



## Preference between Mexican and South Korean college students regarding facial profile and the lower anterior facial third

### *Preferencia entre alumnos universitarios de México y Corea del Sur con respecto al perfil y el tercio inferior de la cara*

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#### ABSTRACT

**Objective:** To assess the preference regarding facial profile among a community of young students in South Korea and Mexico in 2012. **Material and Methods:** 400 surveys were conducted in 4 faculties of UNAM of Mexico and 4 faculties of the SNU in South Korea, 50 for each faculty (25 men and 25 women). The format was done by obtaining an ideal and through a software sagittal and vertical modifications for different profiles and thirds, were conducted in Spanish and Korean. **Results:** There were no statistically significant differences in gender and nationality. The favorite male profile was concave and the favorite female profile was convex, both with significant statistical difference by occupation ( $\chi^2 = 19.505$   $p = 0.003$ ) ( $\chi^2 = 32.742$   $p < 0.001$ ). **Conclusions:** The preferred facial profile was concave in men and convex in women. The worst facial profile was convex in men and concave in women. The favorite lower facial third was proportionate and the least liked was a diminished lower third. There were no differences between nationalities or gender, but by professions.

**Key words:** Preference, facial profile, lower third facial proportions, facial analysis.

**Palabras clave:** Preferencia, perfil facial, tercio inferior, proporciones faciales, análisis facial.

#### RESUMEN

**Objetivo:** Evaluar la preferencia respecto al perfil facial entre una comunidad de jóvenes estudiantes en Corea del Sur y México durante el 2012. **Material y métodos:** 400 encuestas se aplicaron en cuatro facultades de la UNAM de México y en cuatro facultades de la SNU de Corea del Sur; 50 personas por cada facultad (25 hombres y 25 mujeres). El formato se realizó mediante la obtención de un ideal, y a través de un software se modificó en sentido vertical y sagital para obtener diferentes perfiles y tercios, se realizaron en español y en coreano. **Resultados:** No hubo diferencias estadísticas significativas en cuanto al sexo y nacionalidad. El perfil masculino favorito fue el cóncavo y en el femenino fue el convexo, ambos con diferencias estadísticas significativas por profesiones ( $\chi^2 = 19.505$   $p = 0.003$ ) ( $\chi^2 = 32.742$   $p < 0.001$ ). **Conclusiones:** El perfil facial preferido fue el cóncavo en hombres y el convexo en mujeres. El perfil facial que menos gustó es el convexo en hombres y el cóncavo en mujeres. El tercio inferior preferido fue el proporcionado y el que menos agradó fue el tercio inferior disminuido. No hubo diferencias entre nacionalidades ni sexo, pero sí por profesiones.

#### INTRODUCTION

The human face is probably the most beautiful structure of creation. The concept of beauty appears to be universal, its appreciation out of the cognitive area of the brain, but there are variations imposed by fashion and by different cultures through time. In the modern world these possibilities widen due to the fact that the media has displayed ideal models of facial esthetics all over the world.<sup>1</sup> Our perception of the form, profile shape of things and morphological physical dimension as well as their acceptance or esthetic rejection depends on the concept that we have acquired of them, always being conditioned by cultural, social, academic and scientific influence. Thus stereotypes are born, ideal representative models that are accepted, discussed or rejected by everyone and that can be used to judge facial beauty. Humans have not always thought similarly about beauty and not only

because nowadays beauty patterns are different but also because evolutionary changes of the international cultural exchange intervene.

Facial esthetics from Greek sculptures captured the attention of many of the first orthodontists. Angle, who considered Apollo Belvedere and the Venus from Milo as paragons of facial beauty, was deeply interested in the facial art from the Washington School of Fine Arts art teacher, E.H. Wuerpel. He considered that beauty is in the eye of the beholder who in turn is influenced by race, color, culture and formation.<sup>2</sup>

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Renaissance esthetics mostly used architecture concepts. Renaissance sculptors scarcely focused on the classic themes but when sculpting David or Mary Magdalene they shaped them according to the shapes, proportions or postures of the antique Greek gods. Renaissance artists not only learned to copy antique columns or human figures they also knew that they had certain proportions that they are subject to canons and that they are a matter of calculus and knowledge. The link between art and math was a natural phenomenon in a time when the Platonic and the Pitagoric tradition had already been assumed, nonetheless, la equal relationship between art and science was a new idea even under the light of old concepts.<sup>3</sup>

Leonardo da Vinci showed the projection of a coordinate or coordinate system in the face. Albrecht Dürer used a coordinate system to demonstrate differences in length and showed that the proclination of the facial contour differs from the retroclined due to a change in the angle between the vertical and the horizontal axis of its coordinate system.<sup>4</sup>

And so the contemporary era begins, whereas today the continuous search of universal human perfection persists. The perception of beauty is multifactorial with genetic, environmental and cultural components.<sup>5</sup> At first it was believed that the perception of beauty relied on the perception of each individual. Nowadays, this myth has been set straight by scientists who have proved the basis of perception in the brain through the application of a series of factors such as symmetry or the golden proportion. Korea is a world innovator in the perception of international beauty combining the best of their culture and physical features with the western concepts of beauty and thus creating a new and at the same time traditional beauty prototype.<sup>6</sup> In Mexico, the imposition of a beauty canon has been molded according to fashion and different eras with great variety.<sup>7</sup> The objective of this study was to assess the preference regarding the facial profile among a community of young students in South Korea and Mexico during 2012.

## MATERIAL AND METHODS

The present is a cross-sectional study. Survey formats were made and were applied only to the Dental, Architecture, and Engineering Schools and to the National School of Plastic Arts at the National University of Mexico (UNAM) and to the Schools of Dentistry, Architecture, Engineering and Art of the National University of Seoul (SNU).

The inclusion criteria were students from those schools, born in Mexico or South Korea and ages between 18 to 30 years old. Exclusion criteria were those students who did not wish to participate in the survey, Mexicans living in South Korea and viceversa as well as students from other schools.

### Sample size and selection

Sample size was 392 subjects and it was calculated according to the proportions formula under the following assumptions:

Confidence: 0.95  
 Level of significance: 0.05  
 $Z = 1.96$   
 Estimate case proportion: 80%  
 Variance: 0.16  
 Accuracy: 4%

Sample selection was made by element availability.

### Survey form

A survey form was shown to both groups. The survey form was made as follows:

An image search was made on magazines, books and web pages to select a man and a woman that had the most convenient esthetic points for this study. Profile modifications were made with a software (FaceGen Modeller 3.2) to the obtained images in order to achieve the following:

- In the female image, anteroposterior changes were made to increase or decrease the facial profile by millimeters thus obtaining the following profiles:
  - a) Straight profile: 0 mm.
  - b) Convex profile: decreased by 3.06 mm.
  - c) Concave profile: increased by 3.06 mm.
- In the male profile anteroposterior modifications were made to increase or decrease by millimeters the facial profile thus obtaining the following profiles:
  - a) Straight profile: 0 mm.
  - b) Convex profile: decreased by 3.06 mm.
  - c) Concave profile: increased by 3.06 mm.
- In the female profile, longitudinal modifications were made on the lower facial third to increase or

decrease by millimeters the profile thus obtaining the following profiles:

- a) Straight facial profile with a proportionate lower third.
  - b) Facial profile with a diminished lower third: it was reduced 5.01 mm.
  - c) Facial profile with an increase in the lower third: it increased -5.01 mm.
- In the male image, longitudinal modifications were made on the facial lower third in order to increase or decrease in millimeters the profile thus obtaining the following profiles:
    - a) Proportionate facial profile: 0 mm.
    - b) Facial profile with a decreased lower third: it was reduced 5.01 mm.
    - c) Facial profile with an increased lower third: it was increased -5.01 mm (*Figure 1*).

The results of such deviations were:

- a) Three female images one with a straight profile, one with a convex profile and one with a concave profile.
- b) Three male images: one with a straight profile, one with a convex profile and one with a concave profile.
- c) Three images of a female profile, one with a proportionate lower third, one with a decreased

lower third and one with an increased lower third.

- d) Three images of a male profile, one with a proportionate lower third, one with a decreased lower third and one with an increased lower third (*Figure 2*).

With the obtained images two blocks of three images from the facial profile were placed on a sheet of paper and divided into male-female. On a second sheet of paper two other blocks of three images of the lower third each and were divided into male-female. Once the form was assessed and approved by the investigators a translation to corean was made with aid from a native South Corean student at UNAM who is also a Corean teacher.

**Data collection**

Since this research was carried out in different countries the sample collection for this study was carried out as follows:

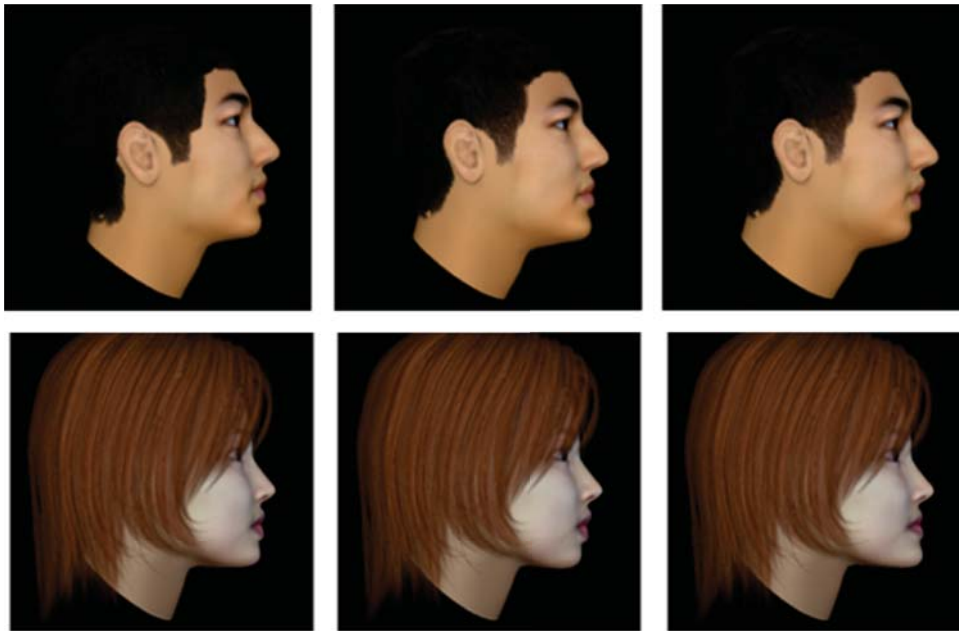
In Mexico, the investigators went to the four campi of the abovementioned schools and asked if the students had time to answer the survey. No special permissions were needed to enter those schools.

In South Corea, Mexican students at the National University of Seoul were contacted to know if a special document or permission was needed to enter the University and perform the surveys. They declared that



**Figure 1.**

Facial profile images modified at the lower third by a software to obtain dolichofacial, proportionate and brachifacial profiles.



**Figure 2.**

Facial profile images modified at the facial lower third by a software to obtain a straight, concave and a convex profile.

it is an open access university and therefore no special document or permission was needed. The same students were used as translators once the surveys were conducted in South Korea. Likewise, the main investigator learned Korean for better communication. Sample collection was performed exactly like the one in Mexico.

A database in DBase V was made for the research and there results were analyzed using the 13.0 version of the SPSS program. A descriptive analysis was carried out for sociodemographic variables such as sex and age. To verify the association between facial profile preference and lower third with gender and school, an  $\chi^2$  bivariate statistical analysis was performed.

## RESULTS

Among the obtained results it was observed that in the male facial profile type, the concave was the one preferred by Mexicans (62%) and by Koreans (60%). There was no statistically significant difference by nationality in the male facial profile preference ( $\chi^2 = 3.818$   $p = 0.148$ ).

In terms of gender, a statistically significant difference was observed in the preference of the male facial profile ( $\chi^2 = 9.614$   $p = 0.008$  67% women 54.5% men). By profession, the concave profile was selected preferably by 61% (73% architecture, 60% arts, 59% engineering and 52% dentistry). A statistically significant difference was observed in relation to the

male profile preference by professions ( $\chi^2 = 19.505$   $p = 0.003$ ) (Figure 3).

The kind of male facial profile that was less pleasing was the convex with 88% of the Mexicans and 83.5% of the Koreans. There was no statistically significant difference ( $\chi^2 = 2.407$   $p = 0.300$ ).

In relation to gender, 91% of women chose the convex profile and the men elected it by 80.5% being 85.8% in general. A statistically significant difference was observed in the least pleasing type of male facial profile by gender ( $\chi^2 = 12.419$   $p = 0.002$ ).

By profession, the convex profile was selected preferably with a 85.8% in total (91% architecture, 88% arts, 84% engineering and 80% dentistry). No statistically significant difference was observed regarding the least pleasing type of male facial profile by professions ( $\chi^2 = 12.187$   $p = 0.058$ ) (Figure 4).

With regard to the female facial profile the convex was preferred by Mexicans by 57% and 67% by Koreans. A statistically significant difference was observed in the preference of the female facial profile by nationality ( $\chi^2 = 7.832$   $p = 0.020$ ). In terms of gender, 61.5% of women chose the convex profile and the men chose it by 62.5% being 62% in general. There was no statistically significant difference in the preference of the female facial profile by gender ( $\chi^2 = 0.166$   $p = 0.920$ ).

By profession, the convex profile was selected preferably with a 62% in total (77% dentistry, 65% arts, 61% engineering and 45% architecture). A statistically significant difference was observed regarding the

preference of the female profile by professions ( $\chi^2 = 32.742$   $p < 0.001$ ) (Figure 5).

The least pleasing kind of female facial profile for the Mexicans was the concave with a 64% and 47% of Koreans. A statistically significant difference was observed in the least pleasing type of female facial profile by nationality ( $\chi^2 = 25.123$   $p < 0.001$ ). In terms of gender, 55% of women chose the concave profile and the men chose it by 56%, being a 55.5% in general. There was no statistically significant difference by gender in the type of female facial profile that least pleased ( $\chi^2 = 0.792$   $p = 0.673$ ).

By profession, the preferably selected profile was concave with a 55.5% in total (68% dentistry, 62% arts, 53% engineering and 39% architecture). There was statistically significant difference in relation to the least

pleasing kind of female facial profile by professions ( $\chi^2 = 30.442$   $p < 0.001$ ) (Figure 6).

The male lower facial third preferred by Mexicans was the proportionate one with a 59.5% and a 69% by the Koreans. A statistically significant difference was observed in the preferred male lower facial third by nationality ( $\chi^2 = 13.177$   $p = 0.001$ ) (Figure 7).

Regarding gender, 68% of the women chose a proportionate lower third and the men chose it by 60.5%, being 64.5% in general.

There was no statistically significant difference in the preference of the lower third male by gender ( $\chi^2 = 2.675$   $p = 0.262$ ). By profession, the proportionate lower third was selected preferably with a 64.3% in total (71% dentistry, 66% engineering, 61% arts and 59% architecture). There was no statistically significant difference with regard to the preference of the lower third male by professions ( $\chi^2 = 6.077$   $p = 0.415$ ).

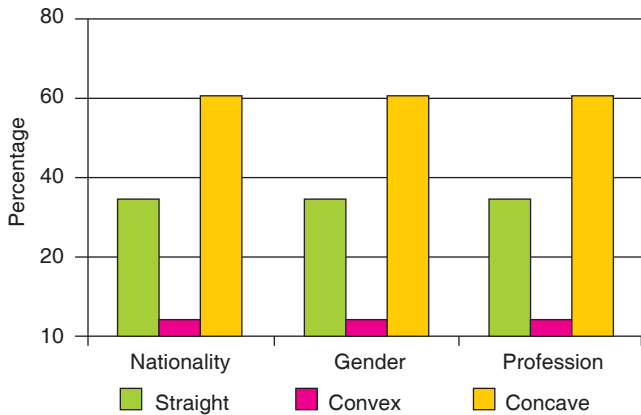


Figure 3. Kind of male facial profile.



Figure 4. Least pleasing male facial profile.

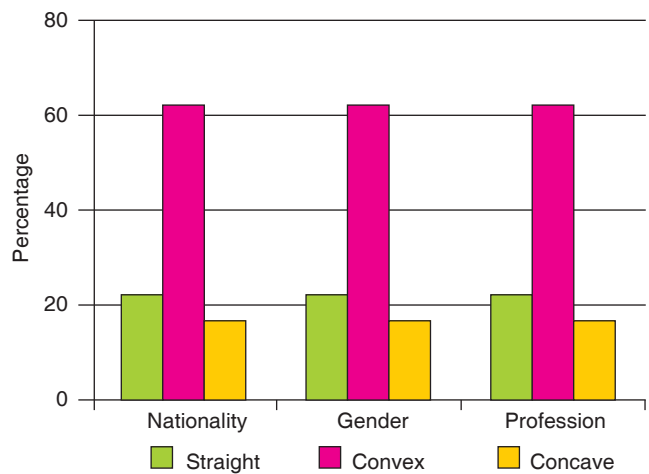


Figure 5. Kind of female facial profile.

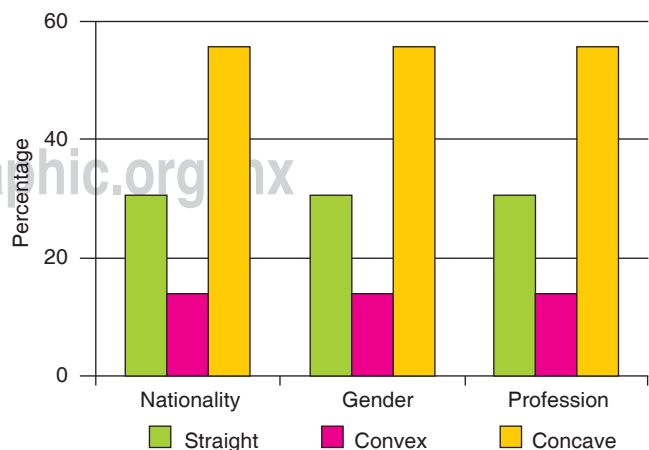


Figure 6. Least pleasing female facial profile.



The male lower facial third that was least pleasing to the Mexicans was the brachifacial by 45.5% and 61% by the Koreans.

A statistically significant difference was observed in the selection of the least pleasing male lower facial third by nationality ( $\chi^2 = 10.539$   $p = 0.005$ ). In terms of gender 51.5% of women and 55% of men chose the brachifacial lower third, being 53.3% in general. There was no statistically significant difference in the least preferred male lower third by gender ( $\chi^2 = 4.126$   $p = 0.127$ ). By professions, the brachifacial lower third was selected preferably with 53.3% in total (58% engineering, 53% architecture, 52% dentistry and 50% arts). There was no statistically significant difference regarding the preference of the least pleasing male lower third by professions ( $\chi^2 = 8.139$   $p = 0.228$ ) (Figure 8).

The female lower facial third preferred by Mexicans was the proportionate one with a 82.5% and 64.5% of the Koreans. The next lower third selected was the dolichofacial with an overall 23.3% (15% of Mexicans and 31.5% of the Koreans). A statistically significant difference was observed in the preferred female lower facial third by nationality ( $\chi^2 = 16.810$   $p < .001$ ). In terms of gender 76% of women chose the proportionate lower third and the men selected it by a 71% being a 73.5% in general. The second lower third elected was the dolichofacial with 23.3% in total (21.5% for women and 25% of men). There was no statistically significant difference in the preference of the male lower third by gender ( $\chi^2 = 1.559$   $p = 0.459$ ). By profession, the proportionate lower third was selected preferably with

a 73.5% in total (81% architecture, 80% arts, 76% engineering and 57% dentistry). The next selected lower third was the dolichofacial with an overall 23.3% (40% dentistry, 19% architecture, 17% arts and 17% engineering). A statistically significant difference was observed regarding the preference of the male lower facial third by profession ( $\chi^2 = 28.949$   $p < 0.001$ ).

The female lower facial third that was least pleasing to the Mexicans was the brachifacial with a 83.5% and 88.5% for the Koreans. The next selected lower third was the dolichofacial with an overall 11% (13.5% of the Mexicans and 8.5% of the Koreans). There was no statistically significant difference in the preference of the least pleasing female facial lower third by nationality ( $\chi^2 = 2.563$   $p = 0.278$ ). In relation to the gender 88% of women chose the brachifacial lower third and the men selected it by 84% still being an overall 86%. The second lower third that was elected was the dolichofacial with 11% in total (10 per cent for women and 12% of men). There was no statistically significant difference in the preference of the least pleasing lower third female by gender ( $\chi^2 = 1.883$   $p = 0.390$ ). By professions, the brachifacial lower third was selected preferably with a 86% in total (96% dentistry, 87% architecture, 82% engineering and 79% arts). The next selected lower third was the dolichofacial with an overall 11% (16% arts, 13% engineering, 11% architecture and 4% dentistry). A statistically significant difference was observed with regard to the preference of the least pleasing female lower third by professions ( $\chi^2 = 15.021$   $p = 0.020$ ) (Figure 9).

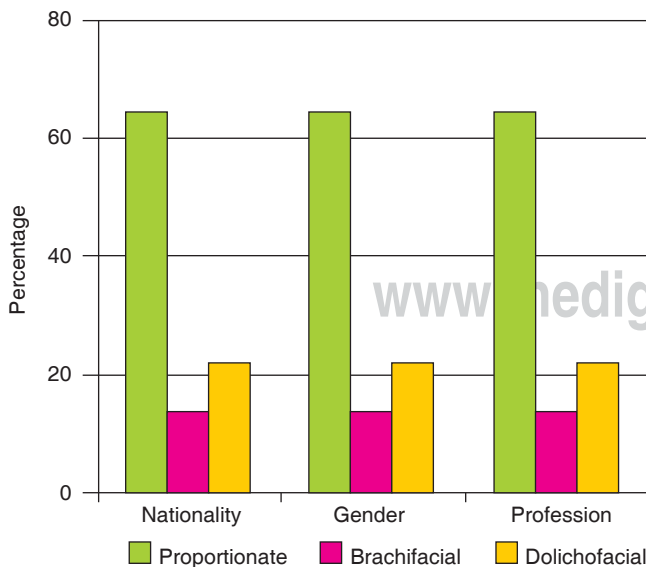


Figure 7. Preferred male lower facial third.

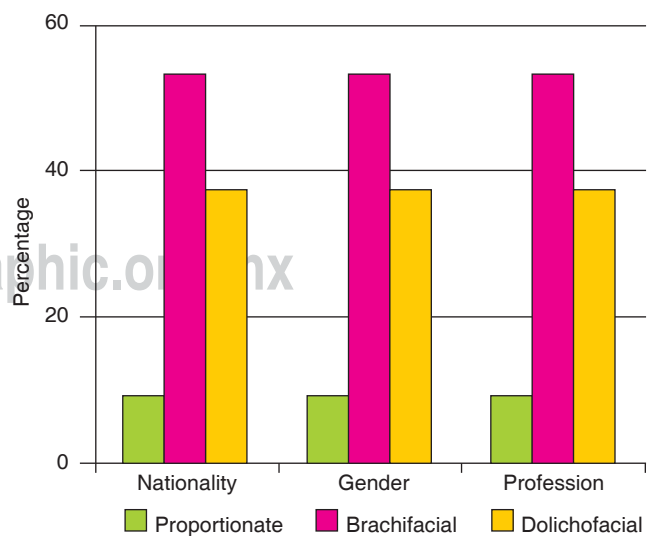


Figure 8. Least pleasing male lower third.

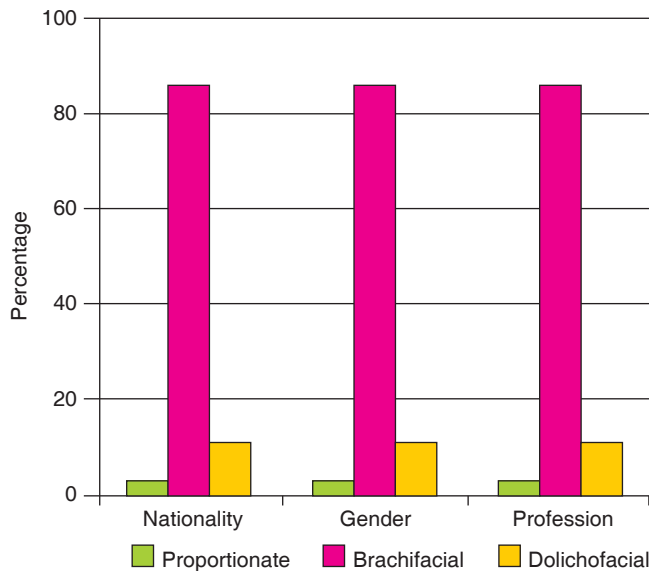


Figure 9. Least pleasing female lower third.

## DISCUSSION

By obtaining the differences in relation to the profiles established as international standards, one could say that despite the differences between the two countries the same aesthetic point of view may be achieved and thus establish beauty canons more according to our facial features in comparison with the Caucasian standards.

As in the study conducted by Yan Liu and Co.<sup>8</sup> in which differences in the choice of the aesthetic appreciation among Americans and the Chinese orthodontists could not be demonstrated, our study supports their results and reinforces it since it was not carried out with orthodontists only but in addition three more professions were added and they agreed with slight differences in an average of aesthetic appreciation.

In our study's results a preference for convex profiles in females was observed thus supporting the results of the study made by Shingo Koruda et al<sup>9</sup> in 2009 in a Japanese population. However, in this study, the convex profile was also chosen for the male face while in our study the concave profile was chosen. It might be that the Japanese chose the convex profile because it is the facial profile tendency in their population. Likewise the difference might have been that in their study the photographs were shown to the general population that could made their selection according to what is most common. Perhaps if we had led this investigation to a different population that

had not had contact with beauty canons, the results might have been different, however, in both studies a different profile was chosen over the one established by artists and sculptors.

Another study that confirms the abovementioned statement is the one performed by Mejia-Maidi et al<sup>10</sup> which refers to the preference for more protrusive lips in women than in men.

In spite of the fact that the four professions chosen for this article have the study of the golden proportions as a basis and knowledge about beauty, they showed differences in their elections, as well as complications in the application of this knowledge to assess the face. However further research would have to be performed to explain why despite it was difficult, the participants used these principles as a guide for selection and not simple taste, i.e. showing that beauty does not depend on whether who looks at it, but rather if you have a basis about proportions.

The perception of beauty can be variable according to the era and mass media<sup>11</sup> which opens new horizons and breaks barriers in the coexistence of people by altering our perception and sense of aesthetic appreciation. This could be the reason why yesterday's beauty canons cannot be so rigid, there must be a reassessment on how the new generation develops a predilection of something beautiful.

This research tried to keep the least degree of bias so that it could be as reliable as possible, however, despite the investigator's efforts, it would have been better to carry out the research with the help of some Korean student at the University of Seoul, since the language barrier was challenging.

## CONCLUSIONS

The conclusions of our study were the following:

1. The preferred male facial profile was the concave facial profile contrary to straight.
2. The preferred female facial profile was the convex contrary to the straight profile.
3. The least preferred male profile was the convex profile and the least liked female profile was the concave.
4. The predilection for the lower third of the face was the proportionate one for both male and female there was no difference to what has been established in the literature.
5. The brachifacial lower third was chosen as the least pleasant.

In the present study there were no differences by nationality neither was there a difference in regard to the gender of the participants. However, there were many discrepancies between architecture and Dentistry in relation to the aesthetic appreciation. It also might have been expected that Arts had a better appreciation due to their close relationship with beauty canons.

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