




Agnieszka Szmelter-Jarosz

 <https://orcid.org/0000-0002-6183-6114>

Department of Logistics
Faculty of Economics
University of Gdańsk, Sopot, Poland
a.szmelter@ug.edu.pl

Mobility choices of the Generation Y in Poland

doi: 10.22367/jem.2019.36.05

Accepted by Editor Ewa Ziemba | Received: November 10, 2018 | Revised: March 23, 2019 |
Accepted: March 29, 2019.

Abstract

Aim/purpose – The main objective of the paper is to explore mobility choices of Generation Y in Poland to check if they can be translated into guidelines for the development of mobility services.

Design/methodology/approach – In the paper, two research methods were used. First of them was an analysis of the literature related to Generation Y mobility according to Denyer & Tranfield (2009) approach. The main research method was the survey method. Respondents were recruited with use of purposive strategy and snowball approach. Data gathered in this study allowed for statistical analysis, mostly related to variables in ordinal and nominal scales.

Findings – The main findings concern the general priorities of Generation Y and gender differences. The study presents the relation of generational features and mobility behaviours, comparing them to those identified in the literature. The causes of such differences need to be widely discussed in the next papers, which draws some possible future research directions.

Research implications/limitations – A main limitation of the research is the chosen sampling strategy (non-random sampling) and risk related to non-inclusion of the important literature in the analysed database.

Originality/value/contribution – This research shows the characteristics of the Polish Generation Y's mobility choices. This is the first summary in the literature on this topic and can be used both by academic staff and practitioners. It extends the current literature by summarising available literature on the mobility of the young adults and results from different research methods, approaches, research procedures, research samples and geographical areas.

Keywords: Generation Y, young adults, mobility choices, Mobility-as-a-Service (MaaS), urban logistics.

JEL Classification: J11, O18, O52, R41.

1. Introduction

The modern economy operates in the so-called the reality of chaos, which is characterised by very high dynamics, sudden unexpected changes, trends, the emergence of new phenomena and paradigms (Zhao, 2014). It can be called Reality 4.0, which consists of many elements: Industry 4.0, Mobility 4.0, Media 4.0, Logistics 4.0, Transport 4.0, and which is characterised mainly by connectivity, autonomy of objects, automation and robotisation, real-time work, big data analysis and sustainable development (Szmelter, 2018). Today's logistics, including its part related to broadly understood mobility, cannot function properly without the integration of three dimensions: theory, practice and regulation. Interdisciplinary implications of logistics allow for applying its principles in any purposeful human activity (Chaberek, 2014).

Mobility 4.0 is a component of Logistics 4.0 (Brach, 2017; Szmelter, 2017). It is determined by a set of features, among which can be mentioned: value, flexibility, multi-channel sales, network, high resource efficiency, intermodality (Brach, 2017), it is therefore necessary to manage the flow of information efficiently because it usually precedes the flow of other types of resources (Weiland, 2018).

Socio-economic changes in the global economy (macro scale) cause a number of changes in the meso- and micro-scale, for example, in mobility in rural, suburban and urban areas (Haustein & Nielsen, 2016). Sustainable mobility in city areas mainly includes shifting the demand from motorised mobility to eco-friendly one, preferably to public transport (Spickermann, Grienitz, & von der Gracht, 2014). However, taking into account the characteristics of this demand and ubiquitous car culture (Szmelter, 2018), it becomes impossible to encourage residents of urban areas to abandon their cars (Haustein & Nielsen, 2016). The introduction of Mobility-as-a-Service (MaaS) services has been a solution to this problem (Szmelter, 2018). They are aimed not only at achieving environmental goals, e.g. by eliminating congestion and its external costs, but also including the social and sustainable development of urban areas (balanced spatial economy). In addition, lifestyle changes and generational changes create many challenges for the mobility service providers and further intensify the need to shift the demand for mobility services towards sustainable urban mobility (Hopkins, 2017).

This paper is based on detailed, qualitative surveys conducted in Poland between March and May 2018 and was aimed at identification of mobility choices among so-called young adults, mainly described as the Generation Y (Y's, Gen Y, Millennials). Consequently, the goal of this paper is to respond to two research questions:

RQ1: What are the mobility choices of Polish Generation Y?

RQ2: Can Generation Y change the current mobility market in Poland?

To the researcher's best knowledge, there is no paper on young Poles mobility choices in the existing literature, although there are available sources related to the issue of public transport choices, learn-to-drive attitudes and other detailed fragments of studied here research problem of mobility choices. However, there is no similar, complex approach to this topic. The author tries to fill this literature gap by presenting the research results and comparing them to those identified for other nations.

The paper is organised as follows. The first section gives a review of the literature on the studied topic, according to the chosen literature review procedure, search engine and search criteria. The second part of the paper presents the methodology of the main research, which was an online survey. The third section contains research results. The central part of this section is a statistical analysis of the collected data. The next section discusses the research results. The final, the last part concluding the paper presents its limitations and specifies future research directions.

2. Literature review

2.1. Procedure

The part of the literature review was preliminary research for designing the questionnaire and conducting a survey, so the author decided to use the chosen approach to objectify the whole research and make it possible to be repeated by other researchers. The author chose a qualitative literature review procedure proposed by Denyer & Tranfield (2009). Their approach is mainly based on the sequence of steps needed to be taken to compose a reliable literature database. However, the author made some modifications in the original procedure. Firstly, one search engine was used (multi-source search engine EDS on the EBSCOhost platform). Secondly, to determine primary literature, the Boolean logic was used and the research inclusion criteria were as follows:

1. First search: ‘mobility market’ in the abstract.
2. Second search: ‘mobility’ in the abstract and ‘young adults’ or ‘Generation Y’ in the text.
3. Third search: ‘Generation Y’ and ‘mobility’ in the abstract.
4. Fourth search: ‘Poland or Polish’ in title, ‘mobility’ in the abstract, ‘transport’ in the text.

For all search rounds, the author defined the field of knowledge (management or business or economics or geography), publication date (from 2010). Only full-text records were considered. After that, abstracts and then, text analysis was carried out. This primary literature database was extended by the sources on the particular matter found in the analysed papers. Finally, 24 papers were analysed to address the central issue of this paper.

2.2. Results

The primary goal of mobility management in the city is achieving the high quality of life of residents. The role of local authorities is to ensure it by the implementation of sustainable urban mobility plans (SUMP). Urban mobility systems also have the task of bridging the gap between individual generations in accessing mobility solutions (de Freitas Miranda & Rodrigues da Silva, 2012). To compare cities with each other, the Index of Sustainable Urban Mobility was created, with individual cities form their SUMP, in Poland, they operate the National Urban Policy 2023 (in Polish: Krajowa Polityka Miejska 2023; Orłowski et al., 2015). The priorities of this strategy are investing in the (tele)communication system, changing the communication with passengers, organising and managing the traffic, and increasing the capacity of freight transport. Theoretical issues discussed in this paper are related to the passenger urban transport, in which Kalisiak-Mędelka (2017) lists such possible logistical activities as the implementation of urban bike or electric city cars rental systems and mobile applications with real-time communication with passengers.

In the identified literature database, the review papers on different topics can be mentioned, among others about solutions in the field of urban studies education (Pink & Noblit, eds., 2017); car sharing systems (Glotz-Richter, 2016), bike-sharing and motorbike-sharing systems (Engelmoer, 2012), the emergence of new mobility patterns, and their influence on spatial urban configuration (Cavallo, Smossa, Marzot, Berghauser Pont, & Kuijper, 2014, Camagni, Cristina, & Rigamonti, 2002). The second type of publications are

works on mobility solutions in specific regional areas, namely in Curitiba in Brazil (de Freitas Miranda & Rodrigues da Silva, 2012), Johannesburg in the Republic of South Africa (Wilhelm-Solomon, Núñez, Kankonde, & Malcolmess, 2016), Spain (Diez, Gonzalo, Velasco, & Lopez-Lambas, 2013), Gdańsk in Poland and Gothenburg in Sweden (Chaberek-Karwacka, 2017); Basel in Switzerland (Becker, Ciari, & Axhausen, 2017), Bremen in Germany (Glotz-Richter, 2016), Gdynia in Poland (Hebel, 2016; Okraszewska, Romanowska, Wołek, Oskarbski, Birr, & Jamroz, 2018), and finally, complex analyses: for 231 European cities (Schwarz, 2010) or 28 European countries (Haustein & Nielsen, 2016).

The analysis of the literature allowed to identify the fundamental conclusions about modern mobility. Private road transport is still the dominant one in the area of mass transport solutions (Hopkins, 2016) and due to the strongly developed car culture and the phenomenon of ‘peak travel’ (van Wee, 2015) and ‘peak car’ (Goodwin, 2012) it will not change quickly. According to Metz (2010), the average distance travelled is about 7,000 miles per person per year and it is stabilised, that is why the ‘peak car’ or ‘peak travel’ can be confirmed for some countries, especially for so-called advanced, well-developed economies. Changing habits in the field of choosing a mode of transport is very slow, especially because the car is the most comfortable means of transport. For this reason, it is essential to provide other possibilities, also the multi-modal ones, so that user’s requirements are met when achieving goals of the sustainable urban mobility.

MaaS services related to car use are being introduced to the market. Among them, the most popular services are free-floating car sharing systems (Becker et al., 2017). Their idea is to allow the user to rent a car from any place within the city area and also to leave it anywhere he wants. However, as argued by Becker et al. (2017), it is still unclear how the growth of this MaaS segment affects the overall travel behaviour. An alternative to such systems are station-based ones, less flexible, in which the customer has to start and end the travel in designated places (stations). Admittedly, they do not ensure the full freedom of car leaving, but are based on a dense network of places where the car can be picked up. In the survey conducted by Becker et al. (2017) it appeared that 70% of the free-floating car-sharing members in Basel are male, compared to 60% for the station-based car-sharing services. In their study, men were also more likely to have a driving license than women (55%).

Several papers were intended to verify so-called ‘mobility cultures’ (Haustein & Nielsen, 2016) or, in other words – ‘mobility patterns’ or ‘mobility choices’ (Szmelter & Woźniak, 2016), which are sets of attitudes and variables

resulting in making decisions in the area of mobility. They are defined as specific socio-cultural settings, including travel patterns. That is why the theory of planned behaviour can be used for the study on mobility choices, in other words, customer behaviour aimed at achieving a goal (fulfilling mobility requirement) and making decisions according to one's system of preferences (Chong et al., 2013).

The Generation Y is defined differently in various literature sources, and the origin of generational cohorts' analysis was initiated in the field of human resources management research. Then, it was extrapolated to other science areas because it was noticed that these groups differ substantially from each other. In this research, the Generation Y is described as a group of people born between 1981 and 1999, and, in fact, this is the largest generation in many countries (Hopkins, 2016), also in Poland (ca. 10 million people in 2017; GUS, 2018). In most sources about transportation and mobility, it is characterised as an environmentally conscious generation, although some defined literature sources deny this thesis. Hopkins & Stephenson (2014) argue that "the generation Y mobility changes could present an opportunity to facilitate a transition towards a more sustainable mobility paradigm". Hopkins (2016) concludes her research that not only environmental awareness led young people to choose more eco-friendly means of transport, but also a complex set of socio-cultural, economic and structural factors. Respondents with no driving license were more environmentally aware than those having the license. Also, Uba & Chatzidakis (2014) noticed some correlation between young adults' mobility and lifestyle and environmental awareness regarding motorised mobility. In turn, Tilley and Houston (2016) argue that women travel shorter distances and are more likely to be employed closer to their houses and in part-time work. Additionally, they more often have to travel with children (to nursery, school, pre-school), so make a greater number of trips. In addition, women are more likely to cycle and walk, even if they have a driver license.

Also, Tilley, & Houston (2016) made an analysis of the literature about birth cohorts and the differences in their mobility. Firstly, mobility depends on the life stage (higher among younger people, lower in the group of older people), which can lead to social exclusion. Their research shows several conclusions:

1. Men travel longer distances except for a group of people under 20 years of age.
2. Women aged under 30 have higher weekly mobility than men in the same age.
3. Among men, it is at the same level, although in the case of male Y's it is declining.

4. Both genders present the highest mobility in their ‘mid-life’ stage, which is when they are aged 30-40 years old.
5. Generation Y men travel less than men of the prime working age (31-42), and pre-1936 cohorts travel less than Generation Y men.
6. Low mobility of Generation Y only applies to men, as women of this cohort are as mobile as women of prime working age.

In other studies, some more implications to this matter were added, for example, increase in non-motorised travels and decrease in the total length of travel and number of driver licenses ratio (Hopkins & Stephenson, 2014; Tomanek, 2017).

The broad analysis of the literature before 2010 about the mobility of Generation Y was also made by Hopkins (2016).

The literature analysis allowed for drawing a clear conclusion: the definition of the mobility market is obvious – it is the place where the supply of mobility meets the demand. The demand for mobility is very complex, and as it was mentioned, depends on a complex set of variables on the socio-economic character.

Mobility market in Poland is not so well-developed as in other countries (Germany, the Netherlands, USA), but it is developing rapidly because the number of the new players and new business models is increasing to the extent that some main global players are involved in providing their services on the Polish market (Table 1).

Table 1. Characteristics of MaaS services related to car use

Type	Model and year of the first offer in Poland	Description	T*	F*	D*	Examples in Poland
1	2	3	4	5	6	7
Traditional	Car rentals (ca. 1990)	Renting a car for a predetermined number of days	D	H	L	Many
	Taxis (ca. 1910)	Point-to-point transport of passengers	M	M	S,M	Many
	Carpooling/ carsharing (n.a.), bikesharing (n.a.)	Transport of riders by a non-professional driver based on fixed schedule departure and close destinations of co-riders	M,H	M	M,L	Private car use (individual)
	Microtransit (ca. 1995)	Transport of riders by small busses according to schedule or on demand	M,H	M	S,M	Many
New	E-hailing (lift-sharing) and ride splitting (2013)	On-demand hiring a private car by a group of riders (using an application and an electronic device)	M	H	S,M	Uber
	B2C car sharing, (2016)	On-demand short-term car rentals from its owner (fleet operator)	M,H	M	S,M	Traficar, 4Mobility

Table 1 cont.

1	2	3	4	5	6	7
	Carpooling 2.0 (2005)	Carpooling with the use of a virtual application and an electronic device	M	M	S,M, L	BlaBlaCar
	Taxi 2.0 (2005)	Ordering a taxi with the use of a virtual application and an electronic device	M	M	S,M	EcoCar, mytaxi, iTaxi, Taxify
	Scooter rental/sharing (2017)	On-demand short-term scooter rental from the fleet owner (public or private)	M	M	S	Blinkee, Sroot, JedenŚlad

* T – time: M – minutes, H – hours, D – days; F – flexibility: H – high, M – medium, L – low; D – Distance: L – long; M – medium; S – short.

In the research of Schwarz (2010) analysing 231 cities in Europe, within the PLUREL (Peri-urban Land Use Relationships) project, 23 Polish cities were examined. According to this study, they were qualified as similar to German, Italian and French studied cities by use of cluster analysis. Unfortunately, in this research, no specific research conclusions were explicitly drawn for Polish cities. They represented higher than average population number, higher area of discontinuous urban fabric and a high number of patches. These specificities hinted at a scattered, low-density spatial development.

According to Hausteijn and Nielsen (2016), Polish people are more oriented to public transport use than other nations. In the Flash Eurobarometer (European Commission, 2011), the ratio of car individual transport was one of the lowest in the European Union, and it was ca. 43%, then public transportation (PT) at the level of 31% (one of the highest in EU28) and non-motorised at 26%. In the other paper, the research of Beim (2011) carried out for Wrocław, 43% of residents used a car, 35% use the PT (bus, tram or both), bike (4%) and 18% on foot. In the analysis conducted by Hebel (2016) of Gdynia residents in 2008, 2010 and 2013, there is an explicit confirmation of previously presented results. According to this paper, in 2013, 28.35% travels were made only by use of the public transport, 30% usually by PT or equally by PT and by car, and 41.35% mostly or always by car. Also, the travel time increased in the studied period (Hebel, 2016).

3. Research methodology

3.1. Method

The main research method was the survey method, namely an online survey with the use of a questionnaire. This questionnaire contained closed (dominating), open, semi-open questions and scale questions, regarding attitudes, behav-

hours and opinions. The questions were modelled on the available interview sheets, and questionnaires in the current literature on the mobility of young adults also called the Generation Y, and if that was impossible to reach these questionnaires in the selected literature – based on the research results and conclusions described in these papers (Hopkins, 2016; Hopkins & Stephenson, 2014; Kuhnimhof, Buehler, Wirtz, & Kalinowska, 2012; Oakil, Manting, & Nijland, 2016; Parment, 2013; Simons et al., 2014). Conducting a survey among the representatives of Generation Y was preceded by a pilot study among a purposefully selected group of 42 people born in 1997. After this study, corrections were made to the questionnaire to increase the clarity of questions and answer variants for respondents in the main study.

The surveyed persons were recruited with use of a purposive strategy (Mason, 2002; Patton, 2002) based on the inclusion criteria that the participant should be born between 1981 and 1998 and be a Polish citizen. As an additional approach, a snowball sampling method (Mazurek-Łopacińska, 2016) was used to increase the number of participants because random sampling procedure in the case of this study was difficult to implement. The survey was held from March to May 2018. Aggregated details for the research sample are presented in Table 2; 319 people took part in the survey.

Table 2. Characteristics of the research sample

Category	Result
Year of birth	1981-1990 – 10.58%; 1991-1999 – 88.79%
Sex	Female – 62.50%; Male – 37.50%
Student status	Bachelor students – 71.47%; Master students – 13.46%; Doctoral students – 0.64%; Graduate – 13.78%. Non-student – 0.64%
Personal status	Single – 41.03%; in a relationship – 52.56%; married – 6.41%
Place of residence	City 500.000 p or more – 17.95%; City 200.000-500.000 p – 38.46%; City 100.000-200.000 p – 7.05%; City 50.000-100.000 p – 8.97%; City less than 50.000 p – 17.31%; Countryside. suburban zone – 6.09%; Countryside – 4.17%
Housing status	Own flat/house (without mortgage) – 6.09%; Own flat/house (mortgage) – 4.49%; Flat/house owned by family – 34.62%; Rented flat – 48.08%. Dormitory – 6.73%
Household size	One person – 6.73%; Two persons – 40.71%; Three. four or five persons – 48.40%; More than 5 – 4.17%
Children in the household (0-16 years old)	Yes – 10.26%; No – 89.74%
Monthly income per person	500 PLN or less – 3.85%; 500-1000 PLN – 11.54%; 1000-1500 PLN – 19.23%; 1500-2000 PLN – 22.44%; 2000-3000 PLN – 19.55%; 3000-5000 PLN – 16.35%; more than 5000 – 7.05%

3.2. Data analysis

The data collected while conducting the survey were mainly qualitative, two- or multi-level data. Variables were described on nominal and ordinal scales (Table 3). The set of variables were divided into the classes of variables: general information (variables 1 and 2), priorities (variables 3 and 4) and the widest group – opinions (variables 5-22). Priorities and opinions were to serve as a basis for comparisons and discussion with the other research results mentioned in the identified literature database.

Table 3. List of variables

No.	Variable name	Variable class	No.	Variable name	Variable class
1	Length of daily travel	General	12	Having a car is important for me	Opinions (cont.)
2	PT use frequency		13	Launching Uber and similar solutions is good	
3	Taking care of the environment	Priorities	14	I like the concept of car sharing	
4	The high quality of life		15	If public transport offers public car rental, I would use it	
5	Cars should be eco-friendly	Opinions	16	There should be zero- and low-emission cars in the city area	
6	Cars – fuel should be eco-friendly		17	City bike and train is a good combination for urban journeys	
7	I prefer a car than other means		18	Public car rental will not work in Poland	
8	Thanks to the car you can get to the chosen place much faster than other means of transport		19	I mostly complain about the lack of punctuality of PT	
9	Car – enables self-realisation		20	Crowd bothers me in PT	
10	Car – enables reaching the higher level of happiness		21	If there was a city car in the PT offer, I would give up driving my own car	
11	Having a car license is not important		22	If the city centre was forbidden for private cars, I would prefer to use a city car rather than a bus or a tram	

Because of the character of the variables (nominal and ordinal), as the first, simple descriptive statistics were used to characterise the surveyed group and present some general results for young adults as one group. Finally, to verify the possible differences between groups of people, the test for two independent groups, nonparametric one, namely the Mann–Whitney U test was held. An auxiliary tool for data analysis was contingency tables. All the data were analysed with use of the Statistica 13 software. Only data for urban and suburban areas residents were taken into account in this research (312 filled questionnaires).

4. Research findings/results

This part of the paper presents the results of the research. The individual percentages and coefficients are presented in the tables below (Tables 4, 5 and 6).

As it results from the survey, the vast majority of Y's had a driving license, although a significantly higher percentage of license holders occurred among men (chi-sq test with $p = 0.000$, 92.31% of the male respondents) than women (86.15%). This partially confirms the research results of other researchers, which is indicated in the discussion part. Despite this difference in gender learn-to-drive attitudes, every year the gender driving gap decreases in Poland.

Table 4. Characteristics of the mobility choices of the surveyed people

Driving license	Yes		No, but intend to do	No, not intend to do		
	88.14%		7.69%	3.85%		
Using a car	Own car	Someone else's car	Company car		No car	
	28.53%	29.81%	2.56%		38.78%	
Main means of transport	Car	Taxi	Bus	Tram	City fast rail	Regional rail
	36.22%	0.32%	20.83%	7.05%	23.08%	3.21%
Means of transport generally used	Car	Taxi	Bus	Tram	City fast rail	Regional rail
	70.51%	24.68%	63.78%	43.27%	68.59%	24.36%
Daily time of travel	Less than 1 hour		1-2 hours	2-3 hours	More than 3 hours	
	53.53%		36.86%	7.69%	1.60%	
Use of public transport	Every day	2-3 times a week	Once a week	Once a month	Less than once a month	At all
	49.04%	19.55%	7.69%	9.62%	9.62%	4.17%

Approximately 60% of the respondents use their own car or a car belonging to a family member or partner. Men (37.61%) definitely own car more often than women (23.59%), while women (36.92%) significantly more often used a car belonging to someone else than men (17.95%). The choice of the main means of transport was also statistically significantly correlated with gender. Men more often used a car (45.3%) than women (31.29%), and women – a taxi, bus and tram.

Table 5. Chi-square test results

Variable	Having a driver license		Using a car		Means of transport		Using mobile applications (MaaS)	
	Chi-sq	p	Chi-sq	p	Chi-sq	p	Chi-sq	p
Gender	315.721	$p = 0.000$	335.422	$p = 0.000$	326.072	$p = 0.000$	0.686	$p = .709$

38.78% of respondents do not have own car and do not use the car owned by someone else. These people declared using public transport (PT) as the main mode of transport. In the surveyed group, 53.17% uses various means of public transport, including most often the bus (20.83%) and fast city rail (23.08%). Nevertheless, the majority of respondents use various means of transport. They usually travel less than 1 hour daily (53.53%) or 1-2 hours (36.86%). Almost half of the respondents declared using public transport on a daily basis. Young people also use mobile applications to plan their trips (55.90% of the surveyed women and 60.68% of men). Chi-square test did not indicate statistically significant differences in this field by both genders. In turn, in the case of opinion about PT (variable 20), U test indicated significant differences in the answers for both genders (Table 7). 40.58% of people complain about the lack of punctuality of public transport (45.64% of women and 32.48% of men).

Table 6. Correlation analysis (gender vs. 1-22 variables) – Kendall's tau coefficients and high rate ratio

Variable	High rate ratio*	Coefficient	Variable	Coefficient	High rate ratio
1	–	0.039877	12	0.011758	18.85%
2	–	0.091308	13	0.075801	77.00%
3	29.71%	-0.264369	14	0.095799	69.01%
4	25.24%	0.038929	15	0.054448	33.55%
5	50.80%	-0.248889	16	-0.155880	31.31%
6	59.11%	-0.206081	17	-0.016536	71.88%
7	68.05%	-0.039456	18	0.046159	26.20%
8	64.86%	-0.011739	19	-0.119012	40.58%
9	54.63%	0.042841	20	-0.060898	54.31%
10	44.41%	0.082693	21	0.006398	10.22%
11	15.65%	-0.001466	22	0.065553	30.99%

* High rate ratio means 7-10 in 10-scale and 4-5 in 5-scale.

Mann–Whitney U test indicated the differences between the genders in the field of caring for the environment and the requirements for transport measures in this regard. Statistically significant differences were observed in the case of variables number 3,6,16, which were three out of four correlated with this topic (non-significant differences were found for variable 4, which was highly rated by 25,24% of respondents. In the case of the variable 3, 36.39% women highly rated the need to introduce environmentally friendly vehicles in their own hierarchy of values (score 7-10 on a scale of 1-10, 20.51% of men), 67.18% of women think that there is a need to introduce cars fuelled with renewable raw materials (46.15% of men, 59.11% in total), for 34.36% introduction of zero-

-emission and low-emission cars in the city is a must (26.50% of men, 31.31% in total). The test also indicated significant differences in the case of variable 6. In the case of the first of these essential variables, 50.8% of respondents rated the high importance of high quality of life for themselves (53.85% of men and 49.23% of women).

Table 7. Results of the test for two independent groups (Mann–Whitney U test)

Signification	U	Z	p	Z (corr.)	p	Group 1	Group 2
1	11056.50	-0.45436	0.649573	-0.51011	0.609975	195	117
2	10281.00	-1.45964	0.144389	-1.56289	0.118080	195	117
3	8420.50	3.87142	0.000108	3.90295	0.000095	195	117
4	10949.00	-0.59371	0.552707	-0.59865	0.549406	195	117
5	7629.50	4.89680	0.000001	5.07700	0.000000	195	117
6	8256.00	4.08467	0.000044	4.23660	0.000023	195	117
7	10698.00	0.91908	0.358053	0.97852	0.327818	195	117
8	11083.50	0.41936	0.674957	0.43811	0.661305	195	117
9	10935.00	-0.61186	0.540633	-0.63279	0.526872	195	117
10	10342.00	-1.38057	0.167413	-1.42334	0.154638	195	117
11	11231.50	0.22750	0.820034	0.24797	0.804157	195	117
12	11391.00	-0.02074	0.983452	-0.02144	0.982892	195	117
13	10524.00	-1.14464	0.252359	-1.22417	0.220889	195	117
14	10198.50	-1.56659	0.117212	-1.64291	0.100403	195	117
15	10754.50	-0.84584	0.397642	-0.86908	0.384802	195	117
16	8927.00	3.21484	0.001305	3.29839	0.000973	195	117
17	11018.50	0.50362	0.614532	0.53117	0.595303	195	117
18	10880.50	-0.68251	0.494919	-0.70263	0.482288	195	117
19	9470.00	2.51095	0.012041	2.57041	0.010158	195	117
20	10357.00	1.36112	0.173476	1.40446	0.160182	195	117
21	11341.50	0.08491	0.932334	0.08990	0.928368	195	117
22	10581.00	-1.07075	0.284282	-1.09553	0.273285	195	117

Analysing the remaining variables (Table 6 and Table 7), the remaining results for the studied group can be noticed, as follows:

1. 68.05% of respondents prefer the car more than other means of transport, and 64.86% say that thanks to using the car everyone can reach the chosen place.
2. Only 15% think that having a driving license is not essential in life, but only 18.85% that is owning a car is important to them.
3. The vast majority likes the concept of car sharing (69.01%) and 77% thinks that the introduction of Uber and similar is good.
4. Only 10.22% would give up using their own car in favour of a rented so-called public car, only 26.2% thinks that this concept would not work in Poland, but 33.55% declares their willingness to use such solutions and 30.99% would use such a car if it were forbidden to enter private cars into the city.

Young adults showed a relatively high interest in the car as the main means of transport. However, more often, despite having a driving license, they use public transport. Therefore, it should be clearly stated that the means of transport within public transport are the dominant element of Generation Y mobility patterns. The mobility choices of the young generation clearly indicate a low attachment to the driving license, lack of identification with the car itself, which may affect the creation of completely new transport behaviour than in the case of people being now 40 and more years old.

The results of the study clearly point that the Polish Generation Y in part replicates patterns borrowed from previous generations, but is more focused on green solutions (especially women), or at least says so. However, in this lower, but still high attachment to the car as the preferred means of transport, one can see opportunities for the development of pro-ecological solutions in the field of urban mobility management, such as the introduction of sharing economy solutions, electric mobility, or multimodal solutions (e.g. park & drive). The surveyed group shows a high propensity to use new solutions in the field of mobility (public car, shared mobility) and New Mobility Services, e.g. Uber. This indicates that they would be very keen to use it or similar solutions, which will undoubtedly cause changes in the mobility market in Poland, especially in the area of private motorised mobility. These changes are visible in two areas: the tendency to use shared mobility services and the use of other means of transport rather than the car (including multimodality).

5. Discussion

The results of the survey made it possible to analyse the choices regarding mobility for people born and living in Poland and aged 19-37. Still, the car is one of the main means of transport. What is more, a high percentage of people using public transport can be noticed. In addition, the flexibility of Generation Y in switching modes (multimodality) and high awareness of the need to care for the environment will significantly affect changes in the mobility market in Poland.

Today, among others because of the generational changes, new mobility patterns (Szmelter & Woźniak, 2016) and mobility cultures (Haustein & Nielsen, 2016) are shaping, which were also mentioned primarily by Cavallo et al. (2014). The peak travel (van Wee, 2015; Goodwin, 2012) still exists and is true. Changes in the mentioned areas, however, are difficult to predict, as indicated by Becker et al. (2017). In this study, the research results of Hopkins

(2016) and Uba & Chatzidakis (2014) on the high ecological awareness of young adults in the area of mobility were also partially confirmed. It turned out that young people care about the quality of life, which is confirmed by the study de Freitas Miranda & Rodrigues da Silva (2012), Diez et al. (2013) and is the main aim of any SUMP. There were also differences between the genders in this area, which also, to some extent, relates to the Tilley & Houston study (2016). For men, high quality of life is more important and they use a car more often than women. However, women, even though they also mostly have a driving license, more often opt for public transport and are more ecologically aware. Nevertheless, the studies of Haustein & Nielsen (2016) should still be reviewed in order to confirm or deny the high percentage of the Polish population using PT in comparison with other countries. The differences in this field are noticeable, taking into account the percentages of the urban population using PT, but there are not any confirmed statistically important differences between examined nations.

So, will Generation Y in Poland change the mobility market? According to the research results of this study, this is already happening. The positive attitude to car-sharing in the surveyed group may indicate that the Polish reality is more and more similar to the ones described for other countries (mentioned in the Literature review section) and will very likely contribute to the change of the way the city functions, including modifying its elements (Glotz-Richter, 2016). Changes in transport, especially in cities, should strive to increase the attractiveness of public transport. There are many fields to improve in this area. Young people complain about the lack of punctuality of the PT, which may result from the incorrect resource planning, poorly designed infrastructure (Chaberek-Karwacka, 2017) or insufficient level of ‘intelligence’ of the city or another geographical area (Brdulak, 2017). These problems are addressed by logistics – specifically the urban logistics and, especially, the information logistics.

Revolution 4.0, and its part – the evolution of logistics to the Logistics 4.0, should mainly cover many areas of the mobility market in Poland (Szmelter, 2018) to respond to challenges, including requirements of the dominant generation in the society, which is Generation Y (Stough, 2017). This will also take place through the use of MaaS services, which are very well known among Polish Generation Y, and also, the new ways of renting equipment such as bike sharing and motorbike sharing systems (Szmelter, 2018). The popularity of MaaS services will rise in the future, especially when the purchasing power of this cohort will multiply in the next decades.

This analysis should be broadened by using some additional analysis methods to precisely define the patterns of mobility of the Polish Generation Y, referring to the classifications presented in the mentioned sources (especially Camagni et al., 2002; Cavallo et al., 2014; Haustein & Nielsen, 2016; Szmelter & Woźniak 2016).

6. Conclusions

This research showed the characteristics of the Generation Y's mobility choices in Poland. It extends current literature by summarising available literature on the mobility of the young adults and results from different research methods, approaches, research procedures, research samples and geographical areas. In addition, it describes the priorities and attitudes of Polish young adults. There was a literature gap for similar analyses. After preparing, carrying out the research and presenting the results, it still exists and needs further studies to be filled, both in Poland and other countries. The author plans to continue the data analysis in order to prepare a complex description of mobility patterns of Polish Generation Y and to specify the directions for future mobility market offer development.

The results of this study contribute to mobility studies, especially in the European research market. They can be useful for both by academic staff and practitioners (to verify and extend their market offers). Researchers can use the results of this study for repetition of a similar survey in other countries in different world regions to compare the mobility preferences of Generation Y (especially urban residents) and to determine what differences and similarities exist in this area. The practitioners, especially PT managers in Polish cities, local authorities, and managers in private mobility service providers, will benefit from this study by gaining valuable information about their current or potential customers – their choices, needs and preferences. With this information, they can revise and verify their current market offer, compare it with the offers of competitors, monitor the mobility market and consider extending the service portfolio with new items.

The author is aware that this research has a few limitations. Firstly, the literature research method concerns only papers with particular search criteria, and despite the mentioned extension, there is a risk of omitting some crucial research results in the studied field. Secondly, using purposive, non-random sampling study indicates only some possible results in the studied population, and the

level of occurrence of particular mobility choices may significantly differ from that in the studied sample. Nevertheless, the random sampling method in the case of this research would be very hard to implement.

Despite these limitations, the described research results are promising and provide many future research possibilities, can also serve as a basis for further studies. Future research should be conducted to obtain more data on Generation Y mobility patterns and compare those results with other researchers' approaches, existing Sustainable Urban Mobility Plans, local authorities' activities and strategies. The author hopes that these and many other issues in the area of generations' mobility should be addressed in the near future in both theoretical and empirical research.

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