

ANTHROPOMETRIC STUDY

Occurrence of neoclassical facial canons in Caucasian primary school pupils and university students

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Abstract

Occurrence of Neoclassical Facial Canons in Caucasian Primary School Pupils and University Students.

Introduction: The study concentrates on nine neoclassical facial references, canons.

Sample and methods: These neoclassical canons are studied and compared in two groups of young Caucasian population as follows: 160 students were studied, namely 60 primary school boys at the age of seven and 100 young men at the age ranging from 22 to 25 studying at the Comenius University and Slovak Technical University in Bratislava. The following anthropometric parameters were measured: ten heights, five widths, and two angles.

Conclusion: Some of neoclassical canons have not appeared in our measured group at all. Other canons although present, were present less frequently than their variations. Comparisons with literature are discussed (*Tab. 9, Fig. 9, Ref. 7*). Full Text (Free, PDF) www.bmj.sk.

Key words: craniofacial parameters, inclination angles, anthropometric parameters, clinical practice, diagnostic criteria.

Measuring the head and facial parameters allows us to obtain valuable indications and diagnostic criteria as well as information potentially usable in clinical practice and art. These facial parameters are known to have been used to create the so-called canons, ideal values of beauty particularly occurring during the Renaissance period. Nevertheless, the above widely accepted canons have not been found to occur in recent population according to Slovak (Cvicoelová et al, 2005; Cvicoelová and Kološtová, 2005), and foreign authors (Farkas et al, 2005).

The aim of this study was to find out whether these nine aesthetic facial canons and their variations do occur in the present young population – boys from primary schools and universities in Bratislava.

Sample and methods

In the study, the following two groups of young people were measured: sixty primary school boys aged seven, and a hundred male university students of Natural Science and Medical School, Slovak Technical University, in Bratislava aged from twenty to twenty-five.

Standardised anthropological measurements were used (Knussman, 1988). The subjects were measured using standard

anthropologic tools. Studied were nine neoclassical facial canons as described by Farkas et al (1985 a).

Neoclassical canons

Four canons dealing with vertical measurements:

1st canon: Special head height (vertex -entocanthion, or v-en) = special face height (entocanthion-gnathion, or en-gn) (Fig. 1 A).

2nd canon: Forehead II (trichion-nasion, or tr-n) = nose length (nasion-subnasale, or n-sn) = lower face height (subnasale-gnathion, or sn-gn) (Fig. 2 A).

3rd canon: height of calva (vertex-trichion, or v-tr) = forehead height I (trichion-glabella, or tr-g) = special upperface height (glabella-subnasale, or g-sn) = lower face height (subnasale-gnathion, or sn-gn) (Fig. 3 A).

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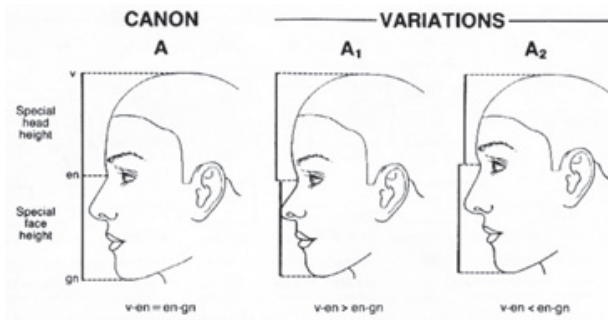


Fig. 1. 1st Two-section facial profile canon and its variations.

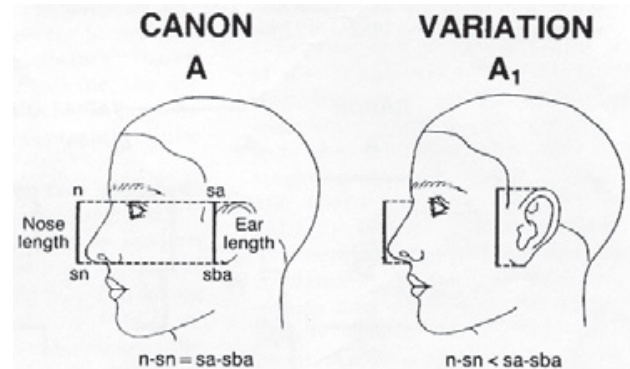


Fig. 4. 4th Nasoaural proportion canon and its variations.

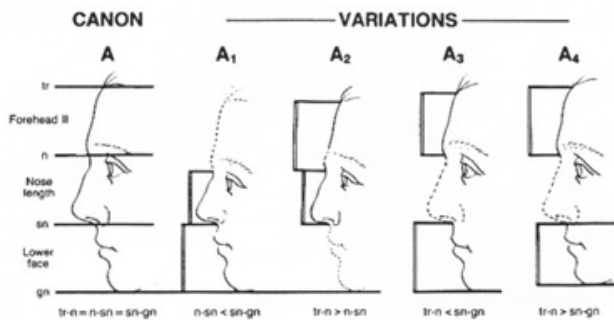


Fig. 2. 2nd Three-section facial profile canon and its variations.

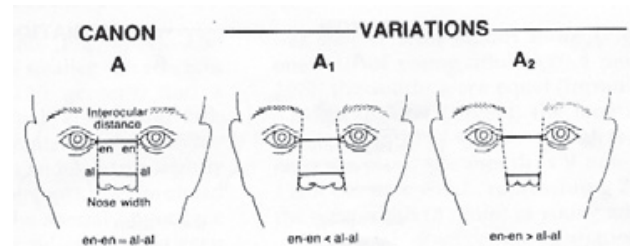


Fig. 5. 5th Orbitonasal proportion canon and its variations.

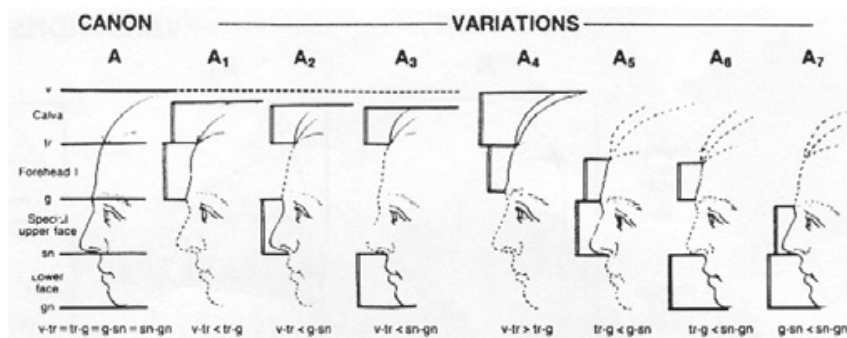


Fig. 3. 3rd Four-section facial profile canon and its variations.

4th canon: Nose length (nasion-subnasale, or n-sn) = ear length (supraaurale-subaurale, or sa-sba) (Fig. 4 A).

Further four canons define the horizontal relationships:

5th canon: Interocular distance (entocanthion-entocanthion, or en-en) = nose width (alare-alare, or al-al) (Fig. 5 A).

6th canon: Interocular distance (entocanthion-entocanthion, or en-en) = right or left eye fissure width (ektocanthion-entocanthion, or ex-en) (Fig. 6 A).

7th canon: Mouth width (cheilion-cheilion, or ch-ch) = 1/2 nose width (alare-alare, or al-al) (Fig. 7 A).

8th canon: nose width (alare-alare, or al-al) = 1/4 face width (zygion-zygion, or zy-zy) (Fig. 8 A).

The remaining canon evaluates the angles of inclination:

9th canon: Nasal bridge inclination = inclination of longitudinal axis of the auricle (Fig. 9 A).

Canons were considered valid only when the actual measurements did not differ by more than 1 mm or 2 degrees.

Results and discussion

Following are the measurements of facial parameters of students as described above.

Occurrence of each canon is given in both age groups, i.e. in children as well as in university students. This occurrence is also compared with measurements found in literature.

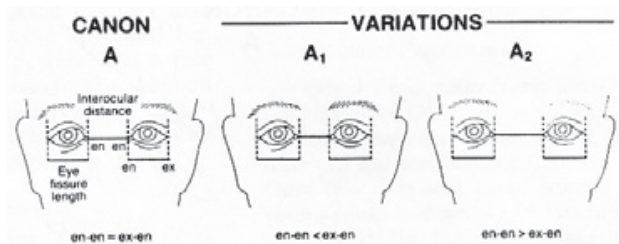


Fig. 6. 6th Orbital proportion canon and its variations.

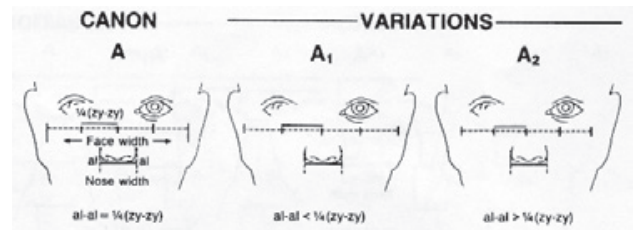


Fig. 8. 8th Nasofacial proportion canon and its variations.

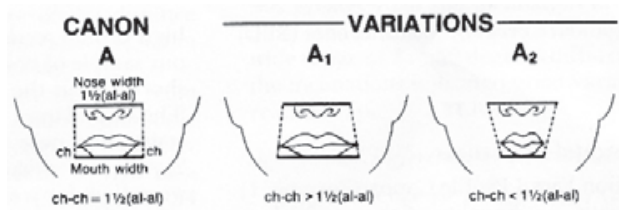


Fig. 7. 7th Naso-oral proportion canon and its variations.

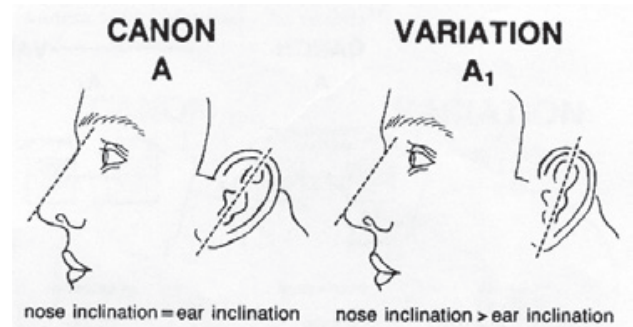


Fig. 9. 9th Nasoaural inclination canon and its variations.

Four canons dealing with vertical measurements

1st Two-section facial profile canon and the two proportion variations derived from it

This canon with special head height being equal to the special face height has not occurred in our group of seven-year-old boys at all. Nevertheless it occurred in 9 % of university students. In both groups, the second variation (Tab. 1) occurred in a significant majority. This is in agreement with the findings of Farkas et al (1985) who found the second variation to be present in 10 % of young North Americans.

2nd Three-section facial profile canon and four proportion variations derived from it

This canon with height of forehead I equal to height of nose, and height of lower face has not occurred in either of our groups,

which also agrees with the findings of Farkas et al (1985) in young North Americans.

In both groups, the second variation (Tab. 2) occurred in a significant majority.

3rd Four-section facial profile canon and seven proportion variations derived from it

This canon with height of calva equal to forehead I, special upper face height and lower face height has not occurred in either of our groups, which also agrees with the findings of Farkas et al (1985). This canon has seven variations (Tab. 3). In the group of children all seven variations were found. In the group of students only four variations were present. In the same study

Tab. 1. Occurrence of the 1st canon and its variations.

	n	Boys (n=60) %	m _p	n	Men (n=100) %	m _p
v-en = en-gn	–	–	–	9	9.00	2.86
v-en > en-gn	60	100.00	0.00	70	70.00	4.58
v-en < en-gn	–	–	–	21	21.00	4.07

Tab. 2. Occurrence of the 2nd canon and its variations.

	n	Boys (n=60) %	m _p	n	Men (n=100) %	m _p
tr-n = n-sn = sn-gn	–	–	–	–	–	–
n-sn < sn-gn	56	93.33	3.22	98	98.00	1.41
tr-n > n-sn	60	100.00	0	100	100.00	0
tr-n < sn-gn	–	–	–	18	18.00	3.84
tr-n > sn-gn	60	100.00	0	82	82.00	3.84

Tab. 3. Occurrence of the 3rd canon and its variations.

	Boys (n=60)			Men (n=100)		
	n	%	m _p	n	%	m _p
v-tr=tr-g=g-sn=sn-gn	–	–	–	–	–	–
v-tr < tr-g	42	70.00	5.92	–	–	–
v-tr < g-sn	44	73.33	5.71	–	–	–
v-tr < sn-gn	30	50.00	6.46	–	–	–
v-tr > tr-g	18	30.00	5.92	100	100.00	0.00
tr-g < g-sn	31	51.67	6.45	26	26.00	4.38
tr-g < sn-gn	10	16.67	4.81	40	40.00	4.90
g-sn < sn-gn	5	8.33	3.57	65	65.00	4.77

Tab. 4. Occurrence of the 4th canon and its variations.

	Boys (n=60)			Men (n=100)		
	n	%	m _p	n	%	m _p
n-sn = sa-sba	–	–	–	–	–	–
n-sn < sa-sba	60	100.00	0.00	100.00	100.00	0.00

Tab. 5. Occurrence of the 5th canon and its variations.

	Boys (n=60)			Men (n=100)		
	n	%	m _p	n	%	m _p
en-en = al-al	6	10.00	3.87	11	11.00	3.12
en-en < al-al	30	50.00	6.46	25	25.00	4.33
en-en > al-al	24	40.00	6.32	64	64.00	4.80

Tab. 6. Occurrence of the 6th canon and its variations.

	Boys (n=60)			Men (n=100)		
	n	%	m _p	n	%	m _p
en-en = ex-en	2	3.33	2.32	21	21.00	4.07
en-en < ex-en	29	48.33	6.45	6	6.00	2.37
en-en > ex-en	29	48.33	6.45	73	73.00	4.44

of Farkas et al (1985) all seven variations were present in the group of young North Americans 40–100 %.

4th Nasoaural proportion canon with one variation derived from it

This canon with the equal length of nose and length of ear has not occurred in either of our groups (Tab. 4). The only variation of this canon was found in 100% of our measured children and students. Farkas et al (1985) found this canon to be present in 4.9 % and its variation in 95.1 % of young North American population.

Out of the above four canons when taking into consideration height measurements we found only one canon to be present. This canon was present only in low percentage. Residual three canons have not occurred in our groups at all.

When compared to earlier Slovak literature, out of the above four canons, two were not present in a group of 19 to 22-year-old students (Cvickelová et al, 2005).

Four canons defining the horizontal relationships

5th Orbitonasal proportion canon and two variations derived from it

This canon with interocular distance equal to nose width has occurred in both our groups in the lowest percentage (10 and 11 % respectively) in comparison to its two variations (Tab. 5). Out of its variations, the first one occurred most often in boys and the second one most often in the group of men. As opposed to our findings Farkas et al (1985) found the presence of the canon per se in 40.8 % of young North Americans.

Tab. 7. Occurrence of the 7th canon and its variations.

	Boys (n=60)			Men (n=100)		
	n	%	m _p	n	%	m _p
ch-ch = 1 1/2 al-al	1	1.66	1.65	5	5.00	2.17
ch-ch > 1 1/2 al-al	13	21.67	5.32	63	63.00	4.83
ch-ch < 1 1/2 al-al	46	76.67	5.46	32	32.00	4.66

Tab. 8. Occurrence of the 8th canon and its variations.

	Boys (n=60)			Men (n=100)		
	n	%	m _p	n	%	m _p
al-al = 1/4 zy-zy	7	11.67	4.14	7	7.00	2.55
al-al < 1/4 zy-zy	43	71.67	5.81	67	67.00	4.70
al-al > 1/4 zy-zy	10	16.66	4.81	26	26.00	4.39

Tab. 9. Occurrence of the 9th canon and its variation.

	Boys (n=60)			Men (n=100)		
	n	%	m _p	n	%	m _p
inc.nose=inc.ear	3	5.00	2.81	1	1.00	0.99
inc.nose>inc. ear	57	95.00	2.81	99	99.00	0.99

6th Orbital proportion canon and two variations derived from it

This canon with interocular distance equal to right eye fissure width has occurred in boys in the lowest percentage and contrariwise to men in a significantly higher proportion. In the group of men the least frequent was the first variation (Tab. 6). When compared to our results, Farkas et al (1985) found a significantly higher occurrence of the canon per se (33 %).

7th Naso-oral proportion canon and two variations derived from it

This canon, in which the width of mouth is equal to 1 1/2 of the width of the nose has occurred least frequently in either of our groups when compared to its variations (Tab. 7). In the group of young North American (Farkas et al, 1985) the occurrence of the canon is higher (20.4 %).

8th Nasofacial proportion canon and two variations derived from it

This canon with the nose width equal to 1/4 of the width of the face has occurred least frequently in either of our groups when compared to its two variations (Tab. 8). In both of our groups the first variation occurred most frequently. In the group of young North American, (Farkas et al, 1985) the occurrence of the canon is significantly higher (36.9 %) when compared to our findings.

Out of the above four canons, when taking into consideration the width measurements, we have found their presence in our groups. The percentage of their occurrence nevertheless was in all cases lower than that of their variations.

When compared to earlier Slovak literature, the above four canons were present in a group of 19 to 22-year-old students studied by Cvičelová et al (2005).

One canon evaluating the angles of inclination*9th Nasoaural inclination canon with one variation derived from it*

This canon, with the nasal bridge inclination being parallel to the inclination of the longitudinal medial axis of the ear, occurred in our measured groups in very low percentage. The highest percentage of occurrence was in its variation (Tab. 9). When compared to our findings (Farkas et al, 1985) found higher proportion of the canon per se in the population of young North Americans (8.9 %).

Conclusions

Our results similar to other Slovak as well as overseas studies show that facial proportions represented by canons in the current young generation do not mirror the widely known variability of facial proportions.

The neoclassical canons representing equality of craniofacial parameters have occurred in the studied groups only infrequently. The higher frequency was presented by the variations of these canons.

Our results show that the use of these canons for clinical application and forensic anthropology is very limited.

References

1. **Cvíčelova M, Beňuš R, Kapustová A.** Vertikálne a horizontálne proporcie tváre 19- až 22-ročných študentov z Bratislavy. *Slov Antropol* 2005; 8 (1): 40—42.
2. **Cvíčelova M, Kološťová A.** Vyskytujú sa neoklasické kánony u súčasných mladých mužov študujúcich v Bratislave? *Slov Antropol* 2005; 8 (2): 49—53.
3. **Dawei W, Gouzheng Q, Mingli Z, Farkas LG.** Differences in Horizontal, Neoclassical Facial Canons in Chinese (Han) and North American Caucasian Populations. *Aest Plas Surg* 1997; 21: 265—269.
4. **Farkas LG, Hreczko TA, Kolar JC, Munro IR.** Vertical and Horizontal Proportions of the Face in Young Adult North American Caucasians: Revision of Neoclassical Canons. *Plast Reconstr Surg* 1985; 24: 179—184.
5. **Farkas LG, Hreczko TA, Kolar JC, Munro IR.** Vertical and Horizontal Proportions of the Face in Young Adult North American Caucasians: Revision of Neoclassical Canons. *Plast Reconstr Surg* 1985 a; 75 (3): 328—337.
6. **Farkas LG, Katic MJ, Forrest CR et al.** International Anthropometric Study of Facial Morphology in Various Ethnic Groups/Races. *J Craniofacial Surg* 2005; 16 (4): 615—646.
7. **Knussmann R.** Somatometrie. 232-285. In: Knussmann R, Schwidetzky I, Jurgens HW, Ziegelmayr G. *Anthropologie. 1 Teil.* Stuttgart; Gustav Fischer Verlag 1988.

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