

Facial analysis and facial types of the students in Mosul University, aged 20-25 years, with class one normal occlusion: The direct method

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ABSTRACT

This study was accomplished with aim in mind that facial feature differences in facial types, differences between sexes of the same face type of the population in Mosul University would be made clear. The direct method for facial analysis was followed selecting a sample of (95) males and (89) females with class one normal occlusion and they were within (20 - 25) years of age.

The sample was divided into (3) groups according to the type of the face as square face group; oval face group and tapered face group, (22) horizontal and vertical measurement were recorded for each subject.

Key Words: Facial type, class I normal occlusion, analysis.

الخلاصة

إن هدف هذا البحث هو دراسة ملامح الوجه والفوارق بين أنواع الوجه بالنسبة لمنتسبي جامعة الموصل لتصبح واضحة للدارس.
طُبِّقَت هذه الدراسة على عينة مختارة من (٩٥) حالة من الذكور و(٨٩) حالة من الإناث وكلهم مصنّفون من الصنف الأول للإطباق الطبيعي للأسنان، وكانت أعمارهم تتراوح بين (٢٠ - ٢٥) سنة. تم تقسيم العينة إلى ثلاثة مجاميع حسب نوع الوجه سواء أكان مربعاً، بيضوياً أم مدبباً، وتم تسجيل (٢٢) قياس: أفقي وعمودي لكل حالة.

INTRODUCTION

It might be expected that faces would display some common features, but they are often as different from each other as they are from the rest of us. If we are able to accept that appreciation of facial beauty is innate, then presumably it must depend on recognizable difference in our faces. If so then it should be possible to define and measure them.

One of the objectives of the orthodontic treatment is the improvement of facial appearance; therefore it is necessary to be able to define the good looking face. The introduction of anthropologic direct method, for measurement of facial features was first practiced by Hellman⁽¹⁾ for orthodontic purposes.

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Unfortunately early man had little time to contemplate natural beauty seriously. Life in the stone age was a formidable task survival was everyone's preoccupation⁽²⁾.

It was not until the renaissance in the fifteenth century that realistic values once more concerned western civilization.

Early in the sixteenth century, the Italian named Fiven Zuola (1646) wrote a book detailing feminine beauty of the perfect profile. A rather objective study of human facial esthetic was introduced by Woolnoth (1865) of facial classification, he wrote the general form and outline of all the faces especially as they are seen in profile are of three orders; the straight, the convex and the concave.

There are five components considered to be the major aesthetic masses of the face⁽³⁾. The forehead, the eyes, the nose, the lips, the chin and the cheeks.

The general form and outline of all faces especially as they are seen in profile are of three types: the straight, the convex and the concave. Powell and Humphreys⁽³⁾ described the face, as seen in the frontal views either round, or oval, or square diamond or pear shape type.

Powell and Humphreys⁽³⁾ also mentioned several factors affect esthetic of the face; among them the most widely known are: Age, sex, body type, hair, race, occlusion and eruption of the teeth, skeletal factors and development abnormalities.

Several techniques have been used to study the face, and the most widely known methods are:

1. The direct method on the patient face.
2. The use of cephalometry radiograph.
3. The use of facial photograph.
4. The use of photogrammetry and stereo photogrammetry.

Graber⁽⁴⁾ described three facial types: The Brachycephalic is likely to have a broad dental arch- Use Mesocephalic probably have an average dental arch form. The Dolichocephalic is most likely to have a long and narrow dental arch.

Principles and Components of Facial Examination

1. Examination should not be based on static laboratory, x-ray film and photographs of the patient alone⁽⁵⁾.
2. Natural head posture, centric occlusion and relaxed lip posture can be assessed and maintained in the office so that valid examination data can be collected⁽⁶⁾.
3. The components of facial examination include data about dento-facial proportions and esthetic⁽⁷⁾.

In this study, efforts have been made to establish the standard forms of the students in the University of Mosul and to declare differences among different sexes aiming at serving the orthodontic profession in our country.

MATERIALS AND METHOD

Materials

The sample consists of (184) students (89 females and 95 males). The subjects were selected on the basis of the following criteria: Having class one normal occlusion, having no facial asymmetry, having no previous orthodontic treatment,

having no genetic abnormalities, having normal oronasal breathing, having mild crowding (up to 4mm), and being Iraqi and born in the center of Mosul.

Two Japanese Mitatoya calipers were used both are calibrated to measure precisely to the (0.02) of a millimetre.

The Method

Before making measurements, it is important to practice identifying and locating the landmarks by inspection and palpation, and to be well trained in order to take the readings in the proper way.

Seventeen facial landmarks were selected for making the measurements (figure1). Measurements were established for each student in the sitting position in a chair other than the dental chair, sitting in upright position with a supported head and looking at the mirror on the wall. The visual axis was adjusted by keeping the mirror at the same height as the height of the student eye to the horizontal plane which was measured before fixing the minor (2 meters).

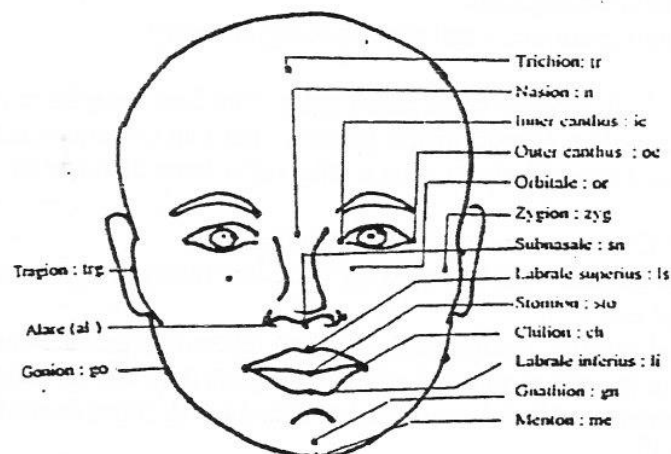


Figure (1): Soft tissue facial landmarks

Every reading was done by keeping the calipers in contact with the soft points with minimum pressure. Then the reading of every distance was done twice and the two measurements for every distance were recorded, the average of them was considered the final reading⁽⁸⁾.

The horizontal measurements used in this study are shown in figure (2), and the vertical measurements are shown in figure (3).

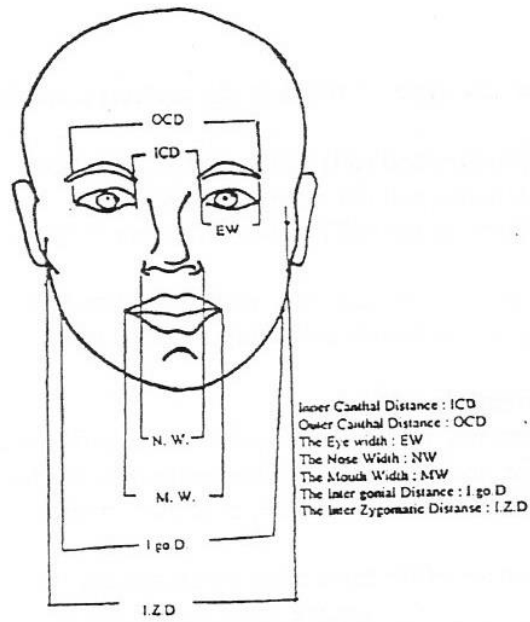


Figure (2): Horizontal facial measurements

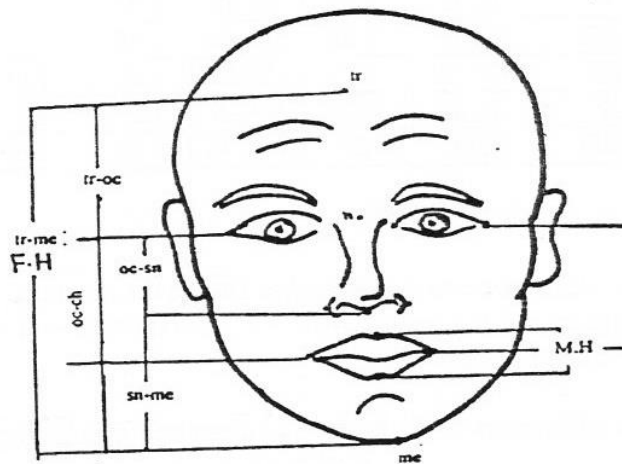


Fig (3.) : Vertical Facial Measurements

Facial height F/H : tr-me
 Eye forehead distance : tr-oc
 Eye-nose distance : oc-sn
 Eye mouth distance : oc-ch
 Eye-chin distance : oc-me
 Lower third of the face : sn-me
 Height of the mouth : M H

Figure (3): Vertical facial measurements

RESULTS

According to the type of the face the subjects were divided into three groups as follows:

1. A group of (31) females and (60) males with square faces.
2. A group of (47) females and (8) males with oval face.
3. A group of (11) females and (27) males with tapered faces.

From these groups we see that majority of male subjects have square faces where as the majority of the female subjects have oval faces.

Horizontal Facial Measurements

The measurements for the males showed significant differences, which were higher than those for the females, the measurements for the inner canthal distance, however, showed no significant difference, as shown in table (1).

Table (1): The differences of the horizontal measurements between the two sexes with square faces in mm

No.	Variable	Female (n =31)		Male (n =60)		t-value	d.f	Sig
		Mean	S.D	Mean	S.D			
1	ICD	30.72	2.74	32.03	5.06	1.35	89	N.S
2	EW	30.08	1.43	33.21	1.84	2.98	89	S
3	MW	50.10	2.50	52.12	3.51	4.26	89	S
4	NW	34.48	2.11	38.02	2.87	6.06	89	S
5	I.goD	113.87	5.68	123.30	6.88	5.87	89	S
6	I.ZD	123.12	5.29	126.26	7.62	2.05	89	S
7	LF	85.83	4.00	90.76	5.89	4.14	89	S
8	OCD	98.96	6.0	104.44	4.19	5.69	89	S

All the measurements (except those for the inner canthal distance and the nose width) were higher for the males than for the females, i.e. they showed significant differences, as shown in table (2).

Table (2): The differences of the horizontal measurements between the two sexes with oval faces in mm

No.	Variable	Female (n =47)		Male (n =8)		t-value	d.f	Sig
		Mean	S.D	Mean	S.D			
1	ICD	31.68	7.97	33.72	3.36	0.71	53	N.S
2	EW	30.38	1.99	34.04	1.36	2.26	53	S
3	MW	48.57	3.06	53.71	1.60	4.62	53	S
4	NW	34.35	5.12	36.07	2.90	1.99	53	N.S
5	I.go.D	114.15	7.32	128.12	5.97	5.10	53	S
6	I.Z.D	126.17	7.37	134.15	4.93	2.94	53	S
7	LF	84.50	10.60	134.50	3.35	2.39	53	S
8	OCD	99.11	6.02	106.15	2.64	3.24	53	S

These measurements showed significant differences between males and females (they were higher for males), in nose width, intergonial distance and interzygomatic distance, as shown in table (3).

On the other hand, they show no significant differences between the two sexes in inner canthal distance, eye width, mouth width, and outer canthal distance.

Table (3): The differences of the horizontal measurements between the two sexes with tapered faces in mm

No.	Variable	Female (n =11)		Male (n =27)		t-value	d.f	Sig
		Mean	S.D	Mean	S.D			
1	ICD	31.28	2.96	31.23	2.90	0.06	36	N.S
2	EW	32.95	1.18	32.80	2.00	0.22	36	N.S
3	MW	49.12	1.84	51.68	4.26	1.99	36	N.S
4	NW	33.12	2.15	37.62	2.51	5.20	36	S
5	I.go.D	108.76	5.61	120.50	11.70	3.15	36	S
6	I. Z.D	120.87	4.38	124.74	5.63	2.04	36	S
7	L.F	84.30	1.86	89.91	3.79	4.66	36	S
8	OCD	97.18	2.70	96.84	4.83	0.22	36	N.S

Vertical Facial Measurements

The males had higher measurements than the females in the eye-forehead distance, the eye-Mouth distance, eye-chin distance, the length of the upper lip, the length of the lower lip, the length of the nose, the upper third of the face, the lower third of the face, and in the total length of the face. On the other hand, no significant differences were found in the eye-nose distance, the length of the vermilion margins of both upper and lower lips, the middle third of the face, and the height of the mouth, as shown in table (4).

Table (4): The difference of the vertical measurements between the two sexes with square faces in mm

No.	Variable	Female (n =31)		Male (n =60)		t-value	d.f	Sig
		Mean	S.D	Mean	S.D			
1	tr-oc	62.45	5.83	65.52	7.24	-2.04	89	S
2	oc-sit	46.80	2.66	49.45	7.20	-1.97	89	N.S
3	oc-cli	64.87	3.26	69.41	3.47	-6.03	89	S
4	oc-me	105.09	5.44	114.93	5.00	-8.63	89	S
5	sn-sto	19.95	2.08	21.99	2.95	-3.44	89	S
6	sto-gn	35.11	3.13	40.66	3.31	7.73	89	S
7	Is.sto	7.37	1.09	7.79	1.25	-1.58	89	N.S
8	li-sto	9.81	1.33	9.84	1.58	-0.1	89	N.S
9	n-sn	52.79	3.34	54.63	3.46	-2.44	89	S
10	tr-eybr	46.20	5.48	49.53	6.47	-2.44	89	S
11	eyhr-sn	62.88	4.08	64.11	5.17	1.15	89	N.S
12	sn-me	60.66	4.6	68.95	5.32	-7.36	89	S
13	H.F	169.74	8.68	182.6	10.30	-5.94	89	S
14	H.M	17.18	2.03	17.63	2.54	-5.85	89	N.S

There were significant differences between the males and females in the eye-forehead distance, the eye-nose distance, the eye-mouth distance, the eye-chin distance, the length of the lower lip, the length of the nose, the upper third of the face, the middle third, the lower third of the face, and the total length of the face, these measurements were higher for the males. But there were no significant differences between the two sexes in the length of the upper lip, the length of the vermilion margins of both the upper and lower lips, and in the height of the mouth, as shown in table (5).

Table (5): The differences of the vertical measurements between the two sexes with oval faces in mm

No.	Variable	Female (n=47)		Male (n=8)		t-value	d.f	Sig.
		Mean	S.D	Mean	S.D			
1	tr-oc	64.12	6.36	69.00	6.38	-2.01	53	S
2	oc-sn	46.92	2.57	51.40	5.53	-3.75	53	S
3	oc-ch	65.56	2.95	71.22	4.68	-4.58	53	S
4	oc-me	105.68	5.28	118.89	6.86	-6.26	53	S
5	sn-sto	20.54	2.89	22.18	2.62	-1.5	53	N.S
6	sto-gn	35.78	2.72	43.40	3.67	-6.95	53	S
7	Is.sro	7.79	0.83	7.63	1.5	0.44	53	N.S
8	H-sto	10.7	6.53	10.28	1.68	0.18	53	N.S
9	n-sn	53.28	3.29	57.86	4.51	-3.44	53	S
10	tr-eybr	47.54	6.73	56.90	18.70	-2.64	53	S
11	eybr-sn	63.33	3.85	68.56	4.77	-3.43	53	S
12	sn-me	62.14	5.08	69.52	5.91	-3.71	53	S
13	H.F	173.01	8.56	195.00	14.80	-5.96	53	S
14	H.M	8.49	6.72	17.91	3.05	0.24	53	N.S

The males had higher-measurements than the females in all the vertical measurements except for the length of the vermilion margins of both the upper and lower lips, the length of the nose, and the height of the mouth where no significant differences were found, as shown in table (6).

Table (6): The difference of the vertical measurements between the two sexes with tapered faces in mm

No.	Variable	Female (n=11)		Male (n=27)		t-value	d.f	Sig.
		Mean	S.D	Mean	S.D			
1	tr-oc	61.87	6.35	68.73	7.38	-2.70	36	S
2	oc-sn	47.38	1.99	49.51	3.17	-2.06	36	S
3	oc-ch	65.38	3.00	69.49	3.04	-3.80	36	S
4	oc-me	104.18	7.39	114.86	4.54	-5.45	36	S
5	sn-sto	18.48	2.73	22.22	1.93	-4.80	36	S
6	sto-gn	35.97	4.72	42.00	3.82	-4.12	36	S
7	Is.sro	7.09	0.65	7.53	1.21	-1.13	36	N.S
8	H-sto	9.02	.41	10.52	1.52	-1.91	36	N.S
9	n-sn	55.08	3.54	57.04	4.20	-1.36	36	N.S
10	tr-eybr	46.30	5.25	51.80	6.58	-2.14	36	S
11	eybr-sn	63.60	4.56	67.33	5.31	-2.14	36	S
12	sn-me	59.81	5.38	69.70	4.27	-6.01	36	S
13	H.F	169.70	10.20	188.10	10.60	-4.78	36	S
14	H.M	16.11	1.90	17.57	2.47	-1.76	36	N.S

DISCUSSION

In this study and back to the tables of horizontal and vertical measurements the difference was expressed as significant, i.e. higher in males or non-significant difference but no measurements showed significant difference, i.e. higher in females, in the three types of faces

Farkas *et al.* ⁽⁹⁾ found that some facial measurements are equal in both sexes, while others are higher in males than in females but no measurements was found to be higher in females. Nasir ⁽¹⁰⁾ concluded that all facial measurements of young adult males were higher than those in females.

Development and growth of the face are influenced by sexual as well as genetic factors. Sex difference is not significant during childhood, but becomes so with the development of other secondary characteristic and it is significant at adolescent ⁽¹¹⁾.

CONCLUSION

- Facial measurements in general were higher in males than in females in the three types of the faces.
- The inner canthal distance showed no significant difference between the two sexes in the three types of the face.
- The difference between the sexes were more distinctive and higher in the group with oval face group and tapered face group axe less distinctive.
- The majority of the males were having square laces than the tapered face group and the least were having square faces.
- The majority of the females were having oval face than the tempered face group and the least were having square faces.
- Organization of the sample according to the type of the face into three categories was the main reason for differences seen between results of this study and other studies.

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