Analysis of the survey results also indicated that active commuters also gave a similar high ranking to walking/cycling as "dream" mode after the pandemic. Teleportation was considered a better option than a car only by multiple mode long distance commuters, which can be a consequence of higher stress levels and psychological fatigue related to driving long distances before and after a busy day at the university (e.g. Mokhtarian et al., 2015).

Last but not least, the findings also demonstrated a psychological gap between attitudes and actual behaviour/everyday decisions (e.g. Burgiel, 2020; Terlau and Hirsch, 2015; Jin et al., 2021; Prillwitz and Barr, 2011; Vincent, 2019) among respondents commuting by urban and regional public transport, and those using multiple modes. These groups of commuters tended to confirm a willingness and readiness to reduce/give up travelling by car to take more care of the environment and local communities. Likewise, they were not ready to incur additional costs for commuting by car. However, public transport users preferred commuting by car to the university rather than benefiting from affordable and easily available teleportation, whilst a car was the second-best "dream" means of transport among multiple mode commuters.

Conclusions

In this study, based on online survey research conducted one year after remote studying started, we investigated to what extent students perceived advantages and disadvantages of daily commuting to the university before the COVID-19 pandemic in the context both of satisfaction from the use of a distinct mode of transport and of attitudes towards more sustainable transport choices which could make possible future deconsumption in this area. Considering the findings, the following conclusions can be drawn:

Respondents associated commuting to the university with more advantages than disadvantages with statistically significant differences between students' perceptions about commuting by a distinct means of transport. In general, car users expressed low levels of advantages and moderate levels of disadvantages to commuting and active commuters turned out to be the most satisfied.

Non-car users, with active commuters in particular, declared the highest level of social and environmental concerns, as well as the greatest propensity to give up commuting by car in the future. Drivers and car passengers demonstrated the least pro-social and pro-ecological attitudes and were most likely to incur additional costs to commute by car.

Except for active commuters, perceptions on advantages and disadvantages of commuting, satisfaction with the means of transport, as well as pro-social and pro-environmental attitudes translated neither into a willingness to deconsume commuting in the future nor into more sustainable transport choices in a hypothetical situation of having access to a "dream" transport mode (even teleportation).

Most respondents confirmed they would prefer teleportation over continuously commuting to the university, which can be considered a propensity for deconsumption of transport processes. However, use of a car turned out to be the first, followed by teleportation as the second-best "dream" means of commuting among respondents who commuted by car or by urban public transport before the pandemic. Multiple mode commuters strongly preferred teleportation, while for respondents using regional public transport both car transport and teleportation were equally popular. Thus, sustainable mobility did not seem to be a "dream" alternative for young people entering their adult life. Only active commuters would keep to their original transport mode and behaviour. In the total sample, respondents considered a car a slightly better option than teleportation, while active commuting remained the third-best solution.

The results may be of a practical value and can have implications for policy making. These refer to three primary streams of public activities. First,

both universities and local authorities could strive to implement policies and cooperate actions supporting active commuting. Accessible solutions could be (for instance) provision of affordable accommodation near campuses, improvements in walking and cycling infrastructure, other incentives encouraging students to switch from motorised transport modes, promotion and education for sustainable development. Second, there is still a strategic necessity for improvements in public transport, especially in terms of its availability in regions with academic centres, travel time reduction, and enhancing multitasking possibilities. Separate bus and tram lanes or, more broadly, a thorough re-organisation of urban traffic could help reduce public transit delays due to traffic jams, which would increase its attractiveness. Free, high-bandwidth and safe wi-fi or less crowded vehicles would, in turn, offer better conditions for students and those who perceive commuting as a waste of time. Cheaper or free public transport for students could also be enforced as a measure to make university commuting more sustainable. Finally, more restrictions on commuting by car should be considered, discussed, and systematically implemented. Examples are limiting parking space, higher fees/charges for parking or street transformations into walking and cycling lanes, or by improving public transit infrastructure.

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