# Mesiodistal Crown Dimensions in Mexico and The United States

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**Measurement of crown width of the teeth from first molar to first molar in population samples from Northern Mexico and North Central United States finds only small differences that would be of little importance in orthodontic diagnosis.**

KEY WORDS: • DENTITION • ETHNIC GROUPS • MEXICO • TOOTH SIZE •

The close geographic, economic and scientific ties between Mexico and the United States have led to numerous exchanges between the two countries in the spheres of culture, science and populace. Dental sciences and technologies have been an integral part of these exchanges, and many practitioners in Latin America and the USA have adopted similar diagnostic approaches. These include the use of cephalometric analyses and methods for predicting the mesiodistal crown diameter of unerupted permanent teeth in the mixed dentition.

In a symposium on genetics, BAILIT (1975) stated, "the seemingly minor differences in dental traits among and within populations can be of great interest and importance to both anthropologists and practicing dentists. For anthropologists, these differences reflect the ongoing process of evolution and provide a method for studying evolutionary mechanics. For dentists these differences represent the variation that must be considered in the daily care of patients."

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Such differences could have important effects in the application of diagnostic criteria derived from specific populations, as in prediction equations used to estimate mesiodistal crown dimensions of unerupted permanent teeth.

This study compares crown width in the the permanent dentition of study samples drawn from Mexican and United States populations.

## — Literature —

BLACK (1902), WHEELER (1961), AND BALLARD (1944) were among the first to measure tooth dimensions in North American whites. GRIEWE (1949) also measured the mesiodistal width in individuals with different types of malocclusions.

There is considerable variation in tooth size, age at eruption, congenitally missing teeth, and crown morphology among and within populations. According to BAILIT (1975), these differences are a reflection of the ongoing processes of evolution. The genetic basis for variation is best explained by a polygenic model of inheritance.

Postnatal conditions seem to have little influence on most "normal" dental variations. LUNDSTRÖM (1964) compared 97 pairs of like-sexed monozygotic and dizygotic twins and found a stronger correlation in mesiodistal tooth dimension between monozygotic twins. He concluded that tooth size is determined to a large extent by genetic factors.

The genetic pool in the Mexican population can be assumed to be mainly an admixture of Spanish (Caucasian) and North American Indian (Mongolian) descendants. Differences between Caucasian and Amerindian tooth dimensions have been observed by a number of investigators.

DAHLBERG (1951, 1963) described the dentition of people of Mongoloid stock as having shovel-shaped incisors with prominent marginal ridges and cingulum, with their mesiodistal diameter close to that of American Caucasians. He found the size of the bicuspids to be relatively smaller in the North American Indians. NELSON (1938) compared the mesiodistal diameters of teeth of the Pecos Pueblo Indians and found the teeth to be larger than the values reported by G. V. Black.

MOORREES (1957) measured the dentition of Alaskan Aleuts and compared them to North American Caucasians. He found that the teeth from first molar to first molar are slightly larger in the Aleuts, with relatively smaller differences in the size of the central and lateral incisors. Male Aleuts have larger teeth than females, with the difference most pronounced in the mandibular cuspids.

KELLAM (1982) compared tooth measurements of 40 Navajo Indians from Shiprock, New Mexico to those of 40 Caucasian patients from the Orthodontic department at the University of Iowa. He found the sum as well as the individual tooth diameters to be greater in Navajos than in Caucasians. In addition, both groups exhibited sex differences in the size of maxillary and mandibular cuspids, with males having larger teeth than females.

A number of studies have been conducted on Amerindians from Mexico. BAUME AND CRAWFORD (1978) compared 700 dental casts from four Tlaxcaltecan Indian populations of Mexico and found significant morphological divergence among these populations. Interestingly, these populations are all of related genetic background.

O'ROURKE AND CRAWFORD (1980) documented odontometric variations in the same populations. They found that the transplanted populations of Cuanalan and Saltillo have undergone significant microdifferentiation in tooth size relative to the two home valley populations of San Pablo and Tlaxcala. They also noted

a markedly smaller tooth size in groups that had experienced more European admixture. They concluded that the extent and direction of this microdifferentiation is a reflection of differential amounts of genetic mixture.

Various degrees of admixture between Amerindians, Spanish and possibly African colonists have resulted in a new genetic pool that should be investigated.

In such populations, the determination of the influence of separate parental gene pools might not be simple. Population divergence has been clouded not only by historical and demographic factors, but also by evolutionary ones such as gene flow (Baume 1978).

Bailit (1975) emphasized that the terms European, Amerindian, African, etc. can be misleading, since each represents a varied population with probably large differences in tooth size among subgroups.

From an orthodontic point of view, it is important to determine the dental traits, as well as the dentofacial relationships that may have resulted from these admixtures.

There is a notable absence of tooth size standards for admixed Mexicans in large metropolitan areas where there is a relatively large demand for orthodontic treatment. Standards that are specifically relevant to the practicing dentist and orthodontist should be developed for application both in Mexico and in many areas of the United States.

### *Objectives of this Study*

1. Obtain normative data on the mesiodistal crown dimensions in males and females in two populations, one derived from individuals enrolled in the Iowa Facial Growth Study and the other from North Mexican children enrolled in the school system of Chihuahua, Mexico.

2. Determine whether sex differences exist in the size of the teeth within the two populations examined.

3. Determine whether significant differences exist between the two populations in the mesiodistal crown dimensions of the permanent teeth from first molar to first molar inclusive. Individual teeth as well as sums of groups of teeth will be compared.

## — Materials and Methods —

The criteria for selecting the subjects and the dental casts were:

- A full complement of permanent incisors, cuspids, bicuspids, and first molars on both sides of the maxillary and mandibular dental arches.
- All teeth assessed to be morphologically normal; any casts showing gross dental abnormalities were rejected.
- Casts with apparent loss of tooth substance due to attrition, caries, or restorations which affected the mesiodistal diameter of the crown were rejected.
- Normal anteroposterior (angle Class I) molar and cuspid relationships with little or no incisor crowding.
- Acceptable facial relationships with no apparent skeletal discrepancies in the face.
- No history of previous orthodontic treatment or serious health problems.

### *The North Mexican Sample —*

The subjects for this study were selected with the assistance of the Dental School Administration at the University of Chihuahua. Approximately 700 boys and girls in two junior high schools in Chihuahua, Mexico were examined. Geo-

graphically, one school is located in the northeast and the other in the southwest parts of the city.

The number of Mexican individuals who met the selection criteria were 26 males and 34 females. The mean age for the males was 12.5 years, and for the females 12.9 years.

The family lineage of the sample group indicated that at least four generations had resided in the Northern states of the Mexican Republic.

The socioeconomic background of the individuals in the sample is varied; approximately ⅓ of the subjects have parents in the professional fields, and the remaining ⅔ are from commercial or skilled trade families.

*The Iowa Sample —*

Dental casts of 57 Caucasian subjects were selected from files of the Iowa Facial Growth Study, using the same criteria described above. All subjects were voluntary participants in a long-term research program begun in 1946 by Drs. Howard V. Meredith and L. B. Higley.

The mean age of the 35 male subjects was 13.8 years, and for the 22 females it was 14.2 years.

The Iowa subjects were American born White children of predominantly Northwest European ancestry. All lived in or around Iowa City, with approximately half from families in the professional field and the other half from administrative, commercial or skilled trade families.

### *Measurement Technique*

The dental casts measured in this investigation had not been treated with soap or otherwise polished.

The measurement of the mesiodistal tooth dimensions used procedures described by HUNTER AND PRIEST (1960). The greatest mesiodistal diameter from anatomic mesial contact point to anatomic distal contact point of each tooth was measured parallel to the occlusal plane. All measurements were recorded to the nearest 0.10mm, using pointed calipers.

Two investigators independently recorded two measurements for each tooth. Intra- and interexaminer reliability were previously determined to be within 0.2mm. When discrepancies greater than this limit occurred, a new set of measurements were made and the nearest three measurements averaged.

The question of the accuracy of plaster casts fabricated from alginate impressions as a representation of actual tooth size was investigated by HUNTER AND PRIEST (1960). They concluded that there is a considerable advantage to measuring teeth on dental casts rather than measuring directly in the mouth.

All teeth are numbered according to the International dental numbering System, with Universal numbers in parentheses (Figure 1).

### *Statistical Analysis*

The mean, standard deviation, minimum and maximum values were computed for each tooth, as well as for the sums of the following groups of teeth:

- Mandibular central and lateral incisors on each side
- All four mandibular incisors
- Cuspid, first bicuspid and second bicuspid in each quadrant.

These sums are used in tooth-size prediction equations along with individual tooth dimensions.

The analysis of variance general linear model procedure was performed to compare the Mexican and Iowa groups and the males and females within each group. F values were calculated, and if signifi-

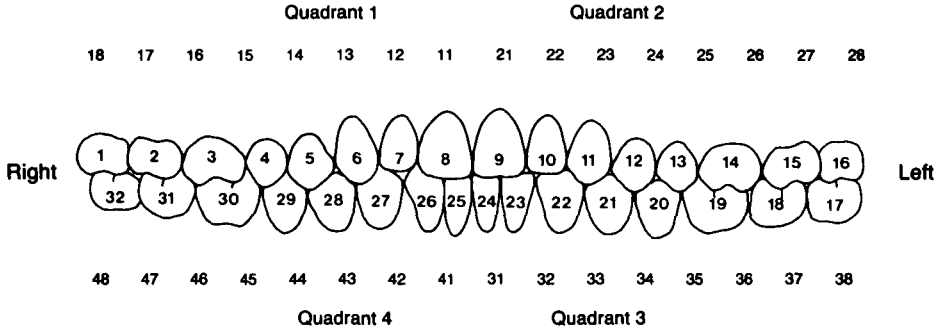


**Fig. 1 Tooth numbers according to the International** *(above and below)* and Universal *(inside teeth)* dental numbering systems.

cant at $P \leq 0.05$ the Duncan's multiple range test was performed to compare the means of the groups.

## — Findings —

Descriptive statistics on the mesiodistal tooth dimensions of Iowa males, Iowa females, North Mexican males and North Mexican females are presented in Table 1.

### *Right/Left Comparisons*

Paired t-tests were used to compare corresponding teeth on opposite sides of the arch. Of the 80 comparisons within the four subgroups, the mean width of only nine antimeres were significantly different from each other.

For Iowa Males, these pairs were;

16*(3)* - 26*(14)*
34*(21)* - 44*(28)*

For Iowa Females

12*(7)* - 22*(10)*
36*(19)* - 46*(30)*
32*(23)* - 42*(26)*

For Mexican Males

14*(5)* - 24*(12)*
35*(20)* - 45*(29)*

For Mexican Females;

13*(6)* - 23*(11)*
32*(23)* - 42*(26)*

Mean differences between any two antimeres ranged from $0 \pm 0.09$mm to $0.24\text{mm} \pm 0.29\text{mm}$. These differences are very small in magnitude and are not clinically significant.

### *Male/Female comparisons*

Iowa — Cuspids and first molars were significantly larger in males than in females. No significant differences were found between the incisors. Significant differences were found in a number of comparisons between bicuspids, but these did not follow a consistent pattern.

Northern Mexico — Cuspids, first bicuspids, second bicuspids and first molars were significantly larger in males than in females. There were no significant differences between incisors.

### *Iowa/Northern Mexican Comparisons*

Of the total of 40 tooth comparisons between the two populations, only 15*(4)* and 35*(20)* in males, and 11*(8)* in females, were significantly larger in the North Mexican population ($P \leq 0.05$).

Table 1

Mesiodistal Tooth Dimensions of Iowa and North Mexican Subjects with Normal Occlusion

Iowa Males N = 35
Iowa Females N = 22
Mexican Males N = 26
Mexican Females N = 34

| | | Iowa Sample | | | | North Mexican Sample | | |
|---|---|---|---|---|---|---|---|---|
| Tooth | Sex | Min | Mean ± SD | Max | Sig Diff. | Min | Mean ± SD | Max |
| | | | Maxillary teeth | | | | | |
| *Molars* | | | | | | | | |
| 16(3) | ♂ | 8.92 | 10.44 ± 0.57 | 11.55 ↑ | | 9.60 | 10.54 ± 0.50 | 11.70 |
| | ♀ | 9.30 | 10.08 ± 0.47 | 11.28 ↓ | | 8.90 | 10.23 ± 0.73 | 12.20 |
| 26(14) | ♂ | 9.35 | 10.35 ± 0.43 | 11.18 ↑ | | ↑ 9.30 | 10.59 ± 0.53 | 11.40 |
| | ♀ | 9.00 | 10.00 ± 0.42 | 11.08 ↓ | | ↓ 9.20 | 10.26 ± 0.63 | 11.50 |
| *Bicuspids* | | | | | | | | |
| 15(4) | ♂ | 5.80 | 6.66 ± 0.41 | 7.35 | ←→ | ↑ 6.00 | 6.97 ± 0.48 | 8.20 |
| | ♀ | 6.00 | 6.51 ± 0.35 | 7.48 | | ↓ 5.90 | 6.64 ± 0.04 | 7.80 |
| 25(13) | ♂ | 5.80 | 6.72 ± 0.44 | 7.67 ↑ | | ↑ 6.30 | 6.85 ± 0.42 | 7.80 |
| | ♀ | 6.00 | 6.50 ± 0.31 | 7.20 ↓ | | ↓ 5.70 | 6.60 ± 0.44 | 7.70 |
| 14(5) | ♂ | 6.08 | 6.93 ± 0.39 | 7.72 | | ↑ 6.30 | 6.94 ± 0.30 | 7.50 |
| | ♀ | 6.12 | 6.72 ± 0.36 | 7.38 | | ↓ 5.60 | 6.63 ± 0.35 | 7.30 |
| 24(12) | ♂ | 6.02 | 6.95 ± 0.42 | 7.82 | | ↑ 5.80 | 7.06 ± 0.45 | 7.80 |
| | ♀ | 6.18 | 6.77 ± 0.41 | 7.78 | | ↓ 5.70 | 6.65 ± 0.34 | 7.40 |
| *Cuspids* | | | | | | | | |
| 13(6) | ♂ | 6.82 | 7.82 ± 0.46 | 8.90 ↑ | | ↑ 6.00 | 7.94 ± 0.55 | 8.90 |
| | ♀ | 7.00 | 7.49 ± 0.35 | 8.30 ↓ | | ↓ 6.40 | 7.56 ± 0.48 | 8.40 |
| 23(11) | ♂ | 6.45 | 7.82 ± 0.48 | 8.65 ↑ | | ↑ 6.40 | 7.96 ± 0.51 | 8.70 |
| | ♀ | 6.90 | 7.43 ± 0.35 | 8.25 ↓ | | ↓ 5.60 | 7.31 ± 0.51 | 8.00 |
| *Incisors* | | | | | | | | |
| 12(7) | ♂ | 5.78 | 6.72 ± 0.46 | 7.58 | | 4.70 | 6.55 ± 0.58 | 7.60 |
| | ♀ | 5.28 | 6.58 ± 0.58 | 7.68 | | 5.00 | 6.52 ± 0.62 | 7.60 |
| 22(10) | ♂ | 5.75 | 6.67 ± 0.43 | 7.40 | | 4.20 | 6.60 ± 0.65 | 7.60 |
| | ♀ | 5.40 | 6.43 ± 0.51 | 7.68 | | 4.80 | 6.47 ± 0.67 | 7.40 |
| 11(8) | ♂ | 7.78 | 8.61 ± 0.51 | 9.28 | | 7.00 | 8.45 ± 0.61 | 9.90 |
| | ♀ | 7.78 | 8.61 ± 0.51 | 9.28 | ←→ | 6.80 | 8.15 ± 0.54 | 8.90 |
| 21(9) | ♂ | 7.78 | 8.61 ± 0.51 | 9.40 | | 7.10 | 8.42 ± 0.59 | 9.90 |
| | ♀ | 7.78 | 8.61 ± 0.51 | 9.40 | | 6.70 | 8.20 ± 0.52 | 8.90 |
| *Sums of selected maxillary teeth* | | | | | | | | |
| Σ 13 + 14 + 15 | ♂ | 18.90 | 21.41 ± 1.03 | 23.42 | | 8.90 | 21.85 ± 1.08 | 23.90 |
| Σ 13 + 14 + 15 | ♀ | 19.50 | 20.73 ± 0.96 | 23.15 | | 8.60 | 20.83 ± 0.94 | 23.00 |
| Σ 23 + 24 + 25 | ♂ | 18.92 | 21.55 ± 1.08 | 23.77 | | 9.70 | 21.88 ± 1.00 | 23.70 |
| Σ 23 + 24 + 25 | ♀ | 19.38 | 20.70 ± 0.92 | 22.88 | | 8.30 | 20.56 ± 1.05 | 22.70 |

| Tooth | Sex | Iowa Sample Min | Mean ± SD | Max | Sig Diff | North Mexican Sample Min | Mean ± SD | Max |
|---|---|---|---|---|---|---|---|---|
| **Mandibular Teeth** | | | | | | | | |
| *Molars* | | | | | | | | |
| 36(19) | ♂ | 9.22 | 10.99 ± 0.67 | 12.10 | | 9.60 | 10.87 ± 0.57 | 12.00 |
| | ♀ | 9.62 | 10.64 ± 0.57 | 11.75 | | 9.60 | 10.61 ± 0.51 | 11.80 |
| 46(30) | ♂ | 9.20 | 10.96 ± 0.34 | 12.15 ↑ | | ↑ 9.90 | 10.90 ± 0.55 | 11.90 |
| | ♀ | 9.80 | 10.45 ± 0.55 | 11.50 ↓ | | ↓ 9.10 | 10.48 ± 0.52 | 11.80 |
| *Bicuspids* | | | | | | | | |
| 35(20) | ♂ | 6.35 | 7.11 ± 0.46 | 8.18 | ← → | ↑ 6.80 | 7.39 ± 0.45 | 8.60 |
| | ♀ | 6.30 | 6.91 ± 0.38 | 7.75 | | ↓ 6.00 | 7.00 ± 0.47 | 8.10 |
| 45(29) | ♂ | 6.15 | 7.05 ± 0.41 | 7.82 ↑ | | ↑ 6.70 | 7.27 ± 0.41 | 8.20 |
| | ♀ | 6.40 | 6.82 ± 0.30 | 7.60 ↓ | | ↓ 5.80 | 6.95 ± 0.55 | 8.30 |
| 34(21) | ♂ | 6.08 | 6.97 ± 0.38 | 7.92 | | ↑ 6.20 | 7.05 ± 0.45 | 8.00 |
| | ♀ | 6.48 | 6.83 ± 0.36 | 7.72 | | ↓ 5.50 | 6.73 ± 0.48 | 8.00 |
| 44(28) | ♂ | 5.72 | 6.90 ± 0.42 | 7.82 | | ↑ 6.40 | 7.02 ± 0.40 | 8.00 |
| | ♀ | 6.42 | 6.85 ± 0.38 | 7.82 | | ↓ 5.80 | 6.71 ± 0.49 | 7.90 |
| *Cuspids* | | | | | | | | |
| 33(22) | ♂ | 5.80 | 6.80 ± 0.39 | 7.62 ↑ | | ↑ 6.30 | 7.00 ± 0.51 | 8.30 |
| | ♀ | 5.85 | 6.42 ± 0.36 | 7.22 ↓ | | ↓ 5.50 | 6.46 ± 0.41 | 7.10 |
| 43(27) | ♂ | 5.75 | 6.78 ± 0.40 | 7.65 ↑ | | ↑ 6.10 | 6.87 ± 0.34 | 7.40 |
| | ♀ | 5.90 | 6.41 ± 0.43 | 7.45 ↓ | | ↓ 5.60 | 6.39 ± 0.41 | 7.10 |
| *Incisors* | | | | | | | | |
| 32(23) | ♂ | 5.20 | 5.87 ± 0.40 | 6.72 | | 5.10 | 6.03 ± 0.37 | 6.80 |
| | ♀ | 5.25 | 5.84 ± 0.41 | 6.75 | | 5.30 | 5.91 ± 0.35 | 6.70 |
| 42(26) | ♂ | 5.05 | 5.86 ± 0.42 | 6.60 | | 5.00 | 6.02 ± 0.42 | 7.00 |
| | ♀ | 5.12 | 5.74 ± 0.43 | 6.85 | | 4.90 | 5.81 ± 0.41 | 6.60 |
| 31(24) | ♂ | 4.65 | 5.34 ± 0.35 | 5.95 | | 4.90 | 5.53 ± 0.34 | 6.20 |
| | ♀ | 4.50 | 5.29 ± 0.37 | 6.08 | | 4.40 | 5.45 ± 0.38 | 6.00 |
| 41(25) | ♂ | 4.65 | 5.38 ± 0.34 | 6.02 | | 4.70 | 5.52 ± 0.36 | 6.00 |
| | ♀ | 4.50 | 5.25 ± 0.40 | 6.30 | | 4.50 | 5.40 ± 0.39 | 6.20 |
| *Sums of selected mandibular teeth* | | | | | | | | |
| Σ 33 + 34 + 35 | ♂ | 18.25 | 20.88 ± 1.11 | 23.38 | | 9.90 | 21.44 ± 1.10 | 23.90 |
| Σ 33 + 34 + 35 | ♀ | 18.98 | 20.16 ± 1.00 | 22.50 | | 8.20 | 20.17 ± 1.08 | 22.70 |
| Σ 43 + 44 + 45 | ♂ | 17.75 | 20.73 ± 1.10 | 22.92 | | 9.60 | 21.16 ± 0.91 | 23.30 |
| Σ 43 + 44 + 45 | ♀ | 18.85 | 20.09 ± 1.00 | 22.80 | | 7.60 | 20.05 ± 1.22 | 23.10 |
| Σ 31 + 32 | ♂ | 10.10 | 11.21 ± 0.71 | 12.40 | | 0.00 | 11.56 ± 0.65 | 12.80 |
| Σ 31 + 32 | ♀ | 9.85 | 11.13 ± 0.74 | 12.60 | | 9.90 | 11.36 ± 0.67 | 12.60 |
| Σ 42 + 41 | ♂ | 10.15 | 11.26 ± 0.70 | 12.45 | | 9.70 | 11.53 ± 0.71 | 12.90 |
| Σ 42 + 41 | ♀ | 9.78 | 10.99 ± 0.79 | 12.80 | | 9.90 | 11.21 ± 0.72 | 12.80 |
| Σ 42 + 41 + 31 + 32 | ♂ | 20.15 | 22.50 ± 1.38 | 24.70 | | 9.70 | 23.09 ± 1.32 | 25.70 |
| Σ 42 + 41 + 31 + 32 | ♀ | 19.72 | 22.12 ± 1.53 | 25.38 | | 9.80 | 22.57 ± 1.34 | 25.30 |

Σ = sum of mesiodistal widths (International tooth numbers)

Significance of difference at $p < .05$ indicated by diverging half arrows ↑↓ or ← →

Significance of difference at $p < .01$ indicated by diverging full arrows ↑↓

No significant differences were found between the two populations in the following sums of the mesiodistal crown dimensions:

| | |
|---|---|
| $\Sigma 13(6)+14(5)+15(4)$ | maxillary |
| $\Sigma 23(11)+24(12)+25(13)$ | maxillary |
| $\Sigma 33(22)+34(21)+35(20)$ | mandibular |
| $\Sigma 43(27)+44(28)+45(29)$ | mandibular |
| $\Sigma 31(24)+32(23)$ | mandibular |
| $\Sigma 41(25)+42(26)$ | mandibular |
| $\Sigma 42(26)+41(25)+31(24)+32(23)$ | mandibular |

## — Discussion —

### *Right/Left*

These comparisons indicate that, in general, the differences between antimeres in the four subgroups (Iowa males and females, North Mexican males and females) are of very small magnitude and not clinically significant.

### *Male/Female*

Sex differences were found in both populations, most noticeably in the widths of cuspids and first molars. The sex differences were generally more pronounced in the North Mexican sample.

It is also of interest to note that incisors showed the smallest differences between the sexes.

This sexual dimorphism is consistent with the findings of other investigators (Dahlberg 1951, Moorrees 1957, Kellam 1982).

### *Iowa/Northern Mexican*

In general, no significant differences were found between the two populations in the mesiodistal crown dimensions of either males or females.

Similar values were found for both single tooth comparisons and sums of groups of teeth. As stated earlier, the tooth sums selected for study are those used in tooth-size prediction equations in the mixed dentition.

In general, estimation of the mesiodistal crown dimensions of unerupted cuspids and bicuspids involves one of three approaches:

(1) Use of measurements from erupted teeth, (Seipel 1946, Ballard and Wylie 1947, Moyers 1973, Tanaka and Johnston 1974, Moorrees and Reed 1964)

(2) Use of measurements from radiographs (Nance 1947, Foster and Wylie 1958, Cohen 1959), and

(3) Use of a combination of measurements from erupted teeth and from radiographs of unerupted teeth (Hixon and Oldfather 1958, Stahle 1959, Staley and Hoag 1978).

Regardless of the prediction method used, one has to assume that the most accurate equations for prediction of tooth size should be based on measurements obtained on the population in question, but such equations are not presently available on the Northern Mexican population.

The lack of significant differences in mesiodistal crown dimensions between the two populations suggests that the methods for prediction of tooth-size:arch-length discrepancies developed from an Iowa population (Bishara and Staley 1984) are probably also applicable to subjects from the Northern part of the Mexican Republic.

## — Summary and Conclusions —

Mesiodistal crown dimensions in two groups of individuals from Iowa

(35 males and 22 females) and Northern Mexico (26 males and 34 females) were found to be similar within the limits of normal statistical variation.

- Differences between antimeres are insignificant.
- Male/female comparisons indicate the presence of some sexual dimorphism. Cuspids and molars are siginificantly larger in males than in females. Incisors were not significantly different.
- Comparison of sums of teeth and single teeth commonly used in prediction equations developed for mixed dentition analysis indicate no significant differences between the Iowan and North Mexican samples of either sex. A/O

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