

## Changes in the Cephaloscopic Characteristics of Schoolchildren from Sofia Aged 8-14 Years

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Changes in skin colour, eyes and hair, nose structure, cheekbone swelling and epicanthus in 168 boys and 156 girls at the age from 8 to 14 years from the city of Sofia have been traced. In all age groups the fair skin is prevalent, with a growing per cent of the light mat skin after 12. Between 8 and 12 brown hair are predominant and brown-black at 14. The eyes remain almost unchanged with the black-brown ones prevailing. The nose form in the 8-year-old is equally concave and straight while in the 14-year-old the concave forms have considerably decreased while the straight and convex ones have augmented. The per cent of children with epicanthus has also dropped while the frequency of the well-developed cheekbones has risen. The changes recorded are more dynamic in the nose structure, the cheekbone swelling and hair colour.

*Key words:* cephaloscopy, children, longitudinal investigation, age-related alterations, intersexual differences.

### Introduction

The structure of the soft tissues of the face and colour of skin, eyes and hair though genetically predetermined continue to take shape in the postnatal period and are subjected to specific changes with age [4]. The major purpose for undertaking the present investigation is to trace the dynamics of the age-related changes of the main cephaloscopic features — skin colour, eye and hair colour, nose structure, cheekbone swelling and the presence of epicanthus as well as to reveal the features of sexual dimorphism.

The presented results are a stage of the project on “Longitudinal-transversal investigation of the physical development and sexual maturation of schoolchildren from Sofia aged 7-17 years”.

### Material and Methods

168 boys and 156 girls between 8 and 14 years of age from four Sofia schools have been the object of investigation. The study is being carried out from 1993 (October-

November) after the classical method of M a r t i n, S a l l e r [1]. Until the year 2000 the investigation is longitudinal after which it is combined with a transversal one. The age-related changes of 10 cephaloscopic features have been traced and analyzed. These are: colour of skin, hair and eyes, nose form, bone and cartilage profile, nose apex, nose orifice form, degree of cheekbone swelling and the presence of epicanthus.

## Results and Discussion

### Skin colour

It has been recorded in three categories of the fair skin characteristic of the Europeid race: fair (1), light mat (2) and mat (3). In all groups the fair skin is predominant with the gradual increase of the frequency of the light mat throughout the period under study (Fig. 1). Up to the 12th year of age the per cent of the fair skin is higher in the boys while in the 14-year-old it drops abruptly and remains lower than the one in the girls' sample.

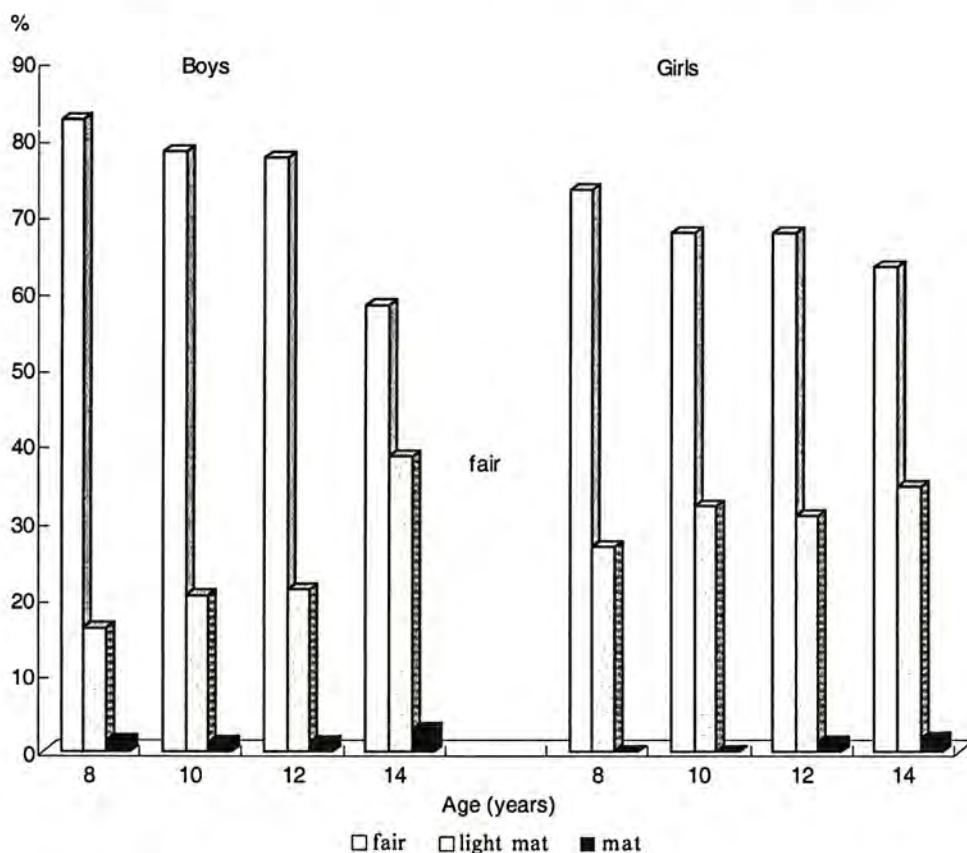


Fig. 1. Skin colour

### Hair colour

It has been recorded after the scale of Fischer-Saller grouped in the following categories: light blonde (B-E), blonde (F-L), brown (P-T), brown-black (U-Y) and reddish (I-VI). Between 8 and 12 years of age brown hair is prevalent and at 14 the per cent of the brown-black hair has considerably risen (Fig. 4). While in the 8-year-old children 11.9% of the boys and 16.9% of the girls are with blonde hair in the 14-year-old only 5% of the girls and 8.5% of the boys remain with blonde hair. The hair is brown in 23.8% of the boys and in 41.3% of the girls and with brown-black hair are 67.7% and 5.7% respectively.

### Eye colour

It has been assessed after the 12-degree scale comprising the following categories: black-brown (1-2), brown (3-4), mixed (5-7), blue (8-10) and gray-blue (11-12). Black-brown eyes are dominating followed by the mixed ones. The changes in the eye-colour

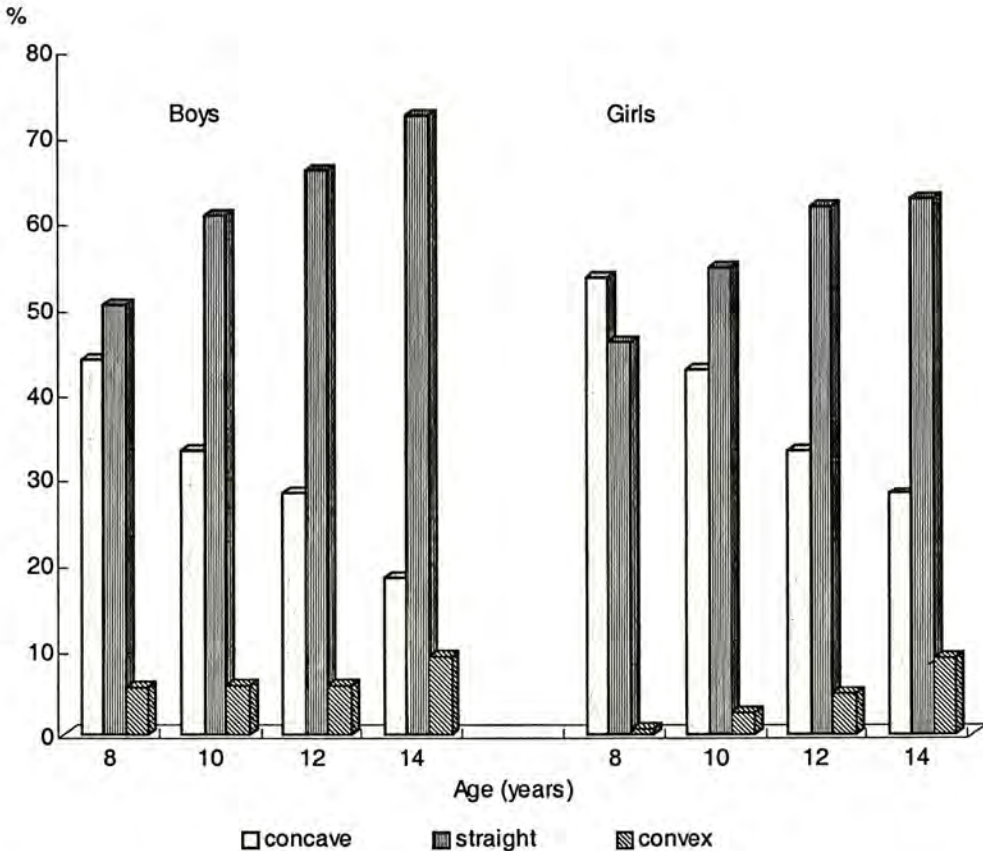


Fig. 2. Nose form

are insignificant in both sexes, the ratios between the different categories being basically preserved (Fig. 3). At the age of 14, 35.4% of the boys and 41.3% of the girls are with black-brown eyes and 23.8% and 13.2% are with brown eyes. 25.2% of the boys and 28.9 of the girls are with mixed eyes and with blue eyes — 14.6% and 16.5% respectively.

### Nose structure

The nose form has been evaluated after a 15-degree scale: concave (1-5), straight (6-10) and convex (11-15). In the 8-year-old children the straight and concave forms are spread at an almost equal frequency while in the 14-year-old the concave noses have considerably diminished and the straight and convex ones have increased in number (Fig. 2).

The profiles of the nose-bone and the nose-cartilage bases were defined after a 3-degree scale: concave, straight and convex. Their changes correspond to the changes in the general nose form, however, the changes in the profile of the nose-bone base preceding the ones in the profile of the nose-cartilage base.

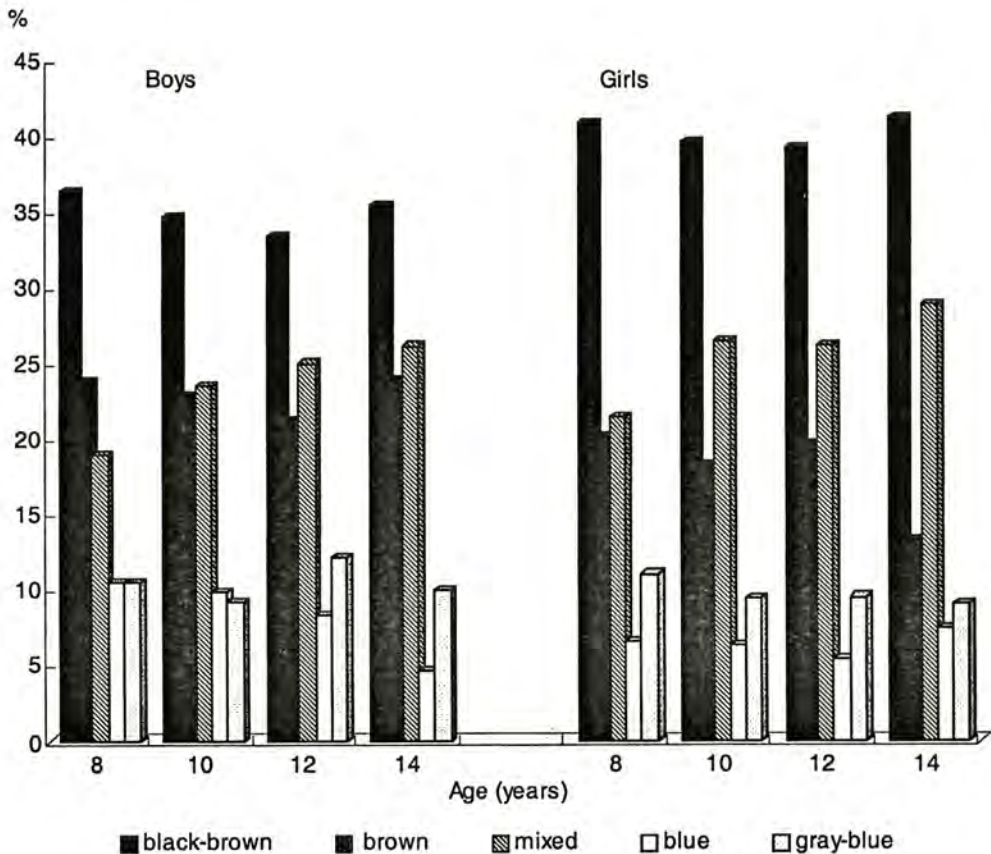


Fig. 3. Eye colour



The nose apex is defined according to the direction it follows: upward, forward and downward. The observed age alterations in the direction of the nose apex are significant and correspond to the changes in the general nose form. In the 8-year-olds the nose apex is equally often pointed upward and forward and in the 14-year-old boys and girls noses with an apex pointed forward predominate and the frequency of the forms pointed downward is somewhat increased (Fig. 5).

The nose orifice form is defined as round, triangular and oval. In all groups it is the oval shapes that prevail with an abrupt diminution of the round shapes' per cent between 8 and 10 years of age (Fig. 6).

### Cheekbone swelling

It has been defined after the 3-degree scale: slightly (1), moderately (2) and strongly pronounced (3). At the age of 8 faces with slightly pronounced cheekbones are predominant in both sexes. In the girls' sample even as early as the age of 12 the moder-

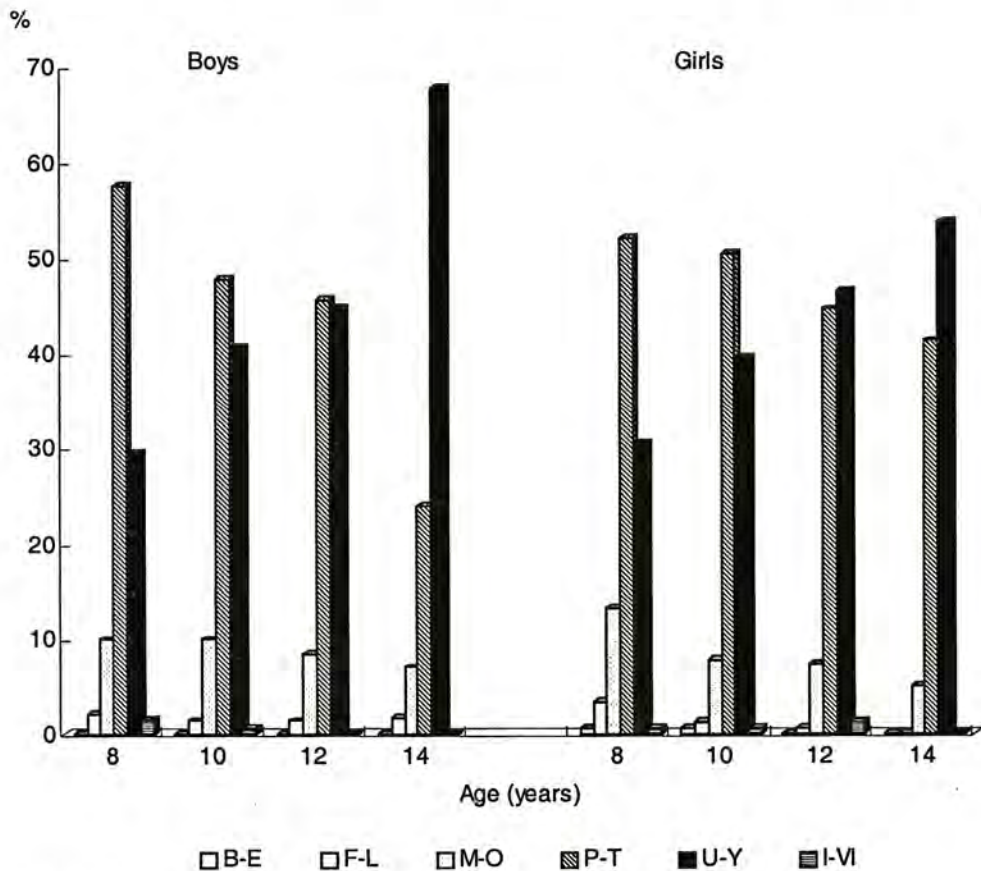


Fig. 4. Hair colour

ately pronounced cheekbones are more frequent and the faces with strongly pronounced cheekbones have grown in number very fast (Fig. 7).

### Epicanthus

The presence of epicanthus is registered in 3 degrees: missing (0), slightly pronounced (1) and strongly pronounced (2). With age the per cent of children with presence of epicanthus decreases (Fig. 8). Even as early as the age of 8 years the strongly pronounced epicanthus is spread in less than 3% of the children of both sexes and in 82.5% it is totally missing.

### Combination of eye colour and hair colour

The combinations of the eye colour and hair colour have been investigated in the 14-year-old students. In the boys' sample the combination of dark hair and dark eyes has a clear-cut prevalence. A more frequent combination is the one between the black hair

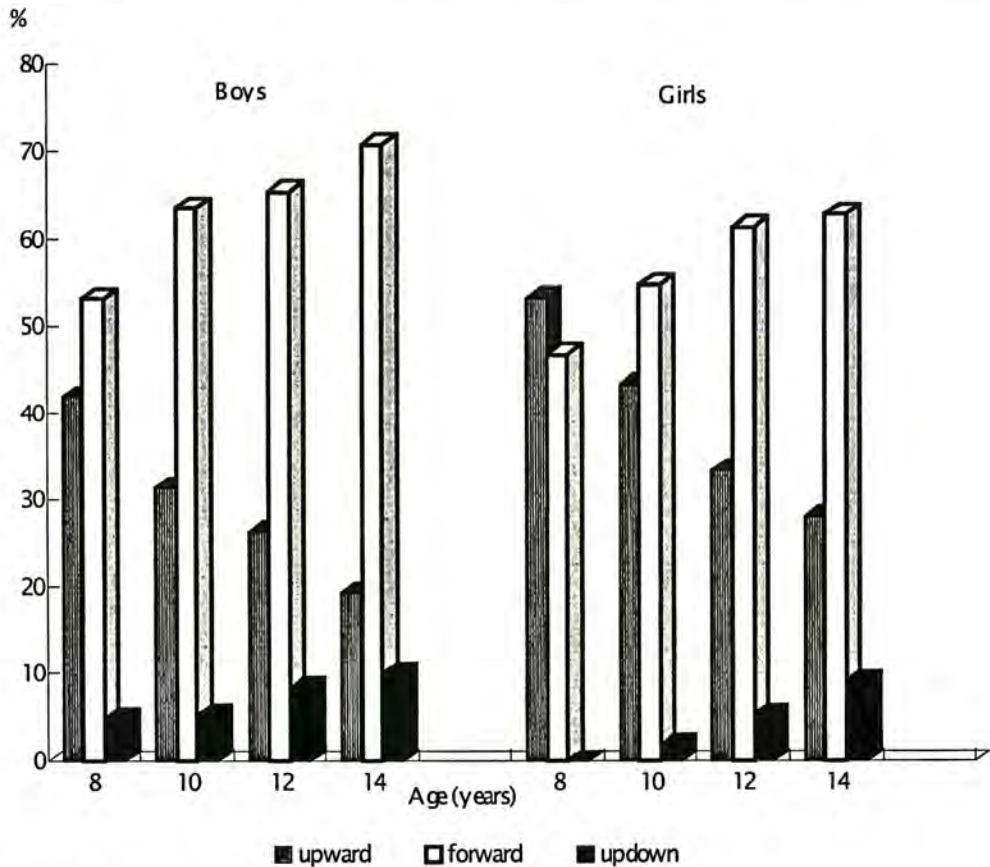


Fig. 5. Nose apex

and black-brown or light-brown eyes (42.5%). The combination of dark hair with mixed eye colour ranks second in incidence (26.1%), the pairing with black-brown hair being in a higher percentage than the one with the brown hair. Brown hair ranks third often combined with light brown and more rarely with black-brown eyes (14.2%). The combination of dark (mainly brown) hair with light coloured eyes (8.2%), the eyes' being more frequently gray-blue is rare. The per cent of children with light-coloured hair and light eyes (6.8%) is very small and most seldom are spread the children with blonde hair and dark eyes (2.2%).

In the girls' sample the combination of the hair and eyes of the dark colours is again predominating (51.6%) the better part of which being with brown-black hair and black-brown eyes. Here again the second place is held by the combination of dark hair with mixed eye colour (23.0%). In contrast to the boys the combination of dark hair and light-coloured eyes (18.2%) is much more widely spread here. Among the light-haired girls more frequent are the mixed and gray-blue eyes, bright blue eyes were found in just one child and a combination with dark eyes has never been discovered.

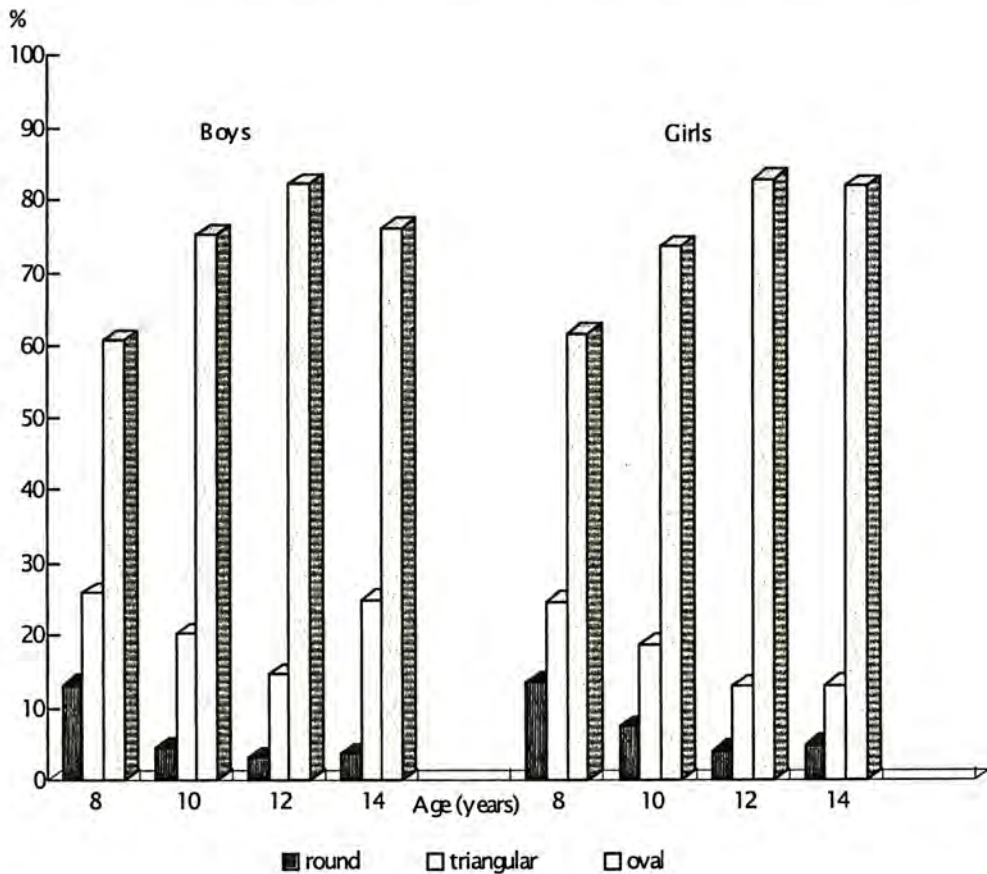


Fig. 6. Nose orifice form



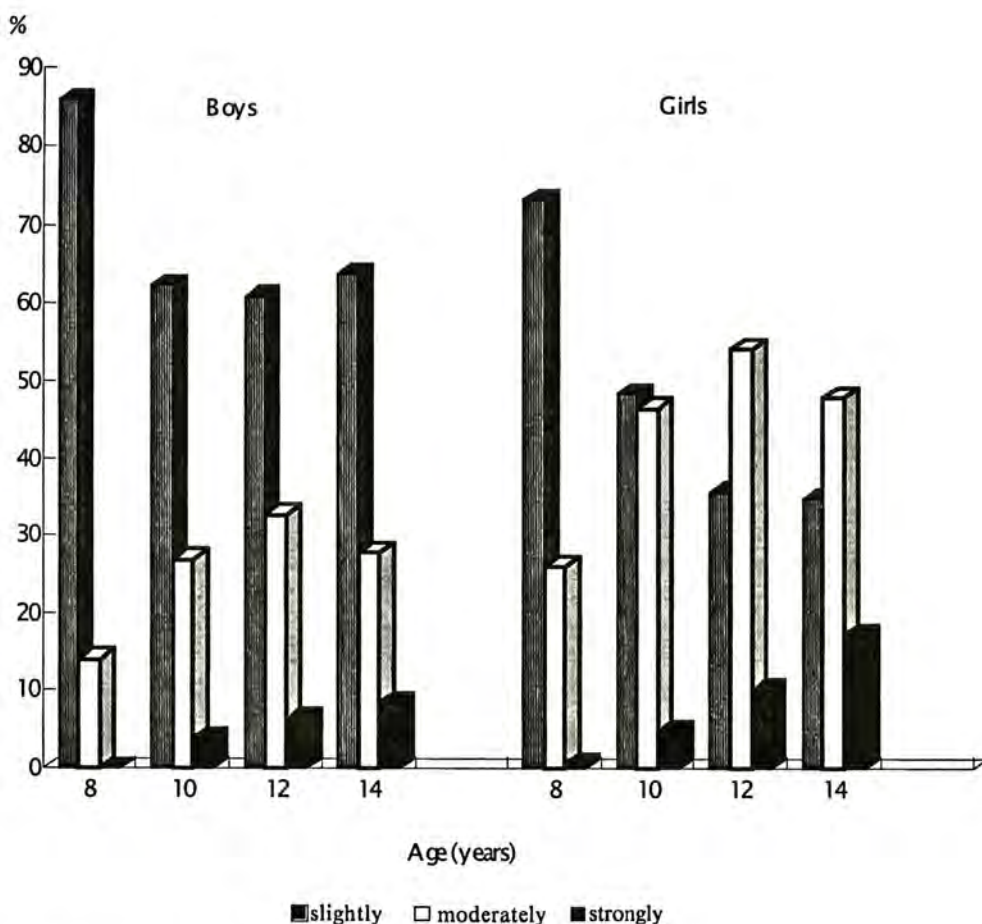


Fig. 7. Cheekbone swelling

Tracing the changes in the pigmentation of Bulgarian children back to the beginning of the 20th century (1904-1906) we have established very close values in the per cent distribution of the mat, mixed and light types [3]. 55.7% of the boys and girls between 10 and 15 years of age are with dark hair and eyes, blonde and light-eyed are 6.9% and 37.4% account for the mixed types. This testifies to the tendency of preserving the basic cephaloscopic features almost unaltered during the past century.

Comparing our results with data from a longitudinal investigation of students from Ljubljana [2] we detect significant differences in the colouring of the eyes and hair with identical tendencies in the age-related changes. Blonde hair in Slovenian children is four times more widespread while the brown-black one is twice rarer. The combinations with the eye colour confirm the considerably higher per cent of the light types in the students from Ljubljana (33.3 % of them are with blonde hair and light eyes).



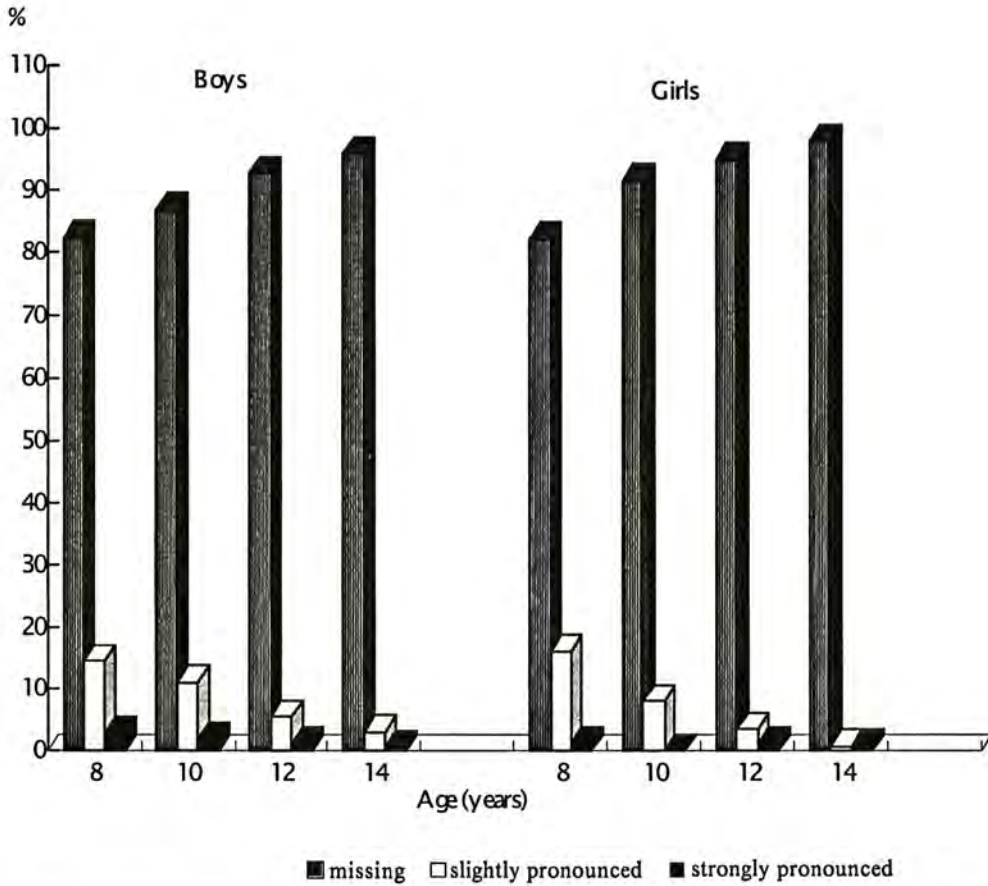


Fig. 8. Epicanthus

### Conclusion

The observed age-related changes of the cephaloscopic features at the age from 8 to 14 years are most dynamic in the nose structure and the degree of cheekbone swelling followed by the hair colour and skin colour. Most weakly pronounced are the changes in the eye-colour and the presence of epicanthus.

The combination of dark hair with dark eyes is found in over 50% of the children under study. The mixed types are represented mainly by the combination of dark hair with mixed or gray-blue eyes. Blonde children account for less than 10% and the blue-eyed are more often boys while in the girls sample the ones with mixed colour are of greater incidence.

The ratios between children with dark, mixed and light pigmentation has been preserved almost unaltered throughout the past century.

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