

Socio-economic Status and Biological Characteristics of Students from Generation Z in France, Slovakia and Poland

*Ewa Frąckiewicz¹ , Ewa Rębacz-Maron² , Rafał Czyżycki³ 
Ghislaine Pellat⁴ , Jana Marasová⁵ *

¹ Institute of Management, University of Szczecin, Szczecin, Poland; ² Department of Ecology and Anthropology, Institute of Biology, University of Szczecin, Szczecin, Poland; ³ Institute of Spatial Management and Socio-Economic Geography, University of Szczecin, Szczecin, Poland; ⁴ Institut Universitaire de Technologie 2, Université Grenoble Alpes, Grenoble, France; ⁵ Faculty of Economics, Matej Bel University, Banská Bystrica, Slovakia

ABSTRACT: Generation Z, unlike any generation before them, lives in an era of rapid and global technological change, where most activities take place online. This lifestyle has significant implications for the well-being and health of internet users. The question is whether the contemporary socio-economic status (SES) and biological profile of Generation Z ‘immersed’ in new technologies is a universal phenomenon, independent of the country of residence. This study sets out to identify similarities and differences in the socio-economic and biological characteristics of Generation Z students from three European Union countries. Data were collected directly in France, Slovakia, and Poland. We used a survey questionnaire and non-invasive anthropometric measurements in Generation Z respondents (n=157). Our results show that there is a significant relationship between country of residence and three SES indicators: income, self-rated financial situation and time spent online, as well as three biological measures: body mass index (BMI), relative fat mass (RFM) and waist circumference (WC). Country of residence only partly explains the similarities and differences in the socio-economic status and biological characteristics of Generation Z students. In terms of SES, the participants’ profile is significantly influenced by financial situation, i.e. the student’s monthly disposable income and self-assessed financial situation, as well as time spent online. In turn, for biological factors, the significant measures are: BMI, RFM and WC.

KEYWORDS: SES, waist circumference, BMI, RFM, dynamometry, EU countries



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Introduction

People of the same generation tend to share a similar outlook and, as they mature, they develop certain distinctiveness that makes them different from previous generations: behaviors, work ethics, attitudes, learning and motivational skills (Yadav et al. 2017). Generational studies are based on K. Mannheim's classic 1928 concept of cohorts (1952). Mannheim defined a generation as a group of people with common experiences, such as having lived through important historical events, having a similar position in society, or sharing a similar living space. The main argument in favor of a generational approach to research is therefore that each cohort has similar patterns of behaviour in terms of work, leisure and consumption (Barron et al. 2017).

The global prevalence of obesity has almost tripled since 1975, mainly due to increasingly sedentary lifestyles and less healthy diets. In May 2022, the WHO released its latest update on the obesity pandemic in Europe, reporting that 60% of European citizens are either overweight or obese, and highlighting the impact of the obesity pandemic (Boutari et al. 2022).

One measure that can be used to assess the well-being of an individual or group of individuals is socio-economic status (SES) (Sahni et al. 2017). SES is defined by indicators such as occupational status, income level, educational attainment, lifestyle, leisure activities among others. In our investigation of the characteristics of Generation Z, we made two assumptions: place of residence – EU countries, and type of activity – university students of economics.

Generation Z is made up of people who were born between the mid-1990s and 2010 (Lavickaite 2010; Goh et al.

2018), although there is no exact date range. In 2015, one in six people in the world belonged to Generation Z, with an age range of 15 to 24 years (World Populations Prospects 2022). In the European Union, on the other hand, almost 11% of the population could be classified as Generation Z in the year of this study, which corresponds to around 49 million people (Eurostat calculations of the percentage of people aged 15–24).

When describing Generation Z, their immersion in new technologies and constant online presence are highlighted as key characteristics (Kall 2015). No previous generation has lived in an era where technology has changed at such a rapid pace and been so readily available to young people (Turner 2015). In new technologies, Generation Z finds ways to have fun, learn, relax and connect with others.

Generation Z is perceived as a distinct generation, largely due to their relationship with modern technologies. They are also known as 'digital natives', 'zoomers', the 'net generation', 'generation next' or 'generation C' (connected), the 'Facebook generation', and the first truly global generation. It is a generation of university students these days, but soon they will become the leading workforce (Mladkova 2017). Generation Z will most likely make more intensive and more efficient use of new technologies in their own work and in their careers than their older colleagues. The use of the internet in almost every aspect of life provides Generation Z with tremendous opportunities to gain knowledge, skills and information. It is difficult to predict now how such widespread use of digital tools will affect their professional development, their personal lives and whether it will affect their health. On the one hand, it is predicted that, in the near future, higher paid jobs

will involve the use of new technologies and that using them will become a down-right necessity (World Economic Forum 2023). Digital skills gaps will undermine earning capacity, increasing social stress (Lin et al. 2017; Stark 2023). On the other hand, a growing number of authors are drawing attention to the adverse health effects associated with excessive use of new technologies, including the problems of sedentary behavior and obesity. Excess body fat is particularly dangerous as it has been implicated as a causative factor in a number of lifestyle diseases (Ashwell et al. 1996; 2014). Obesity, which can be caused by too much sugar in the diet, too little physical activity, chronic stress and too little sleep, is a particular threat to Generation Z because of their almost constant and widespread use of the internet. In 2019, 98.4% of individuals aged 16–24 years used the internet and less than 1% did not use the internet at all (Eurostat on internet use among 16–24-year-olds). At the same time, a significant percentage (94%) used the internet on a daily basis (Eurostat Daily use of the Internet).

The aim of this paper is to identify similarities and differences in the socio-economic and biological characteristics of students from Generation Z in France, Slovakia and Poland. The following hypothesis was formulated: the socio-economic and biological condition of Generation Z is independent of country of residence. In this study, SES was determined by the following indicators: monthly income (pocket money), work, self-assessed financial situation, having career plans for the next five years, time spent online and frequency of exercise. The analysis of biological factors was based on the following somatic indicators: body mass index (BMI), relative fat

mass (RFM), waist circumference (WC) and hand grip strength (HGS), as well as self-assessed health status. Although the students surveyed were representative of Generation Z, this study does not claim to offer conclusions about Generation Z as a whole, as the sample size is too small to reach such conclusions.

Material and methods

Our study did not require ethics clearance as confirmed by the Bioethics Committee of Uniwersytet Szczeciński (10 March 2025). The research material consisted of data collected from students ($n=157$) in three countries: France $n=36$ (17 male and 19 female), Slovakia $n=56$ (15 male and 41 female) and from Poland $n=65$ (26 male and 39 female) (Table 1). The mean calendar age of the respondents was 20.95 years ($\text{max}=25.23$; $\text{min}=17.24$; $\text{Me}=20.71$), with the mean age in France below 20 years. Convenience sampling was used (Teddlie and Yu 2007). Material was collected in 2019 and 2020 (prior to the COVID-19 pandemic). The French respondents were students at the Université Grenoble Alpes, the Slovak students at the Matej Bel University, Faculty of Economics, Banská Bystrica, and the Polish students at the University of Szczecin in Szczecin. All respondents were studying business-related programmes.

The material was collected through non-invasive anthropometric measurements taken by the authors and through a questionnaire completed by the students. We conducted a pilot study to pre-test the questionnaire structure and a survey to determine the amount of monthly disposable income available to students according to their subjective assessment by country.

Table 1. Key numerical characteristics of the study group

	Variant	Number	[%]	
Gender	M	58	36.94	
	F	99	63.06	
Country	France	36	22.93	
	Slovakia	56	35.67	
	Poland	65	41.40	
		all	M	F
Mean calendar age [years]	France	19.56	19.47	19.64
	Slovakia	21.33	21.97	21.10
	Poland	21.38	21.78	21.12

The research form was designed with a clear graphic layout. For each question, you had to mark your answer by putting an X in the appropriate box, choosing one of the available options. The questionnaire was developed in three language versions: Polish, English and French. The research form (questionnaire and anthropometry) was anonymous. All respondents gave verbal consent to participate in the study. Immediately after the interview, the date of the interview was recorded on each form, which was roughly checked for the completeness of the answers and anthropometric measurements. It is important to note the high level of interest among students in their body measurements and the health consequences of abnormal body weight in all three countries included in the study.

The following personal information was collected:

- date of birth – calendar age calculated in years and decimals,
- gender,
- country of residence.

Body measurements were taken according to the anthropometric technique (Martin 1958):

- body height (*B-v*) (*Basis-vertex*) [in cm], using an anthropometer, with 0.1 cm accuracy,

- body weight [in kg], with 100 g accuracy,
- waist circumference [in cm], using a metric tape, with 0.5 cm accuracy,
- dynamometry (hand grip strength, HGS) [in kg], readability 0.1 kg, capacity 80 kg, measured with KERN&Sohn GmbH dynamometer (version 1.0) and Grip Strength Ratings for Males and Females source: Camry Electronic Hand Dynamometer Instruction manual. Hand grip strength was measured three times in the dominant hand, with appropriate rest periods between trials. The highest recorded HGS value was used for analysis.

Body measurements were used to calculate somatic indices:

- Body Mass Index (BMI) $BMI = \text{body weight [in kg]} / [B-v]^2 \text{ [in m]}$ interpreted according to the WHO classification: underweight, normal weight, overweight, obese, morbidly obese. WHO standards for BMI (WHO 2023a).
- Waist Circumference (WC) $WC = \text{waist circumference} \leq \frac{1}{2} \text{ body height [in cm]}$ (Ashwell et al. 1996). Waist circumference should be less than half the person's height. Ratio of waist circumference to height is a strong predictor of intra-abdominal fat. In

this article, the authors use the abbreviation WC for this indicator, where normal WC is $\leq \frac{1}{2}$ of body height and abnormal WC is $> \frac{1}{2}$ of body height.

- Relative Fat Mass (RFM) index; for men $RFM = 64 - (20 \times \text{height/waist circumference})$, for women $RFM = 72 - (20 \times \text{height/waist circumference})$; normal RFM: $<25\%$ for men, $<35\%$ for women (Woolcott et al. 2018; Woolcott and Seuring 2022).

The questionnaire included questions on:

- The student's monthly disposable income: low (up to EUR 100 in France; up to EUR 50 in Slovakia; up to PLN 300 in Poland), medium (EUR 101–150 in France; EUR 51–100 Slovakia; PLN 301–500 in Poland), high (more than EUR 150 in France; more than EUR 100 in Slovakia; more than PLN 500 in Poland).
- Self-assessment of financial situation: very bad; bad; average; good; very good.
- Student's paid work: yes; no.
- Career plans for the next 5 years: Yes, I have; No, I have not; I do not know.
- How many hours a day the student spends online: 0 hours; 1–3 hours; 4–6 hours; 7 and more hours.
- How often does the student do sports during the week: Not at all; 1 time; 2–3 times per week; 4 times or more.
- Self-assessment of health status: very bad; bad; average; good; very good.

The data collected in this study were analysed using univariate and bivariate data analysis. In terms of univariate analysis, the classic measures of descriptive statistics were used: frequency distribution, arithmetic mean ($\bar{x}$), minimum (min), maximum (max), median (Me) and standard deviation (SD). To

determine the similarities and differences in the analysed characteristics of the respondents, the Mann-Whitney U test (Z) was used if there were only two variants (e.g. gender) and otherwise, the Kruskal-Wallis ANOVA by ranks (H) was used. In order to measure the strength and causality of the relationships between variables, we used the adjusted Pearson contingency coefficient (C). The relationships between variables were tested for significance using Pearson's χ^2 test of independence.

Results

Characteristics of Generation Z respondents

Respondents described their financial situation as good (46%) or average (40%). Almost 60% of the students surveyed were working. They reported a high level of monthly disposable income (67%) and had specific career plans for the next five years (62%). Respondents described their health as good (48%) or very good (25%) and said they exercised 2–3 times a week (45%). Almost half of those surveyed (48%) spent between four and six hours a day online.

The objective assessment of the respondents' health status, based on their somatic indicators, is generally consistent with their subjective assessment. Sixty percent of respondents had a normal BMI, 78% had a normal ratio of waist circumference to height (WC), 76% had a normal RFM, and over 41% had above average hand grip strength. Detailed information on the distribution of these biological characteristics by country and gender of respondents is presented in Tables 2 and 3.

Table 2. General biological characteristics of respondents

	Country	Gender	x	Me	Min	Max	SD
Body height [cm]	France	all	170.89	171.50	156.00	189.00	8.66
		M	178.26	178.00	169.00	189.00	4.72
		F	164.29	164.00	156.00	173.00	5.36
	Slovakia	all	171.53	169.50	153.00	203.00	10.06
		M	182.73	181.00	170.00	203.00	8.51
		F	167.43	167.00	153.00	183.00	7.03
	Poland	all	171.16	170.00	152.50	190.60	9.10
		M	179.32	178.60	164.50	190.60	6.72
		F	165.73	167.00	152.50	176.40	5.81
Body weight [kg]	France	all	65.23	63.5	46.90	92.60	12.91
		M	75.93	76.90	57.00	92.60	9.76
		F	55.66	55.50	46.90	64.60	5.90
	Slovakia	all	69.17	63.70	44.60	116.00	17.07
		M	84.10	83.00	63.70	116.00	16.63
		F	63.58	58.75	44.60	112.50	13.65
	Poland	all	75.84	75.80	44.90	178.70	19.85
		M	87.34	82.80	44.90	178.70	23.62
		F	68.17	68.40	48.80	96.10	12.07
Hand strength [kg]	France	all	34.93	34.25	20.30	55.70	10.24
		M	44.49	44.20	37.00	55.70	4.71
		F	26.37	25.90	20.30	38.20	4.54
	Slovakia	all	35.01	31.50	14.80	59.80	11.77
		M	51.01	51.60	32.00	59.80	7.78
		F	28.53	28.20	14.80	37.90	4.77
	Poland	all	37.72	34.40	20.40	62.70	11.58
		M	49.21	51.25	20.40	62.70	9.04
		F	30.05	28.20	23.50	38.60	4.63

Table 3. Self-assessment of health [by category]

	Country	Very bad	Bad	Average	Good	Very good
How would you describe your health status? [%]	France	0.00	2.78	16.67	33.33	47.22
	Slovakia	0.00	1.85	29.63	53.70	14.82
	Poland	1.54	1.54	26.15	50.77	20.00

Effect of country of residence on SES**Financial and working status**

Respondents from different countries differed statistically significantly in terms of their reported disposable income ($C=0.4854$, $p=7.0E-06$) and the associated self-assessment of financial situ-

ation ($C=0.3868$, $p=1.33E-02$). A high level of monthly income was reported by more than 47% of French respondents, 55% of Slovaks and 86% of Poles. At the same time, 57% of the French, 43% of the Slovak and 66% of the Polish respondents considered their financial situation to be at least good (Table 4).

Table 4. Monthly income and financial situation of respondents

	Country	Low	Medium	High		
What is your monthly disposable income? [%]	France	30.56	22.22	47.22		
	Slovakia	10.71	32.14	55.35		
	Poland	1.54	12.31	86.15		
		Very bad	Bad	Average	Good	Very good
How would you describe your financial situation? [%]	France	0.00	0.00	33.33	28.89	27.78
	Slovakia	1.79	1.79	53.57	39.29	3.56
	Poland	0.00	1.54	32.31	55.38	10.77

Respondents' country of residence had virtually no effect on their attitude to working while studying ($C=0.0182$, $p=0.9851$). Having a paid job was reported by 58% of students from France, 59% of students from Slovakia and 60% of students from Poland (Table 5). Students' country of residence had a greater, though still statistically insignificant, effect on their attitudes towards career planning for the next five years ($C=0.2480$, $p=0.1520$). More than 72% of the French students, half of the Slovak students and nearly 68% of the Polish

students reported that they had specific plans in this respect. Eight percent of the French, 21% of the Slovak and 11% of the Polish students had no career plans at all, while the rest said that they did not know what they wanted to do professionally in the near future (Table 6).

Table 5. Respondents with a paid job

	Country	Yes	No
Do you do paid work? [%]	France	58.33	41.67
	Slovakia	58.93	41.07
	Poland	60.00	40.00

Table 6. Respondents with career plans for the next 5 years

	Country	Yes, I have a plan	No, I have no plans	I do not what I want to do in the nearest future
Career plans for the next 5 years [%]	France	72.22	8.33	19.44
	Slovakia	50.00	21.43	28.57
	Poland	67.69	10.77	21.54

Sport and time spent online

Country of residence also significantly influenced the intensity of internet use. All respondents said that they spent at least one hour online during the day. In turn, four or more hours a day online were reported by 43% of the French, more than half of the Slovaks (55%) and almost three quarters of the Poles (72%) ($C=0.3512$, $p=7.1E-03$). On the other

hand, place of residence had no significant effect on the frequency of physical activity. The respondents were physically active. Exercising twice a week or more was reported by 67% of students from France, 57% from Slovakia and 54% from Poland ($C=0.2031$, $p=0.3444$) (Table 7). Nine per cent of Slovaks and 20% of both French and Polish students did not do any sport at all.

Table 7. Sport and time spent online

	Country	Never	Once	2–3 times per week	4 times or more
How often do you do sports during the week? [%]	France	19.44	13.89	52.78	13.89
	Slovakia	8.93	33.93	44.64	12.50
	Poland	20.00	26.15	41.54	12.31
	Country	0	1–3	4–6	7 and more
How many hours a day do you spend online? [%]	France	0.00	58.33	36.11	5.56
	Slovakia	0.00	44.64	50.00	5.36
	Poland	0.00	27.69	52.31	20.00

Effect of country of residence on biological characteristics

Body Mass Index

The place of residence of the respondents was significantly associated with BMI values ($C=0.4439$ $p=5.0E-03$). Normal BMI was found in 78% of the French, 61% of the Slovaks and 50% of the Poles (Table 8). At the same time, the mean BMI in each

country was higher for male students than for female students, and for both males and females, it was lowest for students from France and highest for students from Poland. Obesity and morbid obesity were found only among respondents from Slovakia and Poland, and were more common among males. On the other hand, BMI values indicating underweight were observed in women from Slovakia.

Table 8. BMI by country and gender of respondents

	Country	Gender	x	Me	Min	Max	SD
BMI	France	M	23.92	22.89	19.49	29.23	3.19
		F	20.60	20.01	18.52	24.09	1.70
	Slovakia	M	25.19	24.63	20.22	36.30	4.75
		F	22.69	21.69	17.08	41.83	4.86
	Poland	M	27.17	25.19	16.59	55.96	7.43
		F	24.78	24.14	18.59	33.85	3.97

Waist Circumference

The same, as above, is true for the relationship between the country of residence and the waist adiposity index. Overall, more than 78% of respondents had a healthy waist adiposity index, but there were significant differences in this value according to the respondents' coun-

try of residence ($C=0.2522$, $p=0.0494$). Among French students, 89% (and 100% of women) had a healthy WC, while among Slovaks it was just over 82% (88% of women). Polish students had the worst parameters in this respect, with just under 70% (74% of women) not having excessive abdominal fat (Table 9).

Table 9. WC by country and gender of respondents

	Country	Gender	Normal WC	Abnormal WC
WC [%]	France	M	76.47	23.53
		F	100.00	0.00
	Slovakia	M	66.67	33.34
		F	87.80	12.20
	Poland	M	61.54	38.46
		F	74.36	25.64

Relative Fat Mass

Country of residence of the respondents also had a statistically significant effect on changes in RFM ($H=6.17$, $p=0.0457$). With a mean of 27.3% for all students examined (22.03% for males and 30.45% for females), normal values were observed in

82.35% of French males, 66.67% of Slovak males and 65.38% of Polish males and 100% of French females, 80.49% of Slovak females and 69.23% of Polish females. Detailed information on RFM values in each country, by gender of the students examined, are shown in Table 10.

Table 10. Relative Fat Mass (RFM) index by country and gender

	Country	Gender	x	Me	Min	Max	SD
RFM [%]	France	all	24.92	26.39	12.22	33.94	6.24
		M	19.90	20.47	12.22	27.67	5.05
		F	29.41	29.04	25.03	33.94	2.83
	Slovakia	all	27.14	27.14	15.95	43.84	6.17
		M	22.10	20.10	15.95	31.34	5.31
		F	29.08	28.06	19.86	43.84	5.38
	Poland	all	28.75	28.32	14.15	42.63	6.51
		M	23.38	22.57	14.15	33.93	4.79
		F	32.32	32.05	24.06	42.63	4.85

Hand strength

In contrast to the above, the maximum hand strength values were not significantly

associated with the place of residence of the respondents ($H=3.2336$, $p=0.053$). In nominal terms, the highest mean

strength was found among the male students from Slovakia (51.01 ± 7.78 kg), followed by those from Poland (49.21 ± 9.04 kg), and the lowest among the male students from France (44.49 ± 4.71 kg). On the other hand, among the female students, the

strongest average grip was recorded by Polish students (30.05 ± 4.63 kg), followed by Slovak (28.53 ± 4.77 kg) and the French (26.37 ± 4.54 kg). Statistics for the maximum grip strength by country and gender are presented in Table 11.

Table 11. Hand Grip Strength (HGS) by country and gender

	Country	Gender	x	Me	Min	Max	SD
Max HGS [kg]	France	M	44.49	44.20	37.00	55.70	4.71
		F	26.37	25.90	20.30	38.20	4.54
	Slovakia	M	51.01	51.60	32.00	59.80	7.78
		F	28.53	28.20	14.80	37.90	4.77
	Poland	M	49.21	51.25	20.40	62.70	9.04
		F	30.05	28.20	23.50	38.60	4.63

Grip strength is an indicator of overall skeletal muscle strength. After all, hands are used in most daily physical activities. Dynamometry can be used as a complementary parameter in the diagnosis and prognosis of health, as well as in the course of recovery (Rantanen et al. 2003; Sasaki et al. 2007).

Self-assessment of health

In the analysis of self-assessed health status, there is no statistically significant relationship between the country of residence of the respondents and self-perceived health ($C=0.3487$, $p=0.0530$).

Irrespective of country of residence, men were more likely to rate their health as bad or very bad. This was the case for almost 5% of French male students and just over 1% of French female students, 7% of Slovak males and no Slovak females, more than 3% of Polish males and just under 2% of Polish females. At the same time, men were also more likely to rate their health as very good. Almost 22% of French males and 15% of French females, 35% of Slovak males and 26% of Slovak females and 31% of Polish males and 26% of Polish females made such a self-assessment (Table 12).

Table 12. Self-assessed health status by country and gender

	Country	Gender	Very bad	Bad	Average	Good	Very good
How would you describe your health status? [%]	France	M	2.44	2.44	21.95	51.22	21.95
		F	0.00	1.28	30.77	52.56	15.39
	Slovakia	M	2.33	4.65	18.60	39.53	34.89
		F	0.00	0.00	25.86	48.28	25.86
	Poland	M	0.00	3.13	28.12	37.50	31.25
		F	0.00	1.73	22.41	50.00	25.86

Summary of results

The results of our study suggest that the place of residence of Generation Z respondents has an impact on both their socio-economic and biological characteristics (Table 13). Even though the countries included in the study are all member states of the European Union, which is committed to reducing economic inequalities, and although the respondents represent the same 'occupation', income and the associated subjective assessment of financial situation is a differentiating factor. On the other hand, one would expect that growing up surrounded by new technologies in every aspect of life would result in similar and significant amounts of time spent online by Generation Z. However, French members of Generation Z spend significantly less time on these activities

than their Polish and Slovak counterparts. What members of Generation Z have in common is having career plans and working while studying, which could be attributed to the similar 'occupational' status of the respondents. In turn, the findings related to sports participation are interesting – this aspect of Generation Z's life appears to be universal. The majority of respondents in each country participate in sport, with the highest number in Slovakia, and in each country doing sport 2–3 times a week was the most common answer. This may explain the high self-assessment of health status regardless of the country. However, objective indicators such as BMI, RFM and WC appear to contradict the above. In this respect, French respondents have the best biological body parameters, while Generation Z students from Poland have the worst.

Table 13. Associations between SES and biological characteristics and country of residence

	Measure	Magnitude of relationship	<i>p-value</i>	Significant relationship*
SES	monthly income	C=0.4854	7.00E-06	yes
	time spent online	C=0.3512	7.08E-03	yes
	self-assessment of financial situation	C=0.3868	1.33E-02	yes
	career plans	C=0.2480	1.52E-01	no
	sport	C=0.2414	3.44E-01	no
	work	C=0.0182	9.85E-01	no
Biological indicators	BMI	C=0.4493	5.00E-03	yes
	RFM	H=6.1700	4.57E-02	yes
	WC	C=0.2522	4.94E-02	yes
	self-assessment of health	C=0.3487	5.30E-02	no
	hand strength	H=3.6899	1.58E-0.1	no

*p-value≤0.05

Discussion

The relationship between SES and human biological characteristics is the subject of

much research and scientific interest in economics, human biology, sociology and other disciplines concerned with the environmental determinants of human life.

The components of SES are selected according to the objectives of the particular study, its scope and the availability of data. The cultural differences of the environment being studied must also be taken into account. But whatever the cultural factors, Generation Z, 'immersed' in new technologies, may end up paying a very high price for being constantly connected. A sedentary lifestyle promotes excessive body weight, leading to overweight and obesity, which are associated with premature mortality, cardiovascular disease, hypertension, degenerative joint disease, certain cancers, diabetes, among others. (WHO 2023b). More than one billion people worldwide are obese – 650 million adults, 340 million adolescents and 39 million children. This number continues to grow. The WHO estimates that by 2025, approximately 167 million people – adults and children – will become less healthy because they are overweight or obese (WHO 2022).

The lifestyles of today are very different from those of just 20 years ago. People living today still remember a world without constant access to the internet, the telephone and the many sources of information that are now commonplace and almost indispensable. Generation Z, on the other hand, has never known a life without internet technology. This characteristic is universal, just as new technologies are universal and global. The presence of technology in every aspect of life, together with the time spent online, influences lifestyles and, consequently, well-being. This suggests that members of Generation Z will share many common characteristics, regardless of where they live. Arseni et al. (2020) studied students and found a moderate relationship between BMI and the number of hours spent on smartphones over the weekend.

The authors found that smartphone use, irrespective of purpose, led to reduced engagement in physical activity. This phenomenon is concerning, due to the increasing amounts of time spent online.

Meanwhile, the Generation Z respondents differ both in terms of SES and the biological characteristics of their bodies. In the first place, they differ in terms of their economic situation, both monthly disposable income and subjective assessment of financial situation, which could be attributed to the different level of economic development in each country. In turn, one would expect them to spend similar amounts of time online. However, it turned out that the Polish students spent the most time online, followed by the Slovaks, with the French spending the least time online. Time spent online may influence adiposity rates in Generation Z representatives from different countries, despite similar levels of physical activity. We found that adiposity rates of Generation Z, as measured by BMI, RFM as well as WC, also vary from country to country. In fact, the best results in this regard were observed among the students from France, followed by those from Slovakia, with Polish students coming in last. This suggests that there is a direct correlation between the amount of time spent online and the biological body characteristics of Generation Z. A more in-depth exploration of this correlation will be the subject of future research.

Socio-economic status is strongly influenced by the living environment. Therefore, in order to minimise the number of confounding factors influencing the variables of SES, the study focused on students, i.e. people in a similar life situation and at the same stage of life, living in the EU. It was assumed that

they would also share the same lifestyle associated with new technologies, which they use as a source of both knowledge and entertainment.

The socioeconomic status of a family affects the upbringing of the children growing up in it. According to Hemmerts et al. (2017), early involvement of parents and carers in reading with their child speeds up the reading process and helps them to be more successful at school. Attitudes to education, sport, health, the environment and much more are formed from an early age. Parental involvement in the child's overall education is strongly associated with parental education and the SES of the family environment. In our study, the French students had the lowest rates of overweight and obesity, which may be related to higher SES and greater parental awareness in the French academic community under study. Similar observations have been made by other researchers regarding the effect of parental education and family SES on children's success. Azhar et al. (2014) showed a correlation of student success with parental education and family SES. Parental education increases the chances of educational success for the children. In our study, we did not examine the education of the parents of the students analysed, but self-assessment of financial situation is related to family SES and indirectly to parental education. In addition, the fact that the student is earning extra money (student's paid work) is an indication of the student's determination and resourcefulness.

Interesting research was done by Sainz et al. (2021), who found that lower socio-economic status positively correlated with more meta-dehumanisation and poorer well-being. Brown et al. (2005) in their study set out to answer

the question of whether individual socio-economic status (as determined by income from work) and community-level SES predicted the onset of stroke (taking into account patients' lifestyle and health status). Using logistic regression, they were able to confirm that both individual and community socio-economic status can predict the onset of stroke. They found that average household income was the most powerful community-level measure of socio-economic status for predicting stroke. The onset of stroke was significantly predicted by individual income and average household income both independently and after taking into account individual behavioural and medical risk factors. The study found that individual income was a significant predictor of smoking and obesity, while community socioeconomic status was significantly associated with heart disease, alcohol and tobacco use, diabetes and obesity (Brown et al. 2005).

The association between SES and hypertension was analysed by Colhoun et al. (1998) based on the available literature from 1966–1996. Mortality rates from hypertension-related disorders, including coronary heart disease, hypertensive heart disease, stroke and kidney failure, showed an inverse relationship with SES. Lower SES was associated with higher mean blood pressure in almost all studies conducted in developed countries. This phenomenon was observed more frequently in women. In contrast, in undeveloped or developing countries, a direct relationship between SES and blood pressure was often found, potentially due to higher rates of obesity and higher consumption of salt and alcohol among those with higher SES. Understanding and preventing SES differences in obesity, which are particularly marked

in women, is a major challenge in reducing the impact of SES on hypertension.

Bapat et al. (2017) studied physical activity, screen time and academic work in the context of socio-economic status and sleep duration in school-aged children in India. The authors found that children of the highest socio-economic status slept nearly an hour and a half less than those of the lowest socio-economic status. Children of lower SES were more physically active and had more screen time, and children of higher SES spent more time studying. While screen time was inversely related with sleep duration, the biggest influence on the relationship between socio-economic status and sleep duration was academic work. Physical activity did not play a significant role. In India, there is a strong inverse relationship between academic work and sleep duration in children and adolescents (Bapat et al. 2017).

Huikari et al. (2021) studied Finns (6,169 men and 5,889 women) and found that people with higher socio-economic status were more likely to be physically active in their leisure time. This was true whether SES was defined by income level, education or occupation. After dividing the population studied (mean age 46, unfortunately not Generation Z) into different socio-economic groups, based on education, income and occupation, the authors found that income was not significantly associated with physically active leisure time in any of the SES groups. The study demonstrated an inverse relationship between leisure-time physical activity and time spent in front of a screen (TV or computer) and other aspects of an unhealthy lifestyle, and a positive relationship with self-perceived health (Huikari et al. 2021).

Time spent online and the availability of a wide range of information on the

internet has created a misconception among Generation Z that everything they need for real life can be found online. Unfortunately, the web cannot replace human interaction; it severely limits physical activity and emotional communication in family, school and work life. It is currently difficult to predict the consequences for health (physical and mental) of 'immersion' in new technologies.

Conclusions

Generation Z has been brought up in a world of ubiquitous internet access, which has had a role in shaping the traits and values they have in common. They see the world very differently from those who came before them. Representatives of Generation Z are forward-looking, while remaining conservative in many aspects. Generation Z is both fashionable and timeless. As members of Generation Z have already entered or are about to enter the labour market, it is important that national social policies to include health promotion programmes aimed at the physical and mental wellbeing of young people. It is interesting to note that young people in Generation Z want to stand out from the crowd, through clothing styles, unusual passions, invasive body decoration. Generation Z strives for authenticity by fulfilling their needs, taking care of themselves and expressing themselves boldly, often shocking older generations.

Country of residence is partly responsible for differences in the SES and biological characteristics of people in Generation Z. On the other hand, irrespective of where they live, Generation Z have similar specific career plans, work at similar rates while studying, rate their health, similarly, engage in physical ac-

tivity with similar frequency and have similar hand grip strength.

It is most likely that the lack of a clear relationship between country of residence and the variables analysed in this study can be attributed to environmental differences. The living environment has an impact on economic and social situation as well as on body shape. For Generation Z, new technologies are a key element shaping the living environment. It can be concluded that natural factors (ambient fauna and flora) continue to explain socio-economic and health status. Nevertheless, research findings show that the amount of time spent online influences eco-sensitive traits, especially body adiposity, in the young adults in this study. This aspect is something the authors plan to address in future analyses. Due to the small sample size, it is not possible to draw conclusions about Generation Z as a whole. We plan to explore this topic in more depth and with a larger group of respondents.

The strength of the study is that it presents an original look at SES combined with biological characteristics of Generation Z. It is also interesting to note that the statistical analyses combine anthropometric characteristics, referred to in the paper as biological factors, with socio-economic factors in an international context. The limitations of the study include covering only a certain fraction of Generation Z, namely students of economics. The different ranges of birth years used for Generation Z also make it difficult to compare research results. The sample size is too small to be representative of Generation Z as a whole.

Key concluding points:

1. The place of residence of Generation Z respondents has an impact on both their socio-economic and biological characteristics.
2. Socio-economic status was determined by the following indicators: monthly income (pocket money), work, self-assessed financial situation, having career plans for the next five years, time spent online and frequency of exercise.
3. Generation Z respondents differ both in terms of SES and the biological characteristics of their bodies.
4. Time spent online may influence adiposity rates in Generation Z representatives from different countries, despite similar levels of physical activity.
5. It is predicted that, in the near future, higher paid jobs will involve the use of new technologies and that using them will become a downright necessity.

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Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this paper.

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Author contributions

EF: Methodology, Software, Validation, Investigation, Data collection, Data curation, Writing Original Draft, Review & Editing, Visualization, Supervision, Project administration, Bibliography search; ER-M: Methodology, Investigation, Data collection, Resources, Writing Original

Draft, Review & Editing, Funding acquisition, Bibliography search, Corresponding author; RC: Methodology, Software, Validation, Formal analysis, Investigation, Data curation, Writing Original Draft, Visualization; GP: Data collection; JM: Data collection

Corresponding author

Ewa Rębacz-Marón, Department of Ecology and Anthropology, Institute of Biology, University of Szczecin, ul. Wąska 13, 71-415 Szczecin, Poland, e-mail: ewa.rebacz-marón@usz.edu.pl

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