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SOMATIC STRUCTURE OF THE FEMALE STUDENTS AT THE UNIVERSITY OF RZESZÓW

Abstract

For many years, students of various backgrounds have been subject to research, including the anthropological studies. The second half of the 20th century underwent a change in the anthropological view on the somatic race selection of pupils from various types of schools and faculties. The major aim of this work is to present the typological diversity of female students in the science faculties at the University of Rzeszów in the face of Kretschmer. There were the following specific aims: research in the influence of the social environment on the somatic structure of the female students, specification of the influence of the body structure and the social environment on the menarche of the surveyed students and the comparison of the results to the results of the authors in other academic centers in Poland. 2009/2010, 143 randomly chosen students of the Biological and Agricultural Studies at the University of Rzeszów were researched. Only full-time course students were subject to the research. The standing position concerned the following measurements: body height (B-y), shoulders girth n(a-a), coxal girth (ic-ic), chest girth (at xi) and bodyweight. For each of the feature, the following parameters were taken: arithmetic mean (\bar{X}) standard deviation (Sd), variance (Sx), variation coefficient (V), minimum and maximum values. Based

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on those values, the body features of the students of various social origins and university specializations were compared. The evaluation of the statistical significance of the differences in the results of the students and the age of menarche of the students from cities compared to villages was conducted using t-Student test ($p < 0,05$). The somatometrical results showed the following indicators: Rohrer indicator, growth and shoulder indicator, chest girth indicator, BMI indicator also-called "Kretschmer's indicator". On the basis of the above-mentioned indicators (excluding the BMI indicator), according to Kretschmer's typology, the following female students' body structures were specified. The survey data provided social and environmental birth order and the age of students' menarche (the retrospective method): 1) The vast majority of the students of the science faculties of the University of Rzeszów have the leptosomic body structure; 2) Students living in the village usually have wider shoulders and wider chest girths than the students living in cities. Students living in villages are also heavier; 3) Sthenic-built women mature earlier, while women who have leptosomic body structure mature later; 4) Women students of the University of Rzeszów do not differ from other female students in Poland; 5) No relation between the place of living and the age of menarche was observed; 6) The students of the University of Rzeszów surveyed in 2009/2010 had heavier body structures than the students of 1999/2000.

Keywords: young people, body structures, Kretschmer's typology, age of menarche

Introduction

A constitution or, in other words, a human biotype includes genetically determined biological and psychological personal features. The features are modified during the ontogenesis by particular exterior environment factors (Malinowski 1999). A woman is not born constituted as she has tendencies to develop (Chazewski 1999). Undoubtedly, some features are more susceptible to their exterior environment. The features that are genetically strongly determined are: height and general body size, structure ratio specified by the skeleton development. On the other hand, bodyweight and the condition of soft tissues (e.g. the level of muscle and fat tissue development) are strongly influenced by environmental fac-

tors related to the lifestyle, nourishment, physical activity and job (Malinowski 1999). The synergy between genetic (endogenic) and environmental (exogenic) factors leads to the variety of forms dependent on their mutual connections. Therefore, a genetically slim person who nourishes appropriately may have a heavier body structure than a person who is determined to have the heavy body structure, and who maintains a strict diet or is e.g. undernourished (Wolański et al. 1975).

For many years, students of various origins have been anthropologically researched. The foundation of the first Polish Physical Educational Studies at the University of Poznań in 1919 and the establishment of the Central Physical Education Institute in Warszawa, as well as the foundation of new Anthropology Centers around Poland were essential for the development of such research in Poland. The foundation of the Physical Education Studies in 1951 had also a significant impact on the research diversity among students. That resulted in launching regular research on the biological condition of young people (Burdziński 1976). The issue of the body structure of the young people who are physically active compared to the people who do not do sports was explored by numerous researchers, e.g. the ground-breaking works of Mydlarski. That subject matter is still the focal point of numerous researchers. Views on that issue are still unsettled as some researchers claim that intensive physical exercises cause significant and express changes in the body structure and they can even modify the constitutional type of the human body. However, others believe that the genetically somatic type does not undergo changes or it may be subject only to some modifications (Malinowski & Stolarczyk 1992). The first analysis of the somatic diversity of students were presented by Jaxa-Bykowski, Sobolski, Wokroj, Stojanowski and Grossner (Asienkiewicz et al. 2001). The research conducted at the University of Poznań between 1927 and 1931 by Stojanowski concerned the relation between the race and the constitutional physical fitness. At the beginning, most of the works considered only two somatic features, which were considered to be essential at that time. Those were height and weight (Burdziński 1976). After WWII, following the initiative of Mydlarski, Górny, Wolański and Milicer, morphological research on young people was launched again. The research concerned the differences in education, places of living and the occupations of the respondents' parents. The research on somatic features was conducted mainly among physical education university students, thus, most of the information refers to them (Czarny 2007). The second half of the 20th century brought a change in the extent

of anthropological observations within race selection and on somatic selection of young people in different schools and faculties. The results of Milicer's and, subsequent Drozdowski's studies showed the essence of the somatic selection and the changes that appeared during studies. The research mainly concerned students of physical studies. Despite the research, there is no general view on the morphological diversity of male and female students with regard to their somatic body structure or their faculties (Asienkiewicz et al. 2001). Also the relation between the somatic structure and the economic and the social factors were examined. The research was conducted by such people as Tatarczuk and Asienkiewicz, and the results of their studies, compared to other works, are ambivalent. Middle value changes of the somatic features were notified. Also some secular trends of those features, as well as changes in the typological composition of the young people were identified in the following years.

The major aim of the thesis is to describe the typological diversity of the female students at the University of Rzeszów within the meaning of Kretschmer's typology. Nevertheless, there were the following specific aims: to examine the influence of the body structure and the place of living on the age of menarche among the female students that were examined. The author also compared them to the research results of other researchers in the academic centers in Poland.

Subject Matter and Method

In the academic year of 2009/2010, 143 female students of science faculties at the Biological and Agricultural Studies of the University of Rzeszów were randomly selected for anthropometrical measurements. Only full-time students were qualified for the tests. The standing position concerned the following measurements: body height (B-y), arm girth n(a-a), coxal girth (ic-ic), chest girth (at xi) and body weight. For each of the feature, the following parameters were taken: arithmetic mean (\bar{X}) standard deviation (Sd), variance (Sx), coefficient variation (V), minimum and maximum values (Błażejowski et al. 2009/10; Łomnicki 2007). Based on those values, the body features of students from various social origins and university specializations were compared.

The statistical evaluation of the differences in the values of the researched features and the differences in the menarche age of the students from the village against the students living in the city was conducted based on t-Student

($p < 0.05$) test (Błażejowski et al. 2009/2010; Łomnicki 2007). The somatometrical results showed the following indicators: Rohrer indicator, growth and shoulder indicator, chest girth indicator, BMI indicator and so-called “Kretschmer’s indicator”. On the basis of the above-mentioned indicators (excluding BMI indicator), based on Kretschmer typology, the following female student body structures were specified (Malinowski & Bożiłow 1997; Burdukiewicz & Pietraszewska 2003; Drozdowski 1998). On the basis of the above-mentioned (except for the BMI indicator) the body structure types of the students were specified according to Kretschmer’s typology. Numerous patterns and key numbers were developed for Kretschmer’s typology, which led to its objectification and to the extension of the comparability of the results. The simplest method to specify typological specifications was created by Curtius who suggested the use of Rohrer’s indicator which reduces the ratio between bodyweight in grams and the growth measured in centimeters in cube (Table 1) (Malinowski & Strzałko 1985). Stęślicka developed a separate key for typological specifications according to Kretschmer’s system based on the following 4 indicators: Rohrer’s indicator, shoulders and growth indicator, chest girth indicator (Table 2) (Drozdowski 1998). When all the indicators showed the same body structure, clear types were identified. On the other hand, when at least one of the indicators showed another type than the rest, then mixed types (with two or more components) were identified. Based on a survey, information on the social and living aspects, as well as the birth order and the menarche age of the students (the retrospective method) were gathered.

Table 1. Key to typological terms according to Curtius formula

Type	Rohrer’s indicator
leptosomic	$x-1.28$
athletic	1.28–1.49
sthenic	1.47– x

Table 2. Key to typological terms according to Stęślicka

Body structure	Rohrer’s indicator	Shoulder and growth indicator	Chest girth indicator	Hips and growth indicator
leptosomic	$x-1.35$	$x-22.5$	$x-51.0$	$x-17.0$
athletic	1.36–1.55	22.6– x	51.1–56.0	16.5–18.0
sthenic	1.56– x	21.5–23.5	54.5– x	17.1– x

Most of the students (60.84%) came from the village, while only 39.16% from the city. Most of the researched mothers had completed (51.75%) secondary education, while most of the fathers had finished vocational schools (53.85%). The type of the parents' occupation did not always correspond with their education. The fathers, as well as the mothers of the students were usually working physically (mothers 53.15%, fathers 77.62%). The researched group expressly showed the tendency of families with 2 (40.56%) or 3 children (30.08%). Students born as the first children were in the majority (46.15%). The vast majority of the respondents completed comprehensive secondary schools (86.71%). Most of the students (65.73%) specified their living conditions as "good", while neither of them evaluated them as "bad". As much as 80.42% students represented that they were doing sports. Usually that was low physical activity (57.34%) and only 5% of the students were performing sports very actively.

Results

The anthropometrical measurements included 5 somatic features which constituted a ground for the specification the components the body structure.

The average value of the height of the respondents was 163.16 cm, their average bodyweight amounted to 57.33 kg and the average chest girth was 79.61 cm. The high values of standard deviation and the variation coefficient of those features indicated that there was big diversification of those three parameters among the respondents. Relating to the other two features (shoulder width and coxal width), their average values amounted to 34.38 cm and 26.56 cm (Table 3).

Table 3. Statistical characteristics of height (cm), bodyweight (kg), chest girth (cm) shoulders and hips width (cm) of the students of the University of Rzeszów

Anthropometric feature	\bar{X}	Sd	Sx	V	min.	max.
B-v	163.13	5.71	0.48	3	150.00	178.50
a-a	34.38	1.89	0.15	5	28.10	40.10
ic-ic	26.56	1.55	0.13	1	23.10	35.00
Chest girth	79.61	5.66	0.47	5	68.50	114.00
Bodyweight	57.33	9.25	0.78	16	39.20	116.20

Virtually, the students from villages were not different from the students from cities with regard to their height and coxal width. Moreover, the students from the village had wider shoulders (approximately 0.83 cm) and that difference was statistically significant. They also had larger average chest circles (approximately 2.52 cm), however, the difference was not statistically considerable. They were heavier than the students (approximately 2.75 kg) from the city (Table 4, 5; Fig. 1, 2).

Table 4. Statistical characteristics of height (cm), bodyweight (kg), chest girth (cm) shoulders and hips width (cm) of the students from villages

Anthropometric feature	\bar{X}	Sd	Sx	V	min.	max.
B-v	163.14	5.53	0.59	3	150.00	175.00
a-a	34.67	1.80	0.19	5	28.10	40.10
ic-ic	26.68	1.70	0.18	6	23.10	35.00
Chest girth	81.12	10.97	1.18	1	68.50	164.10
Bodyweight	58.37	9.83	1.05	16	44.00	116.20

Table 5. Statistical characteristics of height (cm), bodyweight (kg), chest girth (cm) shoulders and hips width (cm) of the students from cities

Anthropometric feature	\bar{X}	Sd	Sx	V	min.	max.
B-v	163.14	5.99	0.80	4	151.50	178.50
a-a	33.84	1.95	0.26	6	28.10	39.00
ic-ic	26.41	1.28	0.17	5	24.10	29.10
Chest girth	78.60	4.27	0.57	5	70.00	90.00
Bodyweight	55.62	8.01	1.07	14	39.20	82.90

Each of the students was analyzed in the respect of her body structure. Among the respondents the leptosomic body structure was prevalent (53.85%). That was the only clear type identified using Stęślicka's method. The rest included were mixed types and the most prevalent was the leptosomic-athletic (30.77%). On the other hand, the smallest group consisted of students of the athletic-sthenic body structure (3.5%) (Fig. 3).

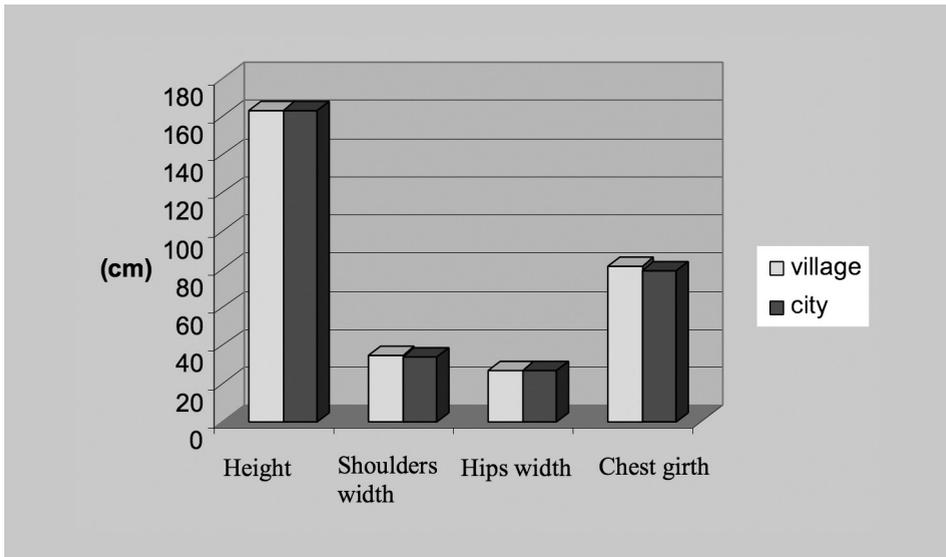


Fig. 1. Comparison between average values of height (cm), shoulders and hips width (cm) and the average chest girth (cm) of the students from villages and cities

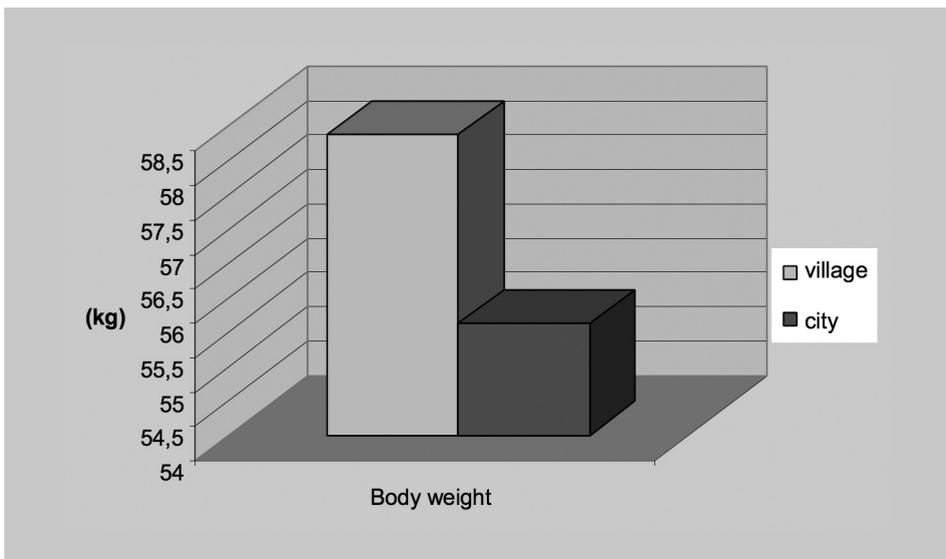


Fig. 2. Comparison of the average bodyweight (kg) of students from villages and cities

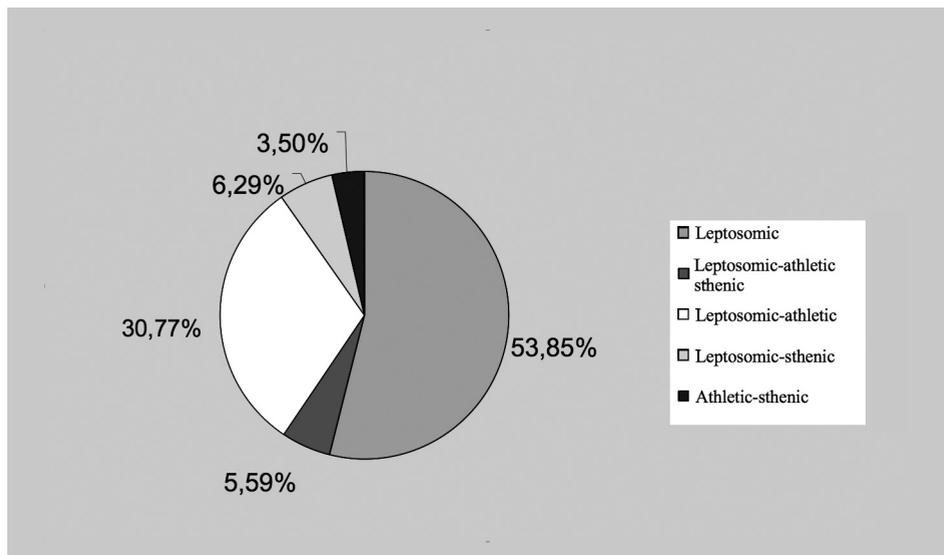


Fig. 3. Female students' body structure types according to the formula by Stęślicka

The students living in villages, as well as the students living in cities tended to have the leptosomic type of the body structure. The smallest amount of the respondents had the sthenic type of their body structure. In the village, more students had the sthenic type of body structure (approximately 8%), while less of them (approximately 11%) had the leptosomic body structure compared to the respondents from the city. The proportion of athletic-built students was slightly different in those two groups: in the village, it amounted to 33.33%, while in the city the percentage was 30.91% (Fig. 4, 5).

Generally, the proportion of each somatic type specified using Curtius' method, did not significantly differ from the results obtained by Kretschmer indicator. Namely, the order of each somatic type, starting from the most numerous one, was the same: LAP. However, Kretschmer's indicator provides an interesting comparison between the people from the village and from the city. It shows that there were more students of the leptosomic body structure in cities, while the athletic type was more prevalent in cities compared to villages. Therefore, the results were reverse to the those measured using Curtius' method. Nevertheless, as for the sthenic type, its proportion specified on the basis of Kretschmer indicator was virtually equal in the village and in the city (Fig. 6, 7).

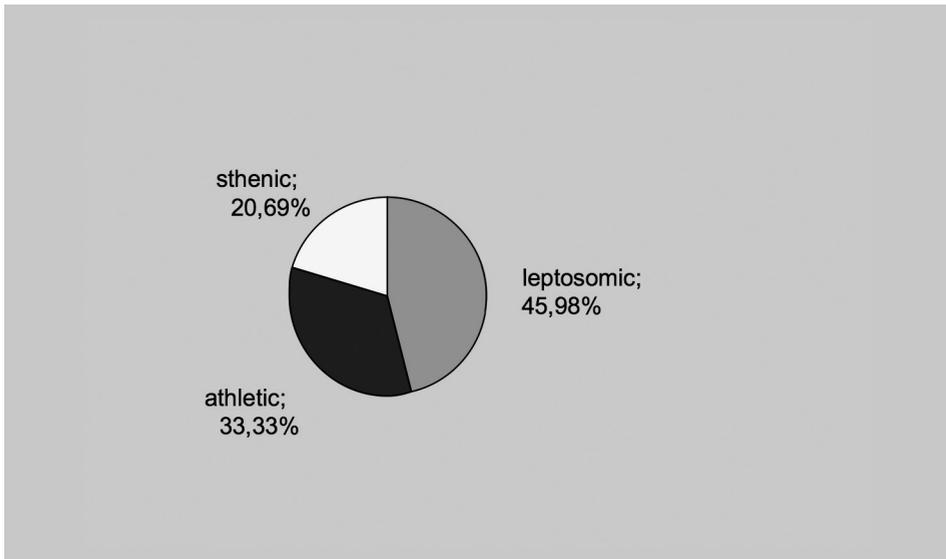


Fig. 4. Types of body structure students from villages according to the formula by Curtius

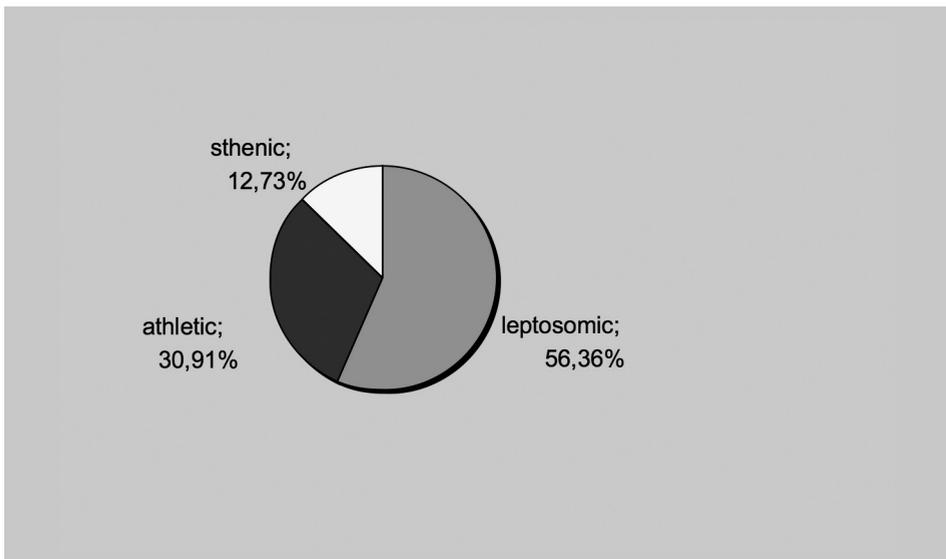


Fig. 5. Types of body structures of the students from cities according to the formula by Curtius

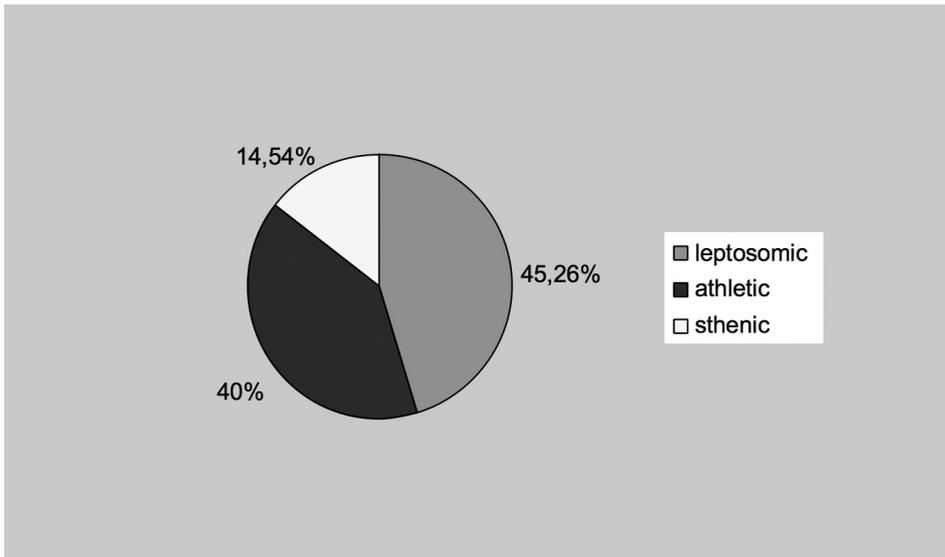


Fig. 6. Types of body structures of the students from cities according to Kretschmer's indicator

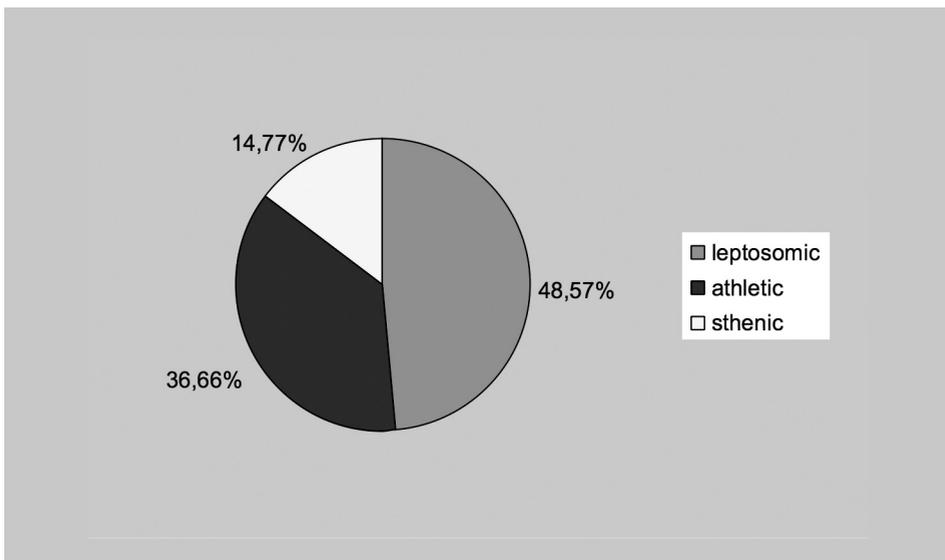


Fig. 7. Types of body structures of the students from cities according to Kretschmer's indicator

The most common method of evaluating the maturing pace of girls is the menarche age. The respondents usually matured at the age of 13.62. There was no evidence that the place of living had an influence on the menarche age (the average margin is 0.07 for the benefit of the city and it was insignificant, $p = 0.352$). Either in villages or in cities, most of the respondents matured at the age of 13 in the village. The second in turn was 14 compared to 12 in the city. Only little part of the students matured over the age of 15 or under the age of 12 (Fig. 8).

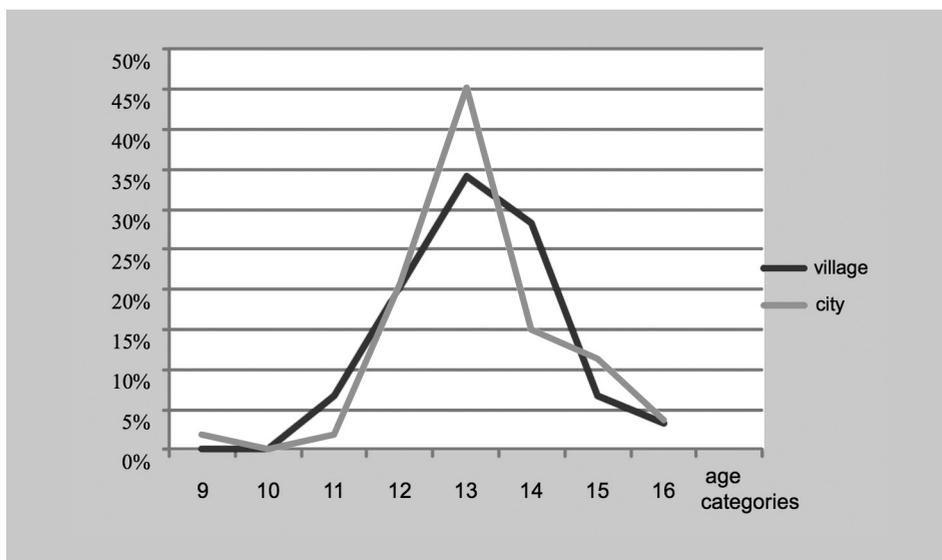


Fig. 8. Comparison of the age of menarche in various age categories dependent on the pace of living

The girls of the leptosomic body structure matured much later, approximately at the age of 13 years and 8 months. The athletic-built students matured relatively earlier (approximately 13 years and 5 months), while the students of the sthenic type of the body structure matured at the earliest, approximately at the age of 13 years and 1 month. Therefore, the variation between those two entirely different types of the body structure was considerable and it amounted to 7 months (Table 6).

Table 6. Average age of menarche of the representatives of various somatic types

Age of menarche	Leptosomic type N=71	Athletic type N=47	Sthenic type N=25
\bar{X}	13.84 (13 years and 8 months)	13.55 (13 years and 5 months)	13.16 (13 years and 1 month)
min.	11.00	11.00	9.60
max.	16.90	16.60	15.70
Sd	1.22	1.17	1.26

Discussion and conclusions

The somatic structure of the students in Rzeszów has been measured since the 1960's of the 20th century. During the following years, the average height increased (from 160.20 in 1968 to 165.92 in 2003), whereas the average body-weight oscillated only slightly (± 3 kg) (Czarny 2007). In the academic year of 1999/2000, at the Pedagogical University in Rzeszów, Asienkiewicz and Tatarczuk conducted research (Tatarczuk & Asienkiewicz 2009). According to it, the average height of the female students was 163.03, while their average bodyweight was 54.13 kg. The author's own research conducted in 2010 provided identical results concerning height. Currently, female students have slightly narrower hips than those of 1999/2000, whereas their shoulders' width is insignificantly different. During the recent 10 years, the typological composition of the students in Rzeszów also have undergone some changes. Firstly, the proportion of the sthenic type increased (from 8.4% to 17.5%), while the number of the women with the athletic body structure decreased (from 43.2% to 32.9%). In consequence, after 10 years, the massiveness of the students at the University of Rzeszów increased, which is proved by higher average Rohrer's and BMI values. However, that is not caused by the build-up of muscles but the increase of the fat tissue (meanwhile, the percentage of athletic-built students decreased).

The literature of the subject underlines the increasing leptosomization of the body structure of the students (Tatarczuk & Asienkiewicz 2009; Szymański

1998). Some researchers may have turned to a reverse viewpoint. While examining the typological diversity of the Pedagogical University in Zielona Góra, based on the method of Heath and Carter, Asienkiewicz observed that the body structure of the students in Zielona Góra could be identified as endo-mesomorphic with an increased level of fat and low muscle development. On Sheldon's somatogram, on the other hand, the female body structure corresponds with the endomorphic characteristics. He claimed that the fact results from low physical activity (Asienkiewicz 2003). While following the changes in the height and the weight of the students at the above-mentioned university. Asienkiewicz and Tatarczuk observed an increase of Rohrer's indicator starting from the middle 1990's until 2007 (Asienkiewicz & Tatarczuk 2007). Further observations and measurements shall provide the answer to the question whether heavier body structure of students at universities is only a temporary fluctuation or the beginning of a permanent tendency.

Comparing the own research of the female students at the University of Rzeszów and the Pedagogical University in Zielona Góra it appears that the students from the Pedagogical University in Zielona Góra are approximately higher and heavier, they have wider shoulders and significantly wider hips. However, they have slimmer body structures, which is proved by lower values of Rohrer's and BMI indicators. The typological compositions of those two groups differ from each other. The students of the Pedagogical University tend to have the athletic body structure, while the students of the University of Rzeszów usually have the leptosomic body structure. The sthenic body structure is more prevalent in Rzeszów (Asienkiewicz 2002). Compared to the female students of the Technical and Agricultural University in Bydgoszcz on the average, the female students of the University of Rzeszów tested in 2010 are higher, while their bodyweight differs insignificantly (Bratkowska-Gołaszewska 2000). Szymański specified the proportion of Kretschmer somatic types among the female students at the Pedagogical University in Bydgoszcz. In comparison with the students I researched, there are more students of the sthenic body structure. Also the athletic type is more prevalent (Szymański 1998). The women that study in Rzeszów have much wider shoulders and hips than the students from the Medical University in Wrocław, while their average bodyweight and height does not differ. While comparing the above-mentioned data, it is important that the research of the students of each university was conducted within the period of over 10 years, therefore, the secular trend played an important role in that case (Gworys 1978).

With regard to its profiles, each university has specific and different requirements. The selection processes are the strictest among the students of the academy of physical education. The students of that faculty attend intensive and highly exhausting courses which include physical exercises and many hours of individual physical improvement. That is an important factor which strictly selects hardy persons and influences the silhouettes of the students (Malinowski & Stolarczyk 1992). The research of numerous academics confirms that observation. The students of the physical faculty are distinguishable in comparison to the students of the pedagogical faculties, i.e. on the average, they are taller and heavier, they have wider shoulders and hips. They also have slimmer body structures. Among the students of the University of Physical Education, there were many more cases of the leptosomic and less students of the sthenic body structure (Asienkiewicz et al. 2001). Kałmuczak and Pietrusik obtained similar results. They specified the quantitative characteristics of the somatic types at the University of Physical Education in Poznań. The results of the research conducted by the students of biological sciences provide similar findings compared to the measurements of the physical education students (Kałmuczak & Pietrusik 2000). Barancewicz, Niemiec and Niżankowski conducted an analysis of the somatic structure of the students at the Medical Academy in Wrocław. While comparing the morphological results of the women on the Medical Studies and Pharmaceutical Studies, the only considerable difference relates to the chest girth for the benefit of the former faculty (Barancewicz et al. 1969). The article of Plat also referred to the relation between the biotype of the students from the University of Szczecin and the specialization they chose. By analyzing the material, the author came to the conclusion that there are no considerable morphological differences between the students who have predispositions for various subjects, e.g. sciences or descriptive faculties. The students of the sciences at the University of Szczecin and the University of Rzeszów obtain almost identical average values of body-weight and height (Plat 1998). That is the result of the fact that only the students of physical education differentiate from other students, therefore, in various research they should be treated as a separate group. Otherwise, the results of such research will not reflect the reality and may lead to misleading findings (e.g. the students of the University of Physical Education lower the values of Rohrer's indicator).

The representatives of social anthropology are focused on the influence of the social environment on the increase and the pace of children's and young

people's development at various levels of ontogenesis. In their viewpoint, social variables influence the process of shaping the phenotypic features of a person independently and with various intensity. However, the influence is indirect and its differentiating impact is inflicted via such factors as diet, physical activity, psycho-neural conditions and diseases. One of such variables is the place of living. The state of the somatic development of the students in Rzeszów was examined by Asienkiewicz (Asienkiewicz 2000). The author claims that, with comparison to the students from the village, the students who live in the city are usually shorter and less heavy, they have narrower hips, however, there is no difference in their average shoulder width. As a result, the place of living plays a significant role.

After 10 years, the situation changed, which was proved by the results of own research. It turns out that the living conditions are not a factor significantly differentiating both of the groups anymore and the values of some of the somatic features are in favor of the students from the village. However, it should be noted that the research is based on a small survey group, therefore, it only indicates the occurrence of some phenomena which should be verified by research on a larger scale (such research are currently conducted by the author of this work) although most of the works quoted in the discussion are based on similar samples of similar numbers. The relation between a village and a small town makes the environmental development differences blur, which suggests that there is the possibility of reducing distances of urban stratification which were present in the past (Mleczo 2004). The results of my research appear to confirm that thesis in view of the fact that the majority of the urban students that I have surveyed come from small towns. In fact, plenty of the research conducted in the 1980's and the 1990's indicated the existence of significant differences in the somatic structure of young people who come from various places of living (Jopkiewicz et al. 2002; Stolarczyk et al. 2000). Łaska-Mierzejewska came to the conclusion that the inhabitants of Warszawa and other big cities mature earlier, while girls from villages mature at the latest (Łaska-Mierzejewska & Łuczak 1993). The observation of Rogowska conducted at the turn of the 80's and the 90's confirmed the rule (Rogowska 2004). Nevertheless, my thesis, as well as other works (Tatarczuk et al. 2007; Mleczo 2004) indicate that the place of living does not significantly differentiate the age of menarche. However, the age of menarche is highly dependent on the body structure (Łaska-Mierzejewska & Łuczak 1996). Late maturing of the people who have the ectomorphic body structure was noti-

fied much earlier by other researchers like Tanner (Tanner 1963). The results of my own research prove the authenticity of the thesis.

Based on the results of the research, the following statements and conclusions may be drawn:

1. The vast majority of the science students at the University of Rzeszów have the leptosomic body structure.
2. Students who live in the village usually have wider shoulders and larger chest girths than those who come from the city. They are also much heavier.
3. The students from Rzeszów surveyed in 2009/2010 had heavier body structures than their peers of 1999/2000.
4. The female students at the University of Rzeszów does not differ with regard to the level of somatic features development from the students of other Polish universities.
5. Women with the sthenic body structure mature at the earliest, while those leptosomic body structure mature at the latest.
6. No relations between the place of living and the age of menarche were observed.

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BUDOWA SOMATYCZNA STUDENTEK UNIWERSYTETU RZESZOWSKIEGO

Streszczenie

Młodzież akademicka różnych środowisk od dawna jest przedmiotem licznych badań, w tym antropologicznych. Druga połowa XX wieku to zmiana zakresu obserwacji antropologicznych – z doboru rasowego na zagadnienia selekcji somatycznej młodzieży z różnych szkół i kierunków studiów. Głównym celem artykułu jest przedstawienie zróżnicowania typologicznego studentek kierunków przyrodniczych Uniwersytetu Rzeszowskiego w świetle typologii Kretschmera. Celami szczegółowymi są natomiast: zbadanie wpływu środowiska zamieszkania na budowę somatyczną studentek, określenie wpływu budowy ciała i środowiska zamieszkania na wiek menarche badanych studentek oraz porównanie tych wyników z rezultatami badań innych autorów w różnych ośrodkach akademickich w Polsce. W roku akademickim 2009/2010 dokonano pomiarów antropometrycznych 143 wybranych losowo studentek kierunków przyrodniczych na Wydziale Biologiczno-Rolniczym Uniwersytetu Rzeszowskiego, do badań zostały zakwalifikowane jedynie studentki studiów stacjonarnych. W pozycji stojącej zostały wykonane następujące pomiary: wysokości ciała (B-v), szerokości barków (a-a), szerokości bioder (ic-ic), obwodu klatki piersiowej (na poziomie punktu xi) oraz masy ciała. Dla każdej z tych cech obliczono następujące parametry statystyczne: średnią arytmetyczną (\bar{X}), odchylenie standardowe (Sd), wariancję (S_x), współczynnik zmienności (V) oraz wartość minimalną i maksymalną, w oparciu o te wartości porównane zostały cechy budowy ciała studentek pochodzących z różnych środowisk zamieszkania oraz różnych kierunków studiów. Oceny istotności statystycznej różnic w wartości badanych cech oraz różnic wieku menarche studentek pochodzących ze wsi i z miasta dokonano za pomocą testu t-Studenta ($p < 0,05$). Na podstawie danych uzyskanych z pomiarów somatometrycznych wyliczono następujące wskaźniki: Rohrera, wskaźnik barkowo-wzrostowy, wskaźnik biodrowo-wzrostowy, wskaźnik obwodu klatki piersiowej, wskaźnik BMI oraz tzw. wskaźnik Kretschmera. Na podstawie tych wskaźników określono typy budowy ciała studentek według typologii Kretschmera. Na podstawie badań ankietowych zebrano dane dotyczące warunków socjalno-bytowych i kolejności urodzenia oraz wieku menarche stu-

dentek: 1) zdecydowana większość studentek kierunków przyrodniczych Uniwersytetu Rzeszowskiego charakteryzowała się leptosomiczną budową ciała; 2) studentki mieszkające na wsi miały szersze barki, większy obwód klatki piersiowej od tych pochodzących z miasta, były również zdecydowanie cięższe; 3) kobiety o pyknicznej budowie ciała dojrzywały najwcześniej, zaś o budowie leptosomicznej najpóźniej; 4) młodzież żeńska UR nie odbiega poziomem rozwoju cech somatycznych od koleżanek z innych uczelni w Polsce; 5) nie stwierdzono zależności między środowiskiem zamieszkania a wiekiem menarche studentek; 6) studentki Rzeszowskie badane w roku akademickim 2009/2010 charakteryzują się mocniejszą budową ciała niż ich rówieśnice z lat 1999/2000.

Słowa kluczowe: młodzież akademicka, budowa ciała, typologia Kretschmera

