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***AN ATLAS OF CRANIOFACIAL GROWTH:  
Cephalometric Standards from the  
University School Growth Study,  
The University of Michigan***

By

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Dental Library

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## Introduction

History. About 1930, Dean Willard Olson and Professor Byron O. Hughes established an extensive longitudinal growth study at the School of Education, University of Michigan, using as subjects children as they were enrolled in the University School and followed through grade 12 (or approximately 3 to 18 years of age). Extensive psychological, behavioral, educational, and physical growth data were gathered on these children. Dental casts, lateral jaw radiographs and occlusal plane radiographs were the only dental data obtained in the beginning of the study. Each year a graduate student in orthodontics was appointed as a research assistant in the School of Education and was responsible for gathering the dental data. The gathering of dental data was originally under the supervision of the late Professor George Moore, at the time Chairman of the Orthodontic Department.

In 1953 the taking of yearly cephalometric radiographs on the school children was begun and the taking of lateral jaw and occlusal plane radiographs was discontinued. In 1955 the National Institutes of Health awarded Dr. Robert Moyers (Chairman of the Orthodontics Department, 1953-1966) a research grant to support the gathering and analysis of the data. This grant (D-0224) continued until December 1966. In 1966, Professor Donald H. Enlow of the Department of Anatomy and Professor Moyers obtained a large program project grant from the National Institutes of Health (HD 02272) for the purposes of a multidisciplinary study

on craniofacial growth and development. One of the main aspects of this larger project was the development of methods of computerizing and storing the serial data gathered in the University Elementary and Secondary School growth study. That program project grant was renewed in 1971 and is still active today as USPHS grant DE 43120 with Professor Moyers as Principal Investigator.

Purposes. This monograph, the second in a series of monographs in craniofacial growth from the Center for Human Growth and Development, has several purposes: (1) to provide a statistical description of a large segment of the craniofacial data for the University Elementary and Secondary School study; (2) to provide a ready reference to a large serial sample of craniofacial data for those persons in laboratories who do not have access to such data; (3) to permit comparisons of our data with other similar longitudinal growth data; (4) to inform other workers of the potential uses of our data set and to offer them the opportunity for cooperative and comparative analyses.

The atlas contains only descriptive statistical information. The decision to limit the analysis to a descriptive level was quite deliberate since, (1) it was decided that the publication of the unreduced information was useful; (2) the number of measures considered was too large for a more sophisticated analysis which would necessarily require individual consideration of each variable; and (3) it was felt that interpretive analysis of specific problems should be presented in journal articles. Even though not included here, future use of the measures derived for this

atlas will produce;

- (a) more detailed studies of averages in individual growth patterns for specific variables;
- (b) information concerning growth based on differences between successive years;
- (c) recommendations for a representative subcollection of variables;
- (d) studies in which selected cephalometric variables will be analyzed in conjunction with dental variables measured from a comparative set of dental casts from the same individuals. The cast data are already stored and will be combined with the cephalometric data in future studies.

## Methods

Sample group. Eighty three individuals, 47 males and 36 females, with continuous attendance at the University School over the period ranging from their sixth to sixteenth birthdays were selected out of the total sample for the current study. The data collected consisted of lateral, posteroanterior, and right and left oblique cephalograms and maxillary and mandibular dental casts. Height and weight data were also included. The data from this study were taken exclusively from the lateral cephalometric radiographs of those children who were not treated orthodontically during or previous to the dates of the data collection. All records were taken on birthdays when the birthdate fell during

the school year. The data of the children having birthdays outside of the school year were collected on their half year birthdate. For the purpose of the current study age groups were determined by including in each age cephalograms taken six months before a birthmonth through five months after a birthmonth.

Tracing of cephalograms. Each lateral cephalogram used in the present study was traced four times. The first three sets of tracings were rejected because of quality variations revealed by serial evaluation of inconsistencies in tracing routine and in landmark placement. In the final set of tracings the landmarks were originally designated by the tracer. The tracing was then reviewed by a second person and the landmarks were ordered numerically for storage. Since the landmark order was critical, a third reviewer checked the series again. Individual tracing sets were then sent to the Actron Corporation\* for digitization and storage on magnetic tape.

Computer storage. With few exceptions, cephalometric data for computer analysis used in previously reported studies consisted of linear or angular measures taken directly from the radiographs or more commonly from tracings of the radiographs. To obtain additional variables for later analysis, it was usually necessary for the researcher to go back to the raw data form, collect the new cephalometric measurements or points, and finally merge the old and new data.

Early in the development of our cephalometric data base at the Center for Human Growth and Development, the need for a new computer method was recognized, a method which would allow for

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\*Actron Corporation, 700 Royal Oaks Drive, Monrovia, California 91016.

both the display of shape and area and for the calculation of new points of interest from existing computer data. The collection of cephalometric data as a series of points (x and y coordinates) to represent bone contour and cephalometric landmarks was undertaken. The Grafacon system (Miller, et al., 1970) was originally used to collect coordinate data from the cephalometric tracings. The Grafacon coding device however was sensitive to electrical interference, often resulting in data containing a considerable amount of noise and spurious data. Also, the system depended on the operator to manually trace the stylus over the outline. The resulting need for "cleaning" the data and the difficulty of quality control led to the investigation of other methods.

The TRIDEA system (Miller, et al., 1971) was found to remedy the above difficulties since this system had an automatic line follower and was not sensitive to outside electrical disturbances. In this procedure the cephalometric tracings were scanned by an automatic computer-controlled line follower whose position provided x and y coordinates for storage of the information on magnetic or paper tape (Fig. 1). A special console control was used to flag certain points, indicating landmarks, ends of lines, etc. (Fig. 2). The collection of a typical tracing of approximately 3,000 points required nine minutes. The point to point accuracy of the Actron system was .002 inches. Since the encoding of the data was carried out by an operator of the Actron Corporation who was not familiar with cephalometrics, all traces had to be carefully prepared in a systematic way at the Center for Human



Figure 1. Digitizing control and monitor panel of Actron system.

Growth and Development. This proved to be economically advantageous in the long run since the resulting data set was much more consistent than that obtained from previous methods and the necessity of operator decisions on contours and landmarks at encoding time was eliminated.

Error checking. The data returned to the Center from Actron was on magnetic tape in character format. In addition a plot image of the data was recorded on mylar sheets. The first step in the processing at the Center was a careful comparison of the plots with the original tracings to check that all material was included and that the correct lines had been followed. At this stage computer processing of the data was initiated using the University of Michigan 360/67 computer operating under the Michigan Terminal



Figure 2. Complete computer, data remodeling and monitor components of the Actron system.

System and programs developed at the Center. The initial step was a check for invalid characters, codes, and record lengths of the raw data. In addition, the collection accuracy of the data was checked and verified. During encoding the landmarks had been numbered sequentially and the bony contours were also taken in a fixed order. A landmark was checked to see if it fell in the correct order on its respective contour within a given tolerance and error comments were generated if the given tolerance was exceeded. If the data of a subject met all of the error checking specifications, these new subject ages were added to a fast retrieval data bank.

Retrieval system. The retrieval system is based on magnetic tapes accessed by a set of FORTRAN callable subroutines. Programs utilizing these subroutines are able to retrieve, delete and

add specific subjects ages or sets of points in the data base. These programs are general and permit the storage or retrieval of any outline, i.e., hand bone outlines can be included without difficulty.

Additional landmarks, including several used in this atlas, were calculated using various geometric operations on the existing landmark-contour combinations. Once a set of landmarks had been generated, linear and angular measurements were computed using a general program that could be applied to any point set. Such measurements included distances, angles, perpendicular distances, differences, sums and multiplications and additions of variables. The Michigan Interactive Data Analysis System (MIDAS) was used to perform the statistical functions on the measurements. The mean, standard deviation, and sample count values calculated by MIDAS were used as input to programs which produced the CalComp plots and printed tables which are included in this atlas.

## Utilization of Atlas

Figure 3 is a reduced example of a typical text page. Each such page contains several components which are described below with reference to the figure.

(A) An identification block appears in the upper right corner. It contains the complete designation of the measurement (e.g., Anterior Nasal Spine — Nasion), its abbreviation (ANS-N), and the landmark numbers involved in its computation. In addition, it contains a designation of the type of measurement (i.e., linear or angular) and the variable number (i.e., 130 in the figure). This number is useful in locating other tabled references to this variable.

(B) A drawing in the upper left corner illustrates diagrammatically where the measurement is made. For linear measurements, a dark line designates the measurement; for angular measurements, lines are drawn to show the construction of the angle.

(C) Tabulated data is given for each sex. The quantities tabulated are the age of measurement (i.e., 6 to 16 years), the sample size at each age, the estimated mean value at each age, and the estimated standard deviation. This last quantity is defined as:

$$s = \sqrt{\frac{\sum_{i=1}^N (X_i - \bar{X})^2}{N-1}}$$

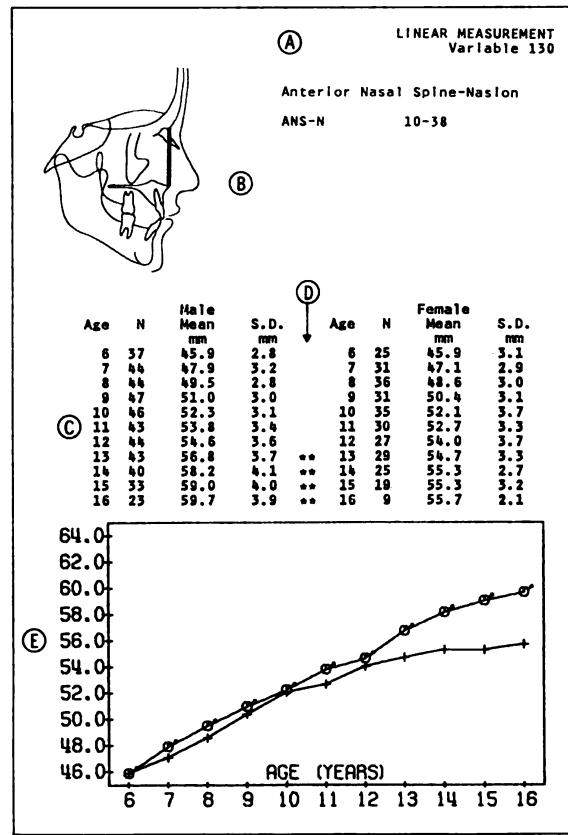


Figure 3. Sample page of atlas.

It is given as a measure of variability in the population. If one assumes that the data are normally distributed, one would expect 95% of data values to be within two standard deviations of the mean. The tabulated quantity is, in particular, not the standard error of the mean which is defined by  $(1/n)^{1/2} = S.D.$

(D) A column of asterisks (\*) may appear between the male and female tabulations. The presence of a single asterisk on the line for a particular age indicates that the 2 sample t-test comparing the male and female samples was significant at the .05

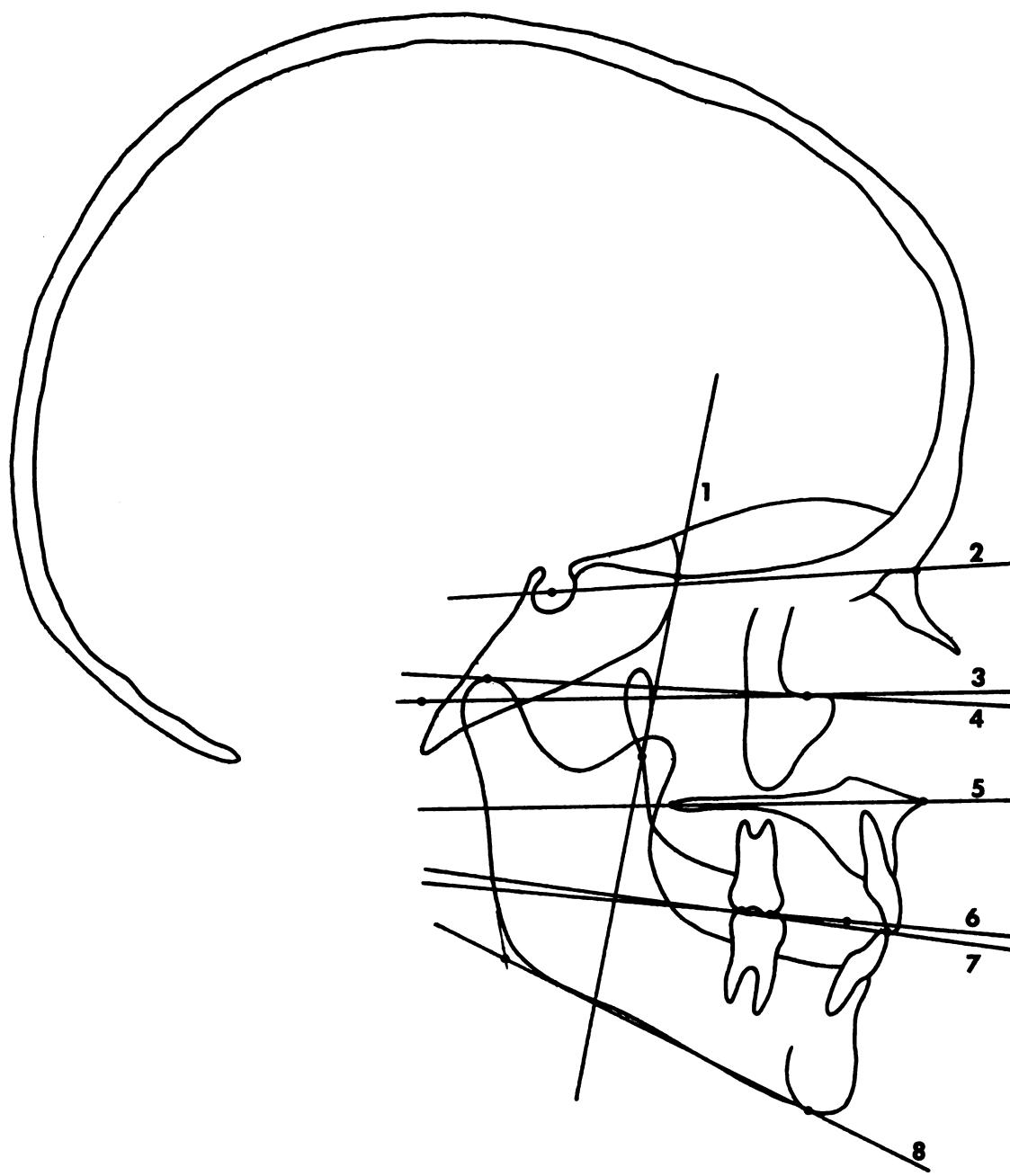
level of significance. Two asterisks indicate that it was significant at the .02 level of significance. In the figure, significant sexual dimorphism can be found at ages 13-16. Some measurements show no sexual dimorphism so consequently no asterisks appear. Since a univariate test was performed at each age even though the data came from basically the same individuals, the tests at various ages are certainly not independent of each other.

(E). The graph at the bottom of the page shows the male and female mean values plotted against age. The plot characters for each sex are different. The scale on the vertical axis has been chosen separately for each variable with increments of 0.5, 1, 2, or 5 units.

## Cephalometric Planes

The following planes have been utilized throughout this atlas:

- 1) PM VERTICAL - Pterygo-Maxillary Fissure, Inferior - Ethmoid Registration Point.  
PTM-SE (43-36).
- 2) SELLA-NASION PLANE - Sella - Nasion.  
S-N (35-38).
- 3) CONDYLAR PLANE - Condylion - Orbitale.  
CO-OR (33-40).
- 4) FRANKFORT PLANE - Porion - Orbitale.  
PO-OR (49-40).
- 5) PALATAL PLANE - Anterior Nasal Spine - Posterior Nasal Spine.  
ANS-PNS (10-45).
- 6) FUNCTIONAL OCCLUSAL PLANE - Premolar Mesial Contact Point - Upper Molar Distal Cusp Tip.  
PMC-UDT (46-23).
- 7) DOWNS OCCLUSAL PLANE - Anterior Downs Point - Posterior Downs Point.  
ADP-PDP (56-57).
- 8) MANDIBULAR PLANE - Menton - Gonial Intersection.  
ME-GOI (1-28).



**Figure 4. Cephalometric Planes.** See page 12 for the descriptions of the planes utilized in this atlas.

## Landmark Definitions

<u>Number</u>	<u>Code</u>	<u>Definition</u>
1	ME	MENTON - The most inferior point on the symphyseal outline.
2	GN	GNATHION - The most anterior-inferior point on the contour of the bony chin symphysis. Determined by bisecting the angle formed by the mandibular plane and a line through Pogonion and Nasion.
3	PG	POGONION - The most anterior point on the contour of the bony chin. Determined by a tangent through Nasion.
4	B	B POINT - The point most posterior to a line from Infradentale to Pogonion on the anterior surface of the symphyseal outline of the mandible. B Point should lie within the apical third of the incisor roots. When there is no curvature in this region and determination of B Point is not possible by the above method, it is chosen with the aid of preceding or succeeding films because erupting teeth obscure mandibular concavity on occasion.
5	ID	INFRAVENTALE - The anterior superior point on the mandible at its labial contact with the mandibular central incisor.
6	LIE	LOWER INCISOR INCISAL EDGE - The incisal tip of the mandibular central incisor.
7	UIE	UPPER INCISOR INCISAL EDGE - The incisal tip of the maxillary central incisor.
8	SD	SUPRADENTALE - The most anterior inferior point on the maxilla at its labial contact with the maxillary central incisor.
9	A	A POINT - The most posterior point on the curve of the maxilla between the anterior nasal spine and supradentale.
10	ANS	ANTERIOR NASAL SPINE - The tip of the median, sharp bony process of the maxilla at the lower margin of the anterior nasal opening.
11	L	L POINT - Represents a point on the anterior surface on the image of the labial lamella at the apex region of the maxillary central incisor. When the permanent incisors (before eruption) are positioned

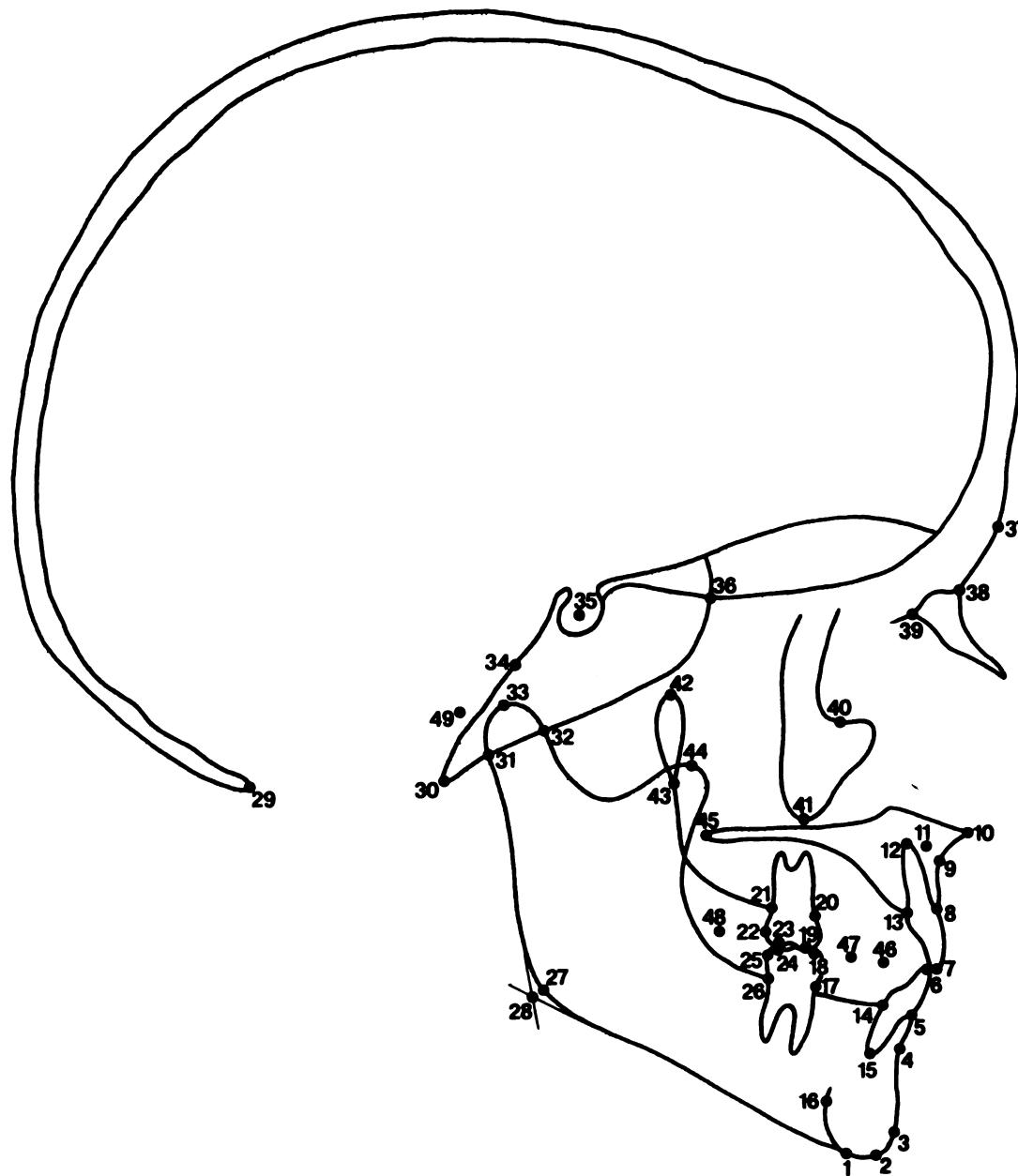
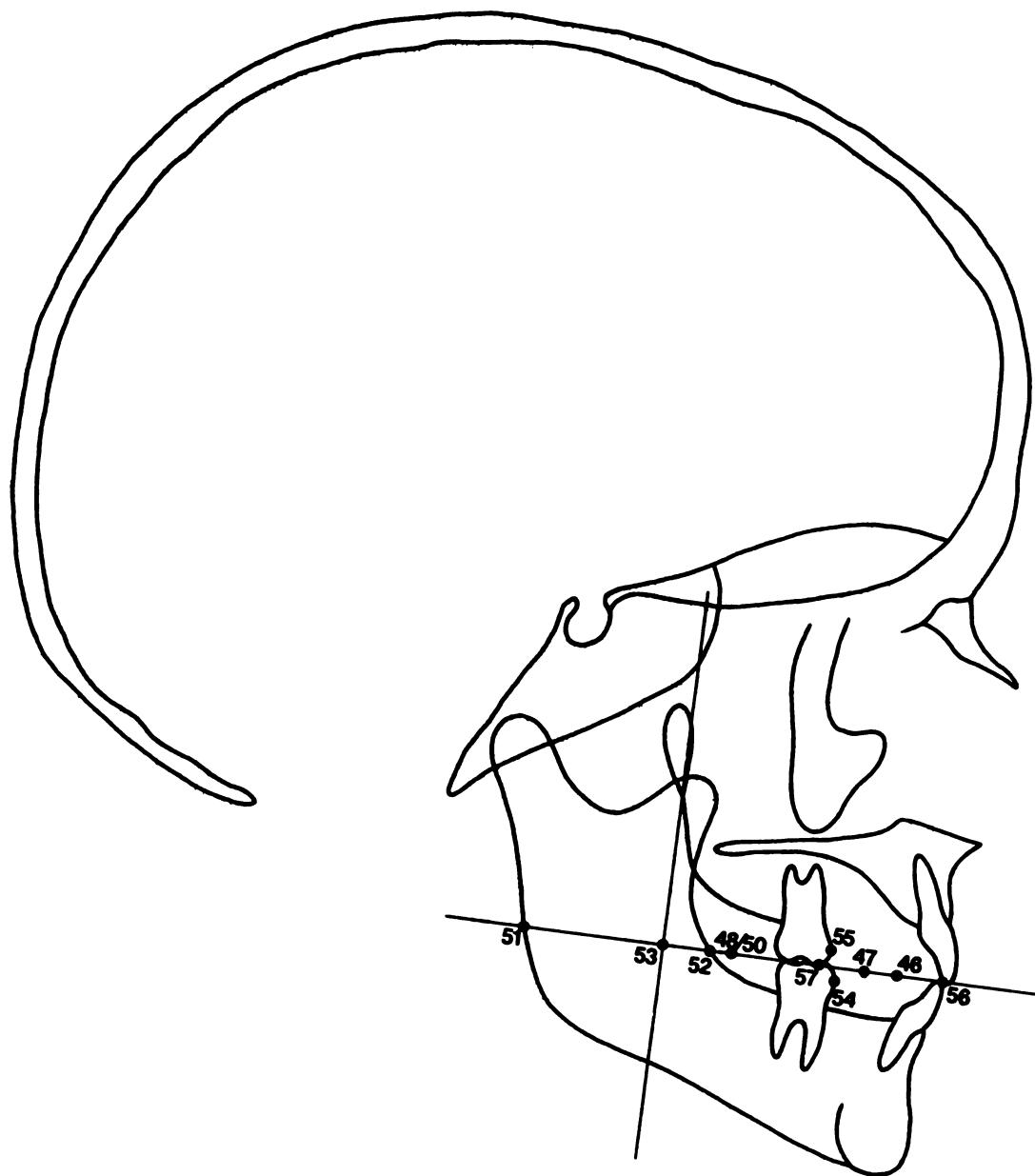


Figure 5. Cephalometric landmarks (1-49). See pages 14, 16, 17, 18 and 20 for the definitions of the above landmarks.

<u>Number</u>	<u>Code</u>	<u>Definitions</u>
		within bone with their crown in the apical base region, L Point is taken 1-2 millimeters anterior to the height of contour of the crown relative to and on a line drawn through supradentale and parallel to the axis of the central incisor. When the permanent incisors are erupted and their roots are not fully formed, L Point is located at the root end along an axially placed line through supradentale. When the root is completed, L Point is located along the same axial line at the root tip. The procedure for locating L Point is well illustrated by van der Linden, Amer. J. Orthodont., 59:111-125, 1971.
12	UIA	UPPER INCISOR APEX - The root tip of the maxillary central incisor. In cases where the root is not yet completed, the midpoint of the growing root tip is marked.
13	UIB	UPPER INCISOR LINGUAL BONY CONTACT POINT - The lingual contact of alveolar bone with the maxillary central incisor. This point generally corresponds with the lingual cemento enamel junction (CEJ).
14	LIB	LOWER INCISOR LINGUAL BONY CONTACT POINT - The lingual contact of alveolar bone with the mandibular central incisor. Generally corresponds with the lingual CEJ.
15	LIA	LOWER INCISOR APEX - The root tip of the mandibular central incisor. When the root is not yet completed, the midpoint of the growing root tip is marked.
16	SYMP	LINGUAL SYMPHYSEAL POINT - A constructed point used to determine symphyseal width at Pogonion. The SYMP Point is located at the intersection of a construction line through Pogonion and parallel with the mandibular plane with the posterior border of the mandibular symphysis.
17	LMJ	LOWER MOLAR MESIAL CEJ - The anterior cemento-enamel junction of the mandibular first molar.
18	LMT	LOWER MOLAR MESIAL CUSP TIP - The anterior cusp tip of the mandibular first molar.
19	UMT	UPPER MOLAR MESIAL CUSP TIP - The anterior cusp tip of the maxillary first molar.
20	UMJ	UPPER MOLAR MESIAL CEJ - The anterior cemento-enamel junction of the maxillary first molar.

<u>Number</u>	<u>Code</u>	<u>Definition</u>
21	UDJ	UPPER MOLAR DISTAL CEJ - The posterior cemento-enamel junction of the maxillary first molar.
22	UDC	UPPER MOLAR DISTAL CONTACT POINT - The posterior contact (height of contour) of the maxillary first molar.
23	UDT	UPPER MOLAR DISTAL CUSP TIP - The posterior cusp tip of the maxillary first molar.
24	LDT	LOWER MOLAR DISTAL CUSP TIP - The posterior cusp tip of the mandibular first molar.
25	LDC	LOWER MOLAR DISTAL CONTACT POINT - The posterior contact point of the mandibular first molar.
26	LDJ	LOWER MOLAR DISTAL CEJ - The posterior cemento-enamel junction of the mandibular first molar.
27	GO	GONION - The midpoint of the angle of the mandible. Found by bisecting the angle formed by the mandibular plane and a plane through Articulare, Posterior and along the portion of the mandibular ramus inferior to it.
28	GOI	GONIAL INTERSECTION - The intersection of the mandibular plane with a plane through Articulare, Posterior and along the portion of the mandibular ramus inferior to it.
29	OP	OPISTHION - The posterior midsagittal point on the posterior margin of foramen magnum.
30	BA	BASION - The most inferior, posterior point on the anterior margin of foramen magnum.
31	AR	ARTICULARE (Articulare Posterior) - The Point of intersection of the inferior cranial base surface and the averaged posterior surfaces of the mandibular condyles.
32	AA	ARTICULARE, ANTERIOR - The point of intersection of the inferior surface of the cranial base and the averaged anterior surfaces of the mandibular condyles.
33	CO	CONDYLION - The most posterior superior point on the curvature of the average of the right and left outlines of the condylar head. Determined as the point of tangency to a perpendicular construction line to the anterior and posterior borders of the

<u>Number</u>	<u>Code</u>	<u>Definition</u>
		condylar head. The CO point is, therefore, located as the most superior axial point of the condylar head rather than as the most superior point on the condyle.
34	SOS	CENTER OF THE SPHENO-OCCIPITAL SYNCHONDROSIS - The midpoint of the cartilaginous union of the anterior end of the basilar portion of the occipital bone and the posterior surface of the body of the sphenoid bone. In cases where the synchondrosis is not readily apparent, it is located by comparison with either previous or subsequent cephalograms.
35	S	SELLA TURCICA - The center of the pituitary fossa of the sphenoid bone. Determined by inspection.
36	SE	ETHMOID REGISTRATION POINT - Intersection of the sphenoidal plane with the averaged greater sphenoid wing.
37	GB	GLABELLA - The height of curvature of the bone overlying the frontal sinus. In cases where this point is not readily apparent, the overlying soft tissue is used to locate it.
38	N	NASION - The junction of the frontonasal suture at the most posterior point on the curve at the bridge of the nose.
39	FMN	FRONTOMAXILLARY NASAL SUTURE - The junction of the frontal, maxillary and nasal bones.
40	OR	ORBITALE - The lowest point on the average of the right and left borders of the bony orbit.
41	IZ	INFERIOR ZYGOMA - The lowest point on the average of the right and left outlines of the zygoma.
42	PTMS	PTERYGO-MAXILLARY FISSURE, SUPERIOR - The most superior point on the average of the right and left outlines of the pterygo-maxillary fissure.
43	PTM	PTERYGO-MAXILLARY FISSURE, INFERIOR - The most inferior point on the average of the right and left outlines of the pterygo-maxillary fissure.
44	CP	CORONOID PROCESS - The most superior point on the average of the right and left outlines of the coronoid process. Determined as the point of tangency to a perpendicular drawn to the plane of the anterior border of the ramus.

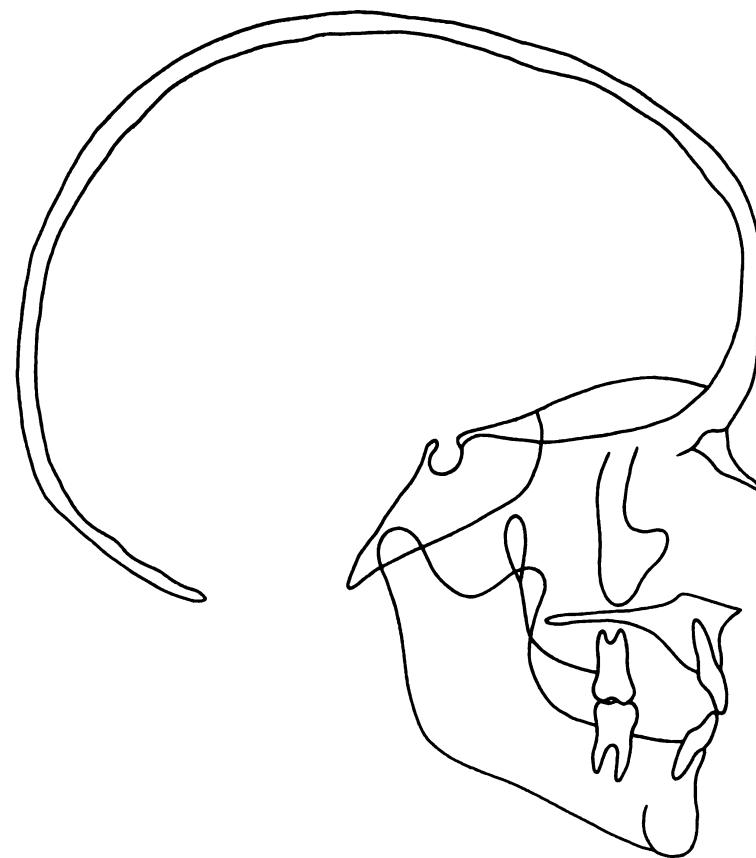


**Figure 6. Cephalometric landmarks (46-57).** See pages 20 and 21 for the definitions of the above landmarks.

<u>Number</u>	<u>Code</u>	<u>Definition</u>
45	PNS	POSTERIOR NASAL SPINE - The most posterior point at the sagittal plane on the bony hard palate.
46	PMC	PREMOLAR MESIAL CONTACT POINT - A point established by the intersection of a line along the occlusal contact of the upper and lower premolars and a perpendicular line to it through the averaged anterior contact of the first maxillary premolars with the maxillary cuspid.
47	PDC	PREMOLAR DISTAL CONTACT POINT - Established along the same premolar occlusion line as point 46 but at the point of a perpendicular line through the distal contact of the maxillary first premolar. The distance from PMC to PCD should be equal to the averaged mesial-distal distance of the first maxillary premolar.
48	TP	TRICHOTOMOUS POINT - This point has three determinative methods and interpretations: (a) when the permanent first molars are absent (not in occlusion) and the deciduous second molars are traced, point 48 is chosen along a line through points 46 and 47 and in the region of the anterior border of the mandibular ramus. Its presence in this case is to indicate that deciduous, rather than permanent teeth were traced; (b) when the first permanent molars are erupted and traced, point 48 is not marked except as below; (c) when the second permanent molars are erupted and in full occlusion, point 48 is marked at their distal contact points.
49	PO	PORION - The midpoint of the line connecting the most superior point of the radiopacity generated by each of the two ear rods of the cephalostat.
50	FPP	FUNCTIONAL OCCLUSAL PLANE POINT - This point is logically determined and is therefore not a traced landmark. It is used to define the posterior location of the functional occlusal plane and consequently its value is related to the presence (or absence) of Landmark 48. (a) If landmark 48 is present and the individual is less than 9 years of age, landmark 50 takes on the same value as landmark 48. (b) In all other cases, landmark 50 takes on the value of landmark 23.
51	PB	POSTERIOR BORDER OF THE RAMUS - This is defined as the intersection of the FOP with the posterior border of the mandibular ramus.

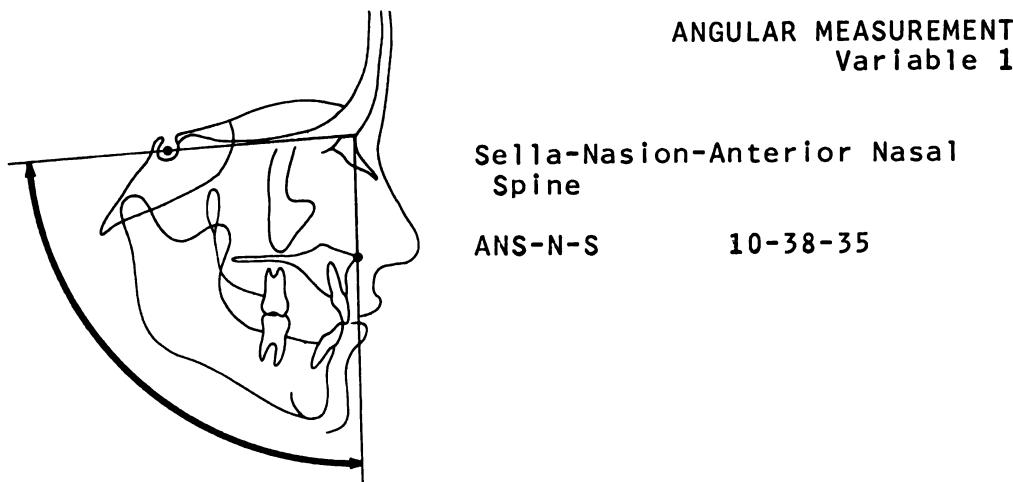
<u>Number</u>	<u>Code</u>	<u>Definition</u>
52	AB	ANTERIOR BORDER OF THE RAMUS - This is defined as the intersection of the FOP with the anterior border of the ramus.
53	LT	LINGUAL TUBerosity - The Lingual Tuberosity is derived by extending the distance between landmarks 51 and 52 anteriorly along the FOP from the intersection of the FOP and the RA Vertical Line.
54	LMC	LOWER MOLAR MESIAL CONTACT - The mesial contact (height of contour) of the mandibular first molar relative to the FOP.
55	UMC	UPPER MOLAR MESIAL CONTACT - The mesial contact (height of contour) of the maxillary first molar relative to the FOP.
56	ADP	ANTERIOR DOWNS POINT - The midpoint of the line connecting landmarks 6 and 7 (LIE and UID). This represents the anterior point through which Downs Occlusal Plane passes.
57	PDP	POSTERIOR DOWNS POINT - The midpoint of the line connecting landmarks 18 and 19 (LMT and UMT). This represents the posterior point through which Downs Occlusal Plane passes.



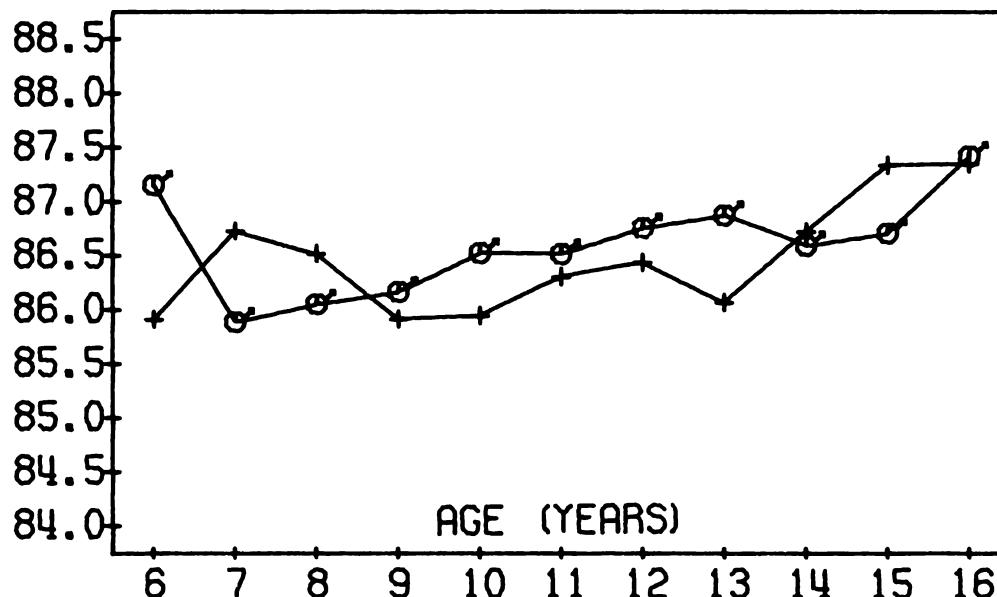


## ANGULAR MEASUREMENTS (Variables 1-74)

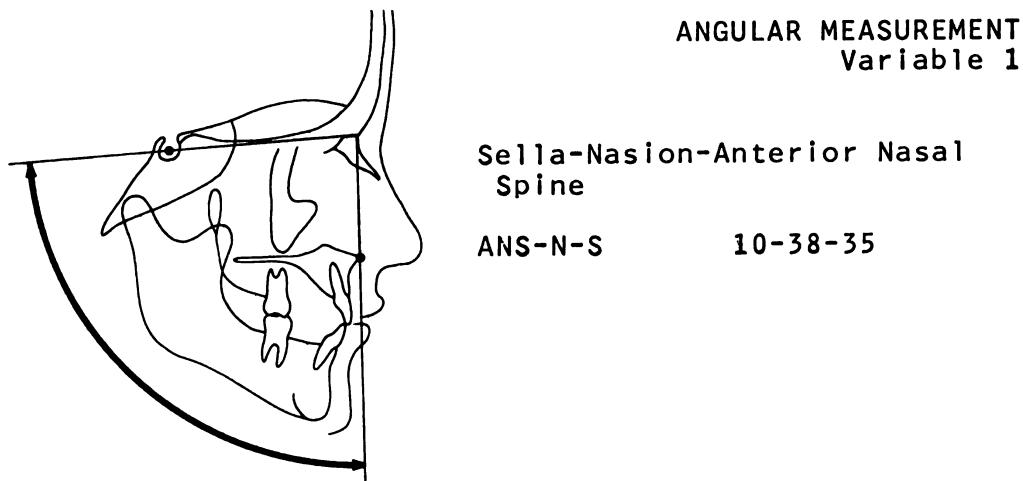




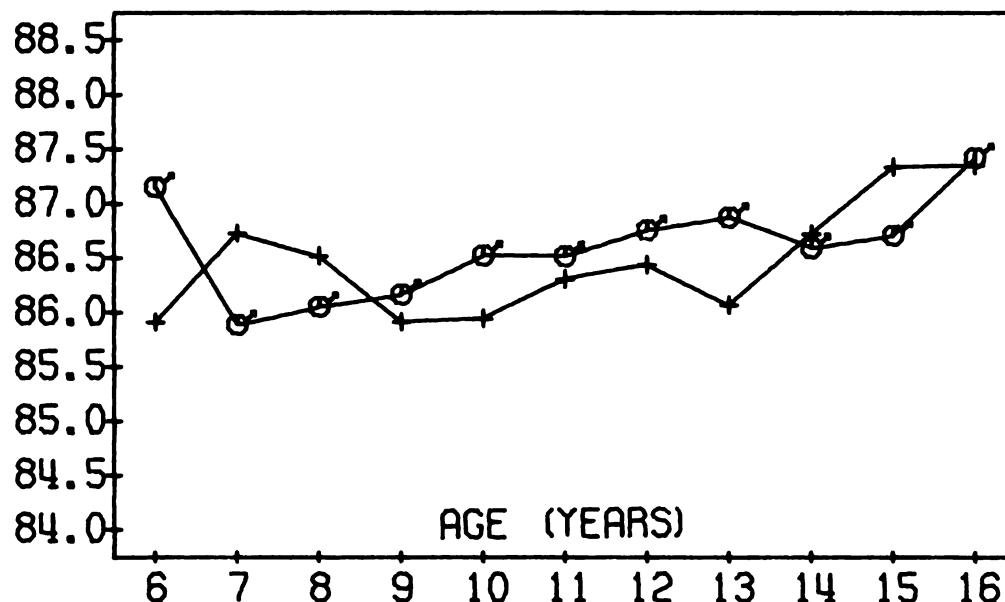
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	87.2	3.8	6	25	85.9	3.3
7	44	85.9	3.0	7	31	86.7	3.5
8	44	86.1	3.4	8	36	86.5	3.6
9	47	86.2	3.2	9	31	85.9	3.0
10	46	86.5	3.3	10	35	85.9	3.8
11	43	86.5	3.2	11	30	86.3	4.4
12	44	86.8	3.7	12	27	86.4	3.7
13	43	86.9	3.6	13	29	86.1	4.0
14	40	86.6	3.7	14	25	86.7	4.2
15	33	86.7	3.5	15	19	87.3	3.6
16	23	87.4	4.6	16	9	87.3	4.1



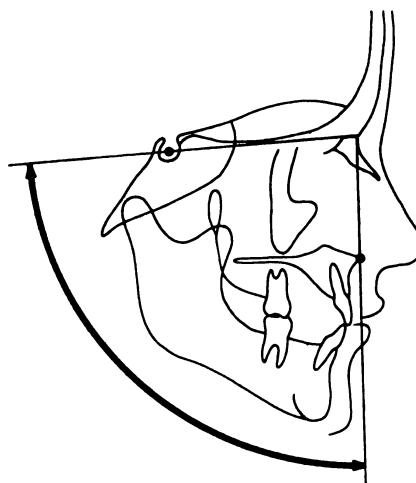




Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	87.2	3.8	6	25	85.9	3.3
7	44	85.9	3.0	7	31	86.7	3.5
8	44	86.1	3.4	8	36	86.5	3.6
9	47	86.2	3.2	9	31	85.9	3.0
10	46	86.5	3.3	10	35	85.9	3.8
11	43	86.5	3.2	11	30	86.3	4.4
12	44	86.8	3.7	12	27	86.4	3.7
13	43	86.9	3.6	13	29	86.1	4.0
14	40	86.6	3.7	14	25	86.7	4.2
15	33	86.7	3.5	15	19	87.3	3.6
16	23	87.4	4.6	16	9	87.3	4.1







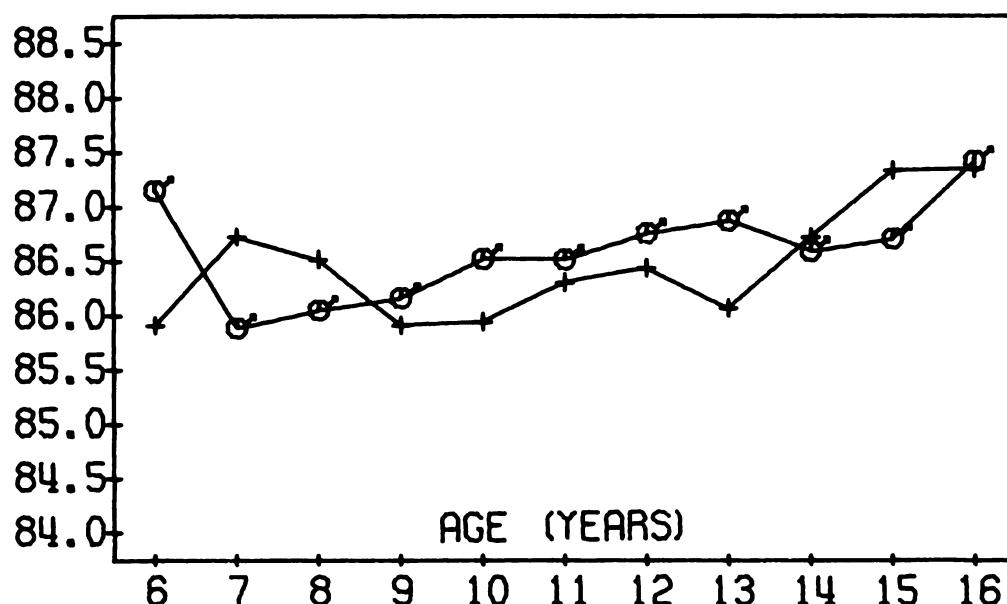
ANGULAR MEASUREMENT  
Variable 1

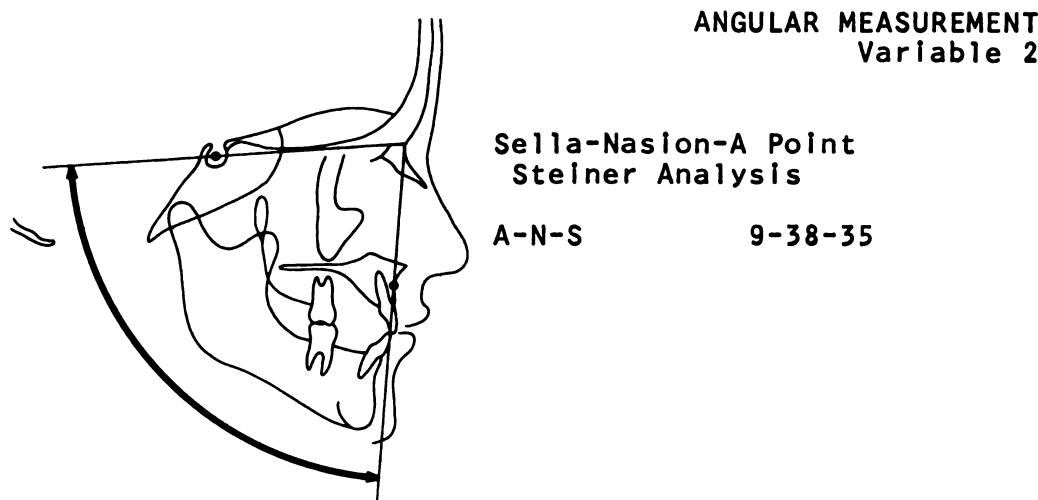
Sella-Nasion-Anterior Nasal  
Spine

ANS-N-S

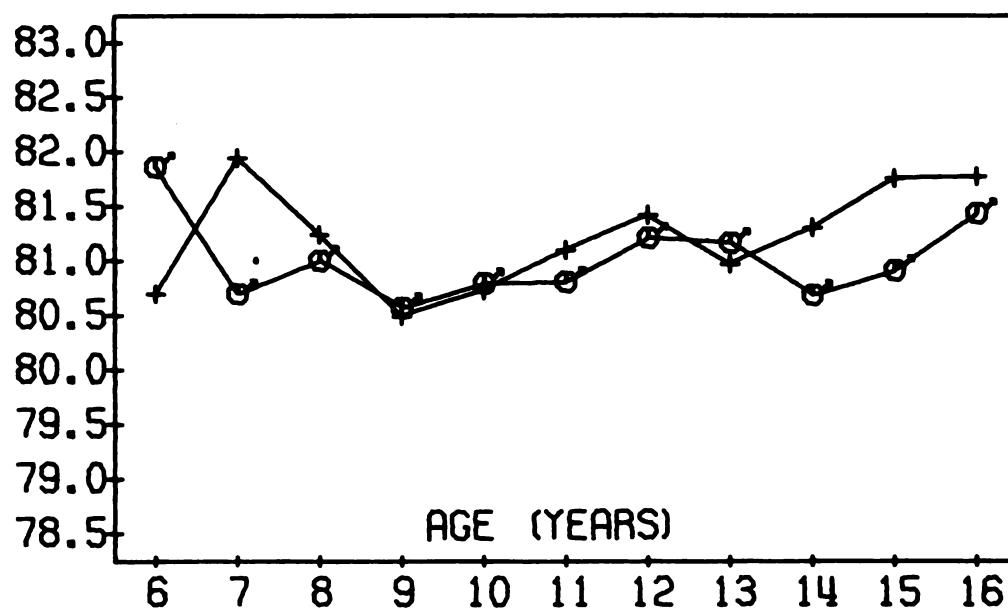
10-38-35

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	87.2	3.8	6	25	85.9	3.3
7	44	85.9	3.0	7	31	86.7	3.5
8	44	86.1	3.4	8	36	86.5	3.6
9	47	86.2	3.2	9	31	85.9	3.0
10	46	86.5	3.3	10	35	85.9	3.8
11	43	86.5	3.2	11	30	86.3	4.4
12	44	86.8	3.7	12	27	86.4	3.7
13	43	86.9	3.6	13	29	86.1	4.0
14	40	86.6	3.7	14	25	86.7	4.2
15	33	86.7	3.5	15	19	87.3	3.6
16	23	87.4	4.6	16	9	87.3	4.1

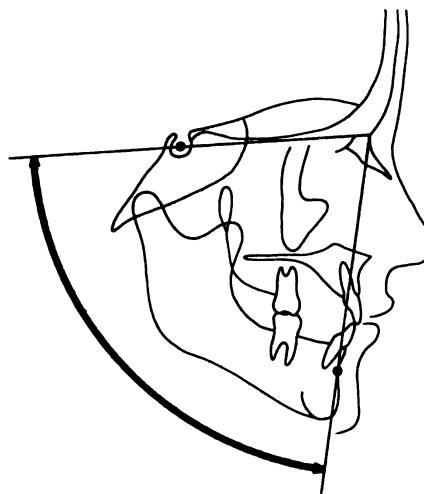




Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	81.9	3.3	6	25	80.7	3.0
7	44	80.7	3.0	7	31	81.9	3.0
8	44	81.0	3.1	8	36	81.2	3.3
9	47	80.6	3.0	9	31	80.5	3.2
10	46	80.8	3.1	10	35	80.7	3.7
11	43	80.8	3.0	11	30	81.1	3.8
12	44	81.2	3.3	12	27	81.4	3.6
13	43	81.2	3.4	13	29	81.0	3.8
14	40	80.7	3.4	14	25	81.3	3.5
15	33	80.9	3.2	15	19	81.8	3.5
16	23	81.4	4.4	16	9	81.8	3.7



ANGULAR MEASUREMENT  
Variable 3

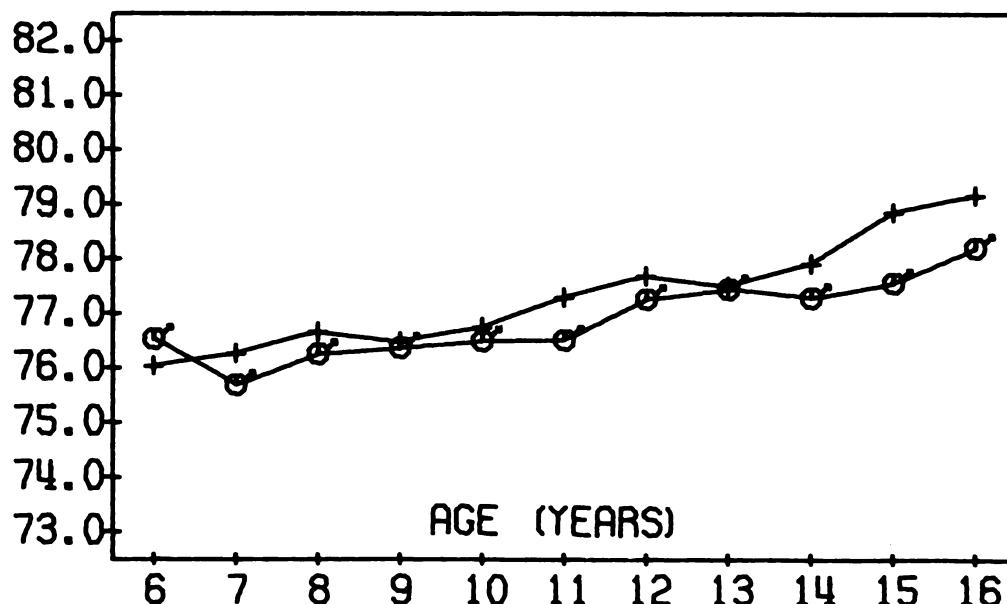


Sella-Nasion-B Point  
Steiner Analysis

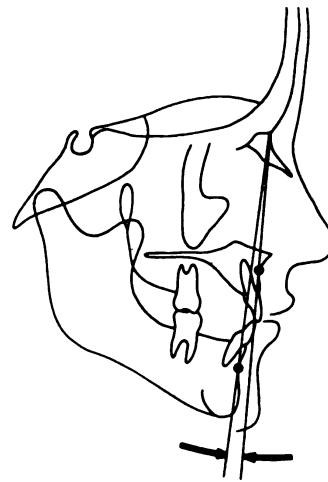
B-N-S

4-38-35

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	76.5	2.6	6	25	76.0	3.5
7	44	75.7	2.8	7	31	76.3	3.1
8	44	76.3	2.8	8	36	76.7	3.3
9	46	76.4	2.5	9	31	76.5	3.4
10	45	76.5	2.5	10	35	76.7	3.5
11	43	76.5	2.6	11	30	77.3	3.9
12	44	77.3	2.7	12	27	77.7	3.4
13	43	77.5	3.0	13	29	77.5	3.9
14	40	77.3	3.1	14	25	77.9	3.8
15	33	77.6	3.0	15	19	78.9	3.9
16	23	78.2	3.9	16	9	79.2	2.3



ANGULAR MEASUREMENT  
Variable 4

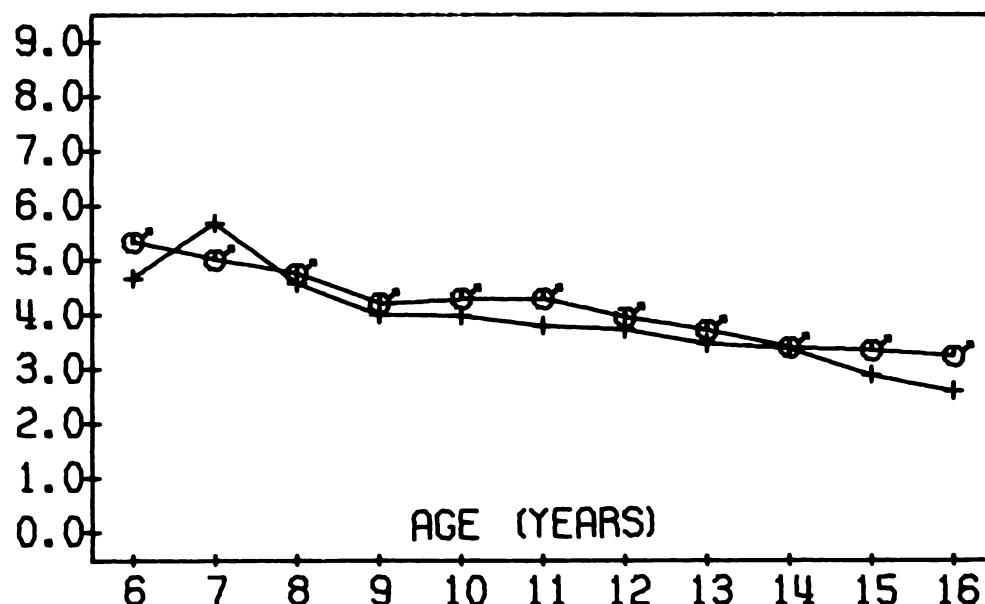


A Point-Nasion-B Point  
Steiner Analysis

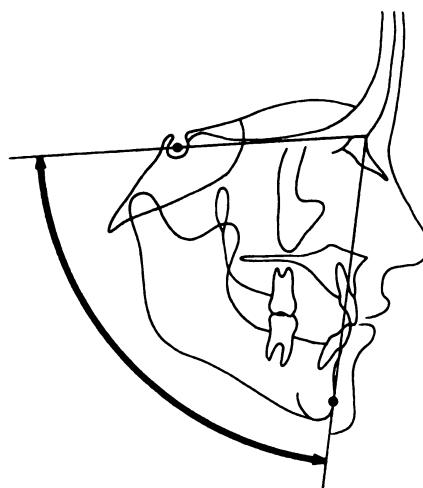
A-N-B

9-38-4

Age	N	Male Mean deg.	S.D. deg.	Age	N	Female Mean deg.	S.D. deg.
6	37	5.3	2.2	6	25	4.7	2.2
7	44	5.0	2.3	7	31	5.7	2.7
8	44	4.8	2.2	8	36	4.6	2.4
9	46	4.2	1.9	9	31	4.0	2.6
10	45	4.3	2.0	10	35	4.0	2.7
11	43	4.3	1.9	11	30	3.8	2.2
12	44	3.9	2.1	12	27	3.7	2.4
13	43	3.7	2.0	13	29	3.5	2.4
14	40	3.4	2.0	14	25	3.4	2.5
15	33	3.3	2.1	15	19	2.9	2.7
16	23	3.2	2.3	16	9	2.6	2.4



ANGULAR MEASUREMENT  
Variable 5

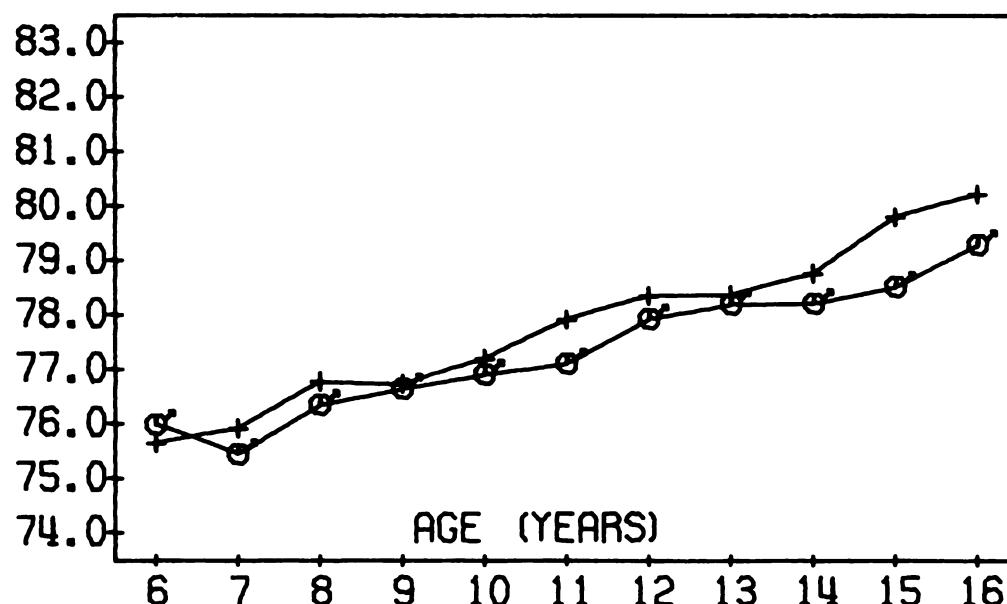


Sella-Nasion-Pogonion

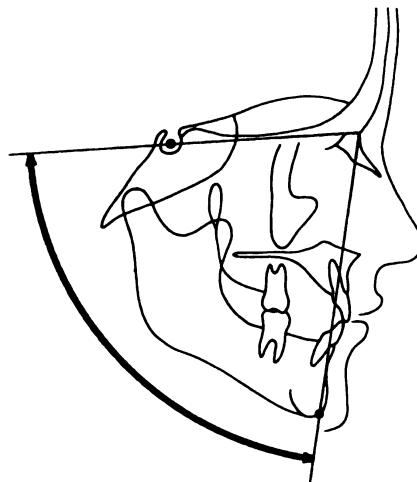
PG-N-S

3-38-35

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	76.0	2.4	6	25	75.6	3.6
7	44	75.4	2.6	7	31	75.9	3.1
8	44	76.4	2.7	8	36	76.8	3.3
9	46	76.7	2.5	9	31	76.7	3.3
10	45	76.9	2.4	10	35	77.2	3.5
11	43	77.1	2.5	11	30	77.9	3.9
12	44	77.9	2.6	12	27	78.4	3.4
13	43	78.2	2.8	13	29	78.4	4.0
14	40	78.2	3.0	14	25	78.8	4.1
15	33	78.5	3.1	15	19	79.8	4.1
16	23	79.3	3.5	16	9	80.2	2.5



ANGULAR MEASUREMENT  
Variable 6

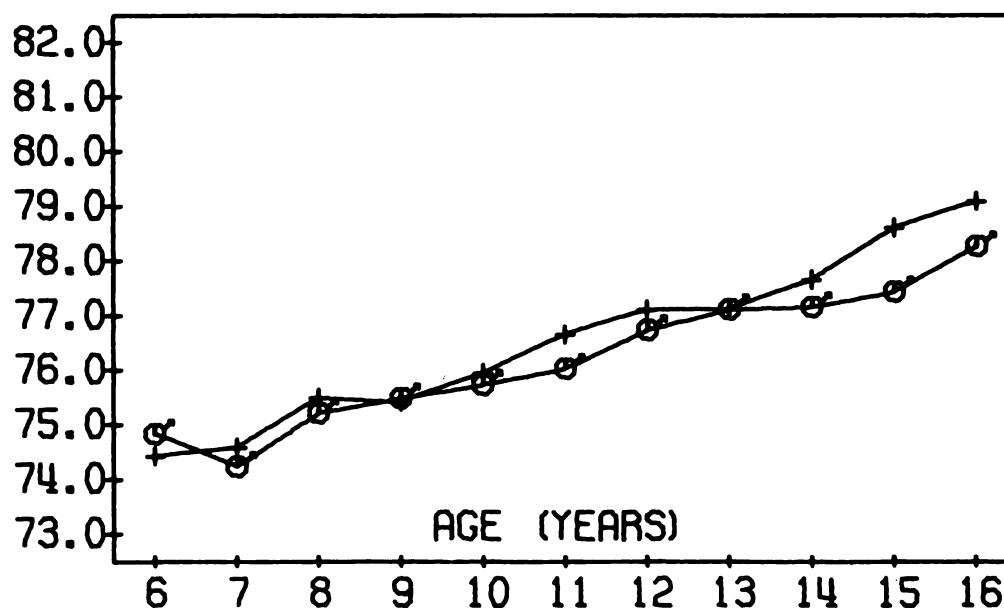


Sella-Nasion-Gnathion

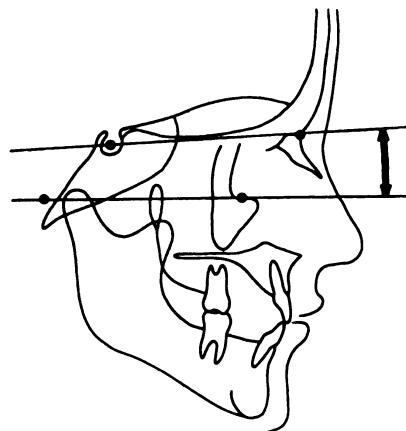
GN-N-S

2-38-35

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	74.8	2.4	6	25	74.4	3.7
7	44	74.2	2.6	7	31	74.6	3.1
8	44	75.2	2.7	8	36	75.5	3.3
9	46	75.5	2.5	9	31	75.4	3.3
10	45	75.7	2.4	10	35	75.9	3.5
11	43	76.0	2.5	11	30	76.6	3.9
12	44	76.7	2.6	12	27	77.1	3.4
13	43	77.1	2.9	13	29	77.1	4.0
14	40	77.2	3.0	14	25	77.7	4.2
15	33	77.5	3.0	15	19	78.6	4.2
16	23	78.3	3.6	16	9	79.1	2.5



ANGULAR MEASUREMENT  
Variable 7

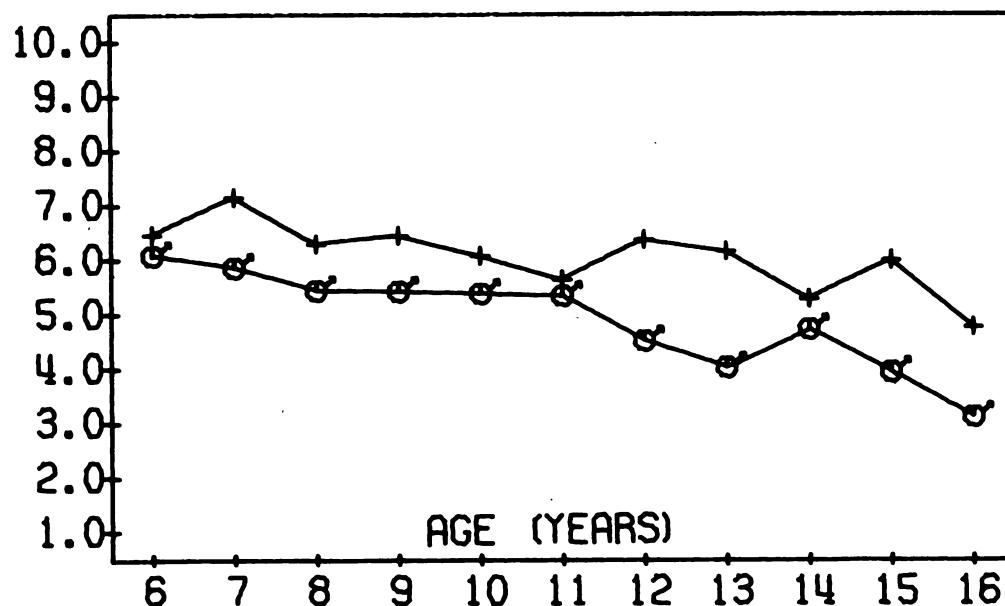


Sella-Nasion/Frankfort Plane

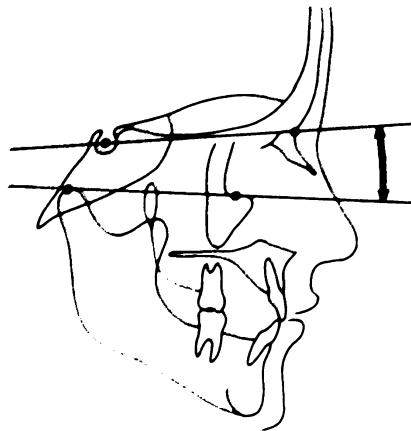
N-S/OR-PO

38-35/40-49

Age	N	Male Mean deg.	S.D. deg.	Age	N	Female Mean deg.	S.D. deg.
6	21	6.1	3.0	6	12	6.5	4.7
7	22	5.9	2.8	7	14	7.2	3.6
8	23	5.4	2.9	8	18	6.3	3.7
9	24	5.4	3.4	9	15	6.4	2.9
10	25	5.4	2.7	10	14	6.1	3.9
11	25	5.3	3.2	11	13	5.6	5.0
12	24	4.5	4.2	12	13	6.4	4.0
13	23	4.0	3.6	13	9	6.2	3.3
14	20	4.7	4.1	14	9	5.3	3.4
15	17	3.9	4.5	15	7	6.0	2.5
16	13	3.1	3.6	16	5	4.8	2.9



**ANGULAR MEASUREMENT  
Variable 8**

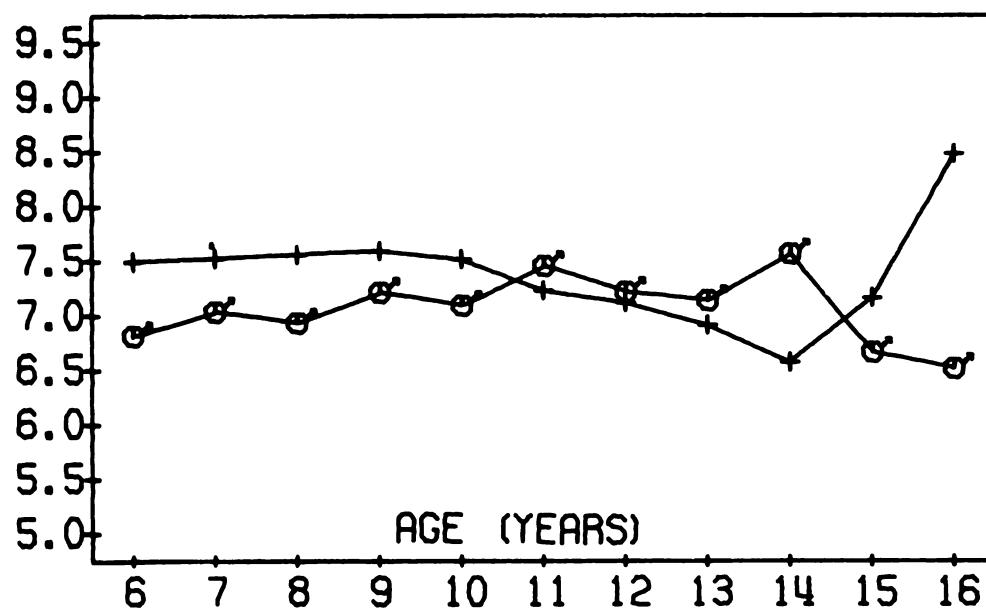


**Sella-Nasion/Condylar Plane**

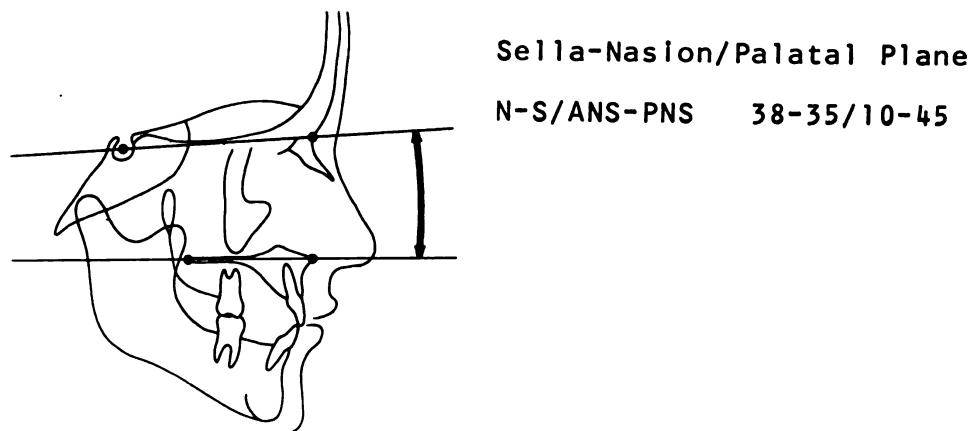
**N-S/OR-CO**

**38-35/40-33**

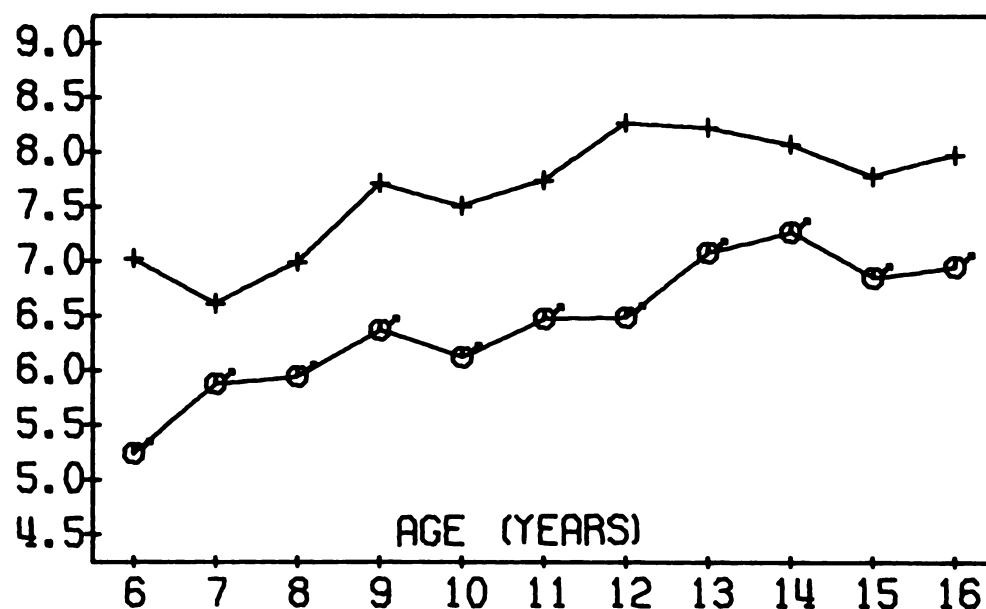
<b>Age</b>	<b>N</b>	<b>Male</b>		<b>Female</b>	
		<b>Mean</b>	<b>S.D.</b>	<b>Mean</b>	<b>S.D.</b>
6	37	6.8	2.2	6	25
7	44	7.0	2.4	7	31
8	44	6.9	2.4	8	36
9	46	7.2	2.6	9	31
10	45	7.1	2.2	10	35
11	43	7.5	2.4	11	30
12	44	7.2	2.8	12	27
13	42	7.1	2.8	13	29
14	40	7.6	2.7	14	25
15	33	6.7	2.1	15	19
16	23	6.5	2.6	16	9



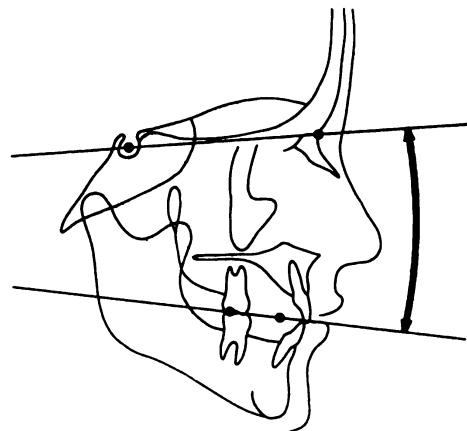
**ANGULAR MEASUREMENT  
Variable 9**



Age	N	Male		S.D. deg.	**	Age	N	Female	
		Mean deg.	S.D. deg.					Mean deg.	S.D. deg.
6	37	5.2	2.4			6	24	7.0	2.6
7	44	5.9	2.8			7	31	6.6	2.3
8	44	5.9	2.6			8	36	7.0	2.5
9	47	6.4	2.3			9	31	7.7	2.3
10	46	6.1	2.6	*		10	35	7.5	2.8
11	43	6.5	3.0			11	30	7.7	2.7
12	44	6.5	3.0	**		12	27	8.3	2.4
13	43	7.1	3.2			13	29	8.2	2.9
14	39	7.3	3.5			14	25	8.1	1.8
15	33	6.9	3.4			15	19	7.8	2.4
16	23	7.0	3.0			16	9	8.0	2.2



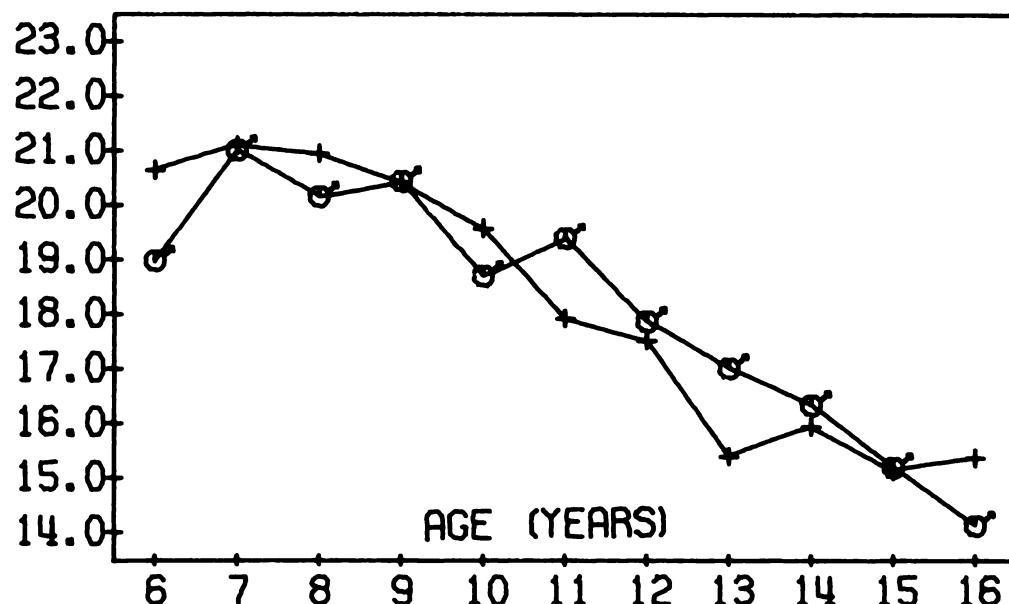
ANGULAR MEASUREMENT  
Variable 10



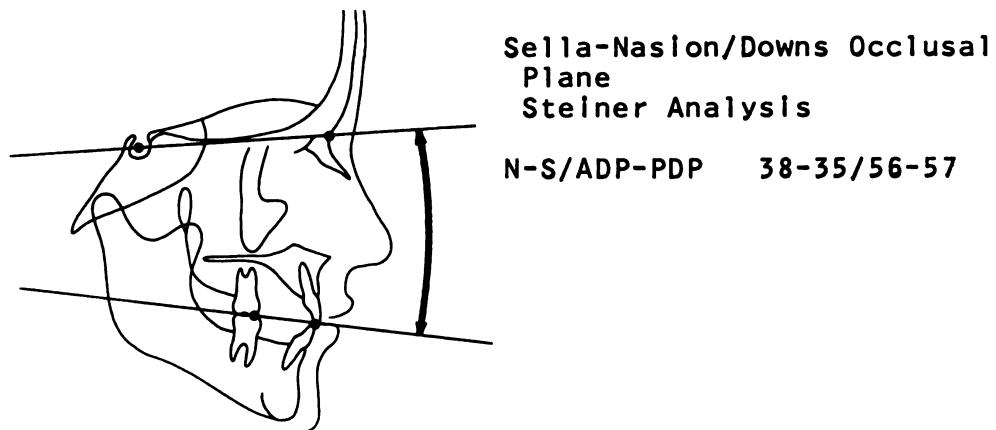
Sella-Nasion/Functional  
Occlusal Plane

N-S/PMC-FPP 38-35/46-50

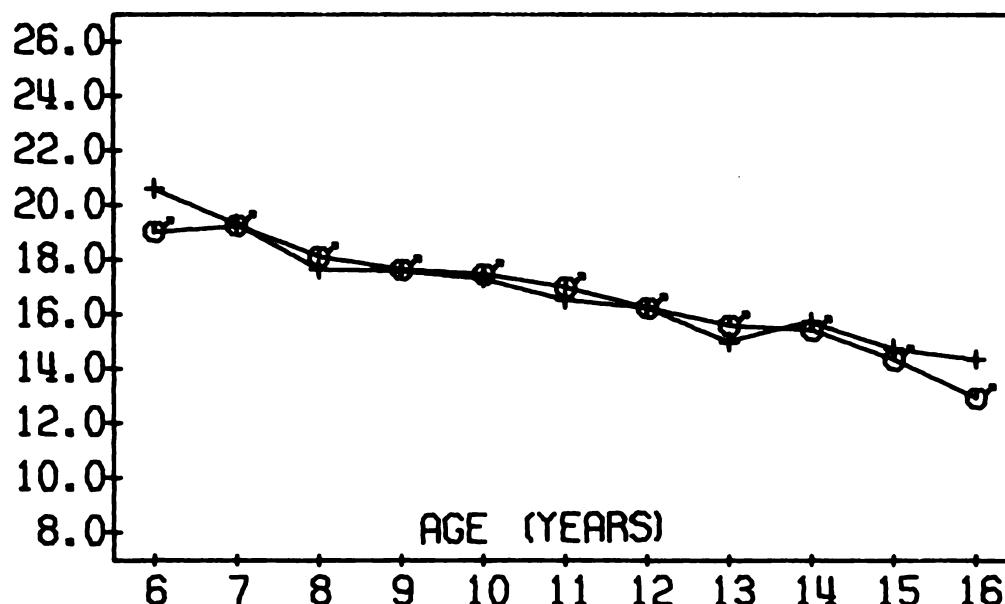
Age	N	Male		Female	
		Mean deg.	S.D. deg.	Mean deg.	S.D. deg.
6	36	19.0	4.7	20.6	5.1
7	43	21.0	4.1	21.1	4.3
8	44	20.2	4.2	21.0	4.0
9	47	20.4	3.2	20.4	4.1
10	46	18.7	4.0	19.6	4.2
11	43	19.4	3.9	17.9	4.5
12	44	17.9	3.9	17.5	3.7
13	42	17.0	3.7	15.4	4.1
14	39	16.3	3.7	15.9	4.1
15	32	15.2	3.4	15.1	4.1
16	23	14.1	3.9	15.4	3.1



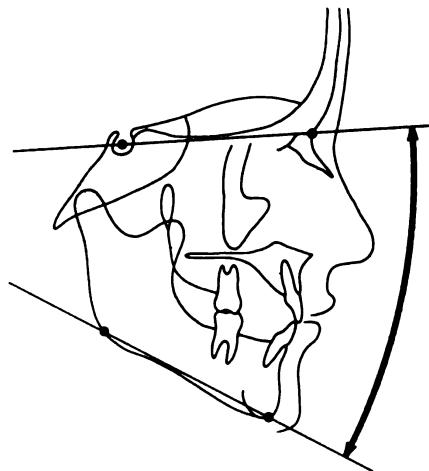
**ANGULAR MEASUREMENT  
Variable 11**



Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	19.0	4.6	6	25	20.6	4.8
7	44	19.2	4.4	7	31	19.3	3.9
8	44	18.1	3.4	8	36	17.7	3.5
9	47	17.6	3.3	9	31	17.6	3.1
10	46	17.5	3.2	10	35	17.3	3.5
11	43	17.0	3.8	11	30	16.5	3.6
12	44	16.2	3.7	12	27	16.3	3.3
13	43	15.6	3.8	13	29	15.0	4.0
14	40	15.4	3.9	14	25	15.7	4.0
15	33	14.3	3.8	15	19	14.7	3.8
16	23	12.9	4.1	16	9	14.4	2.5



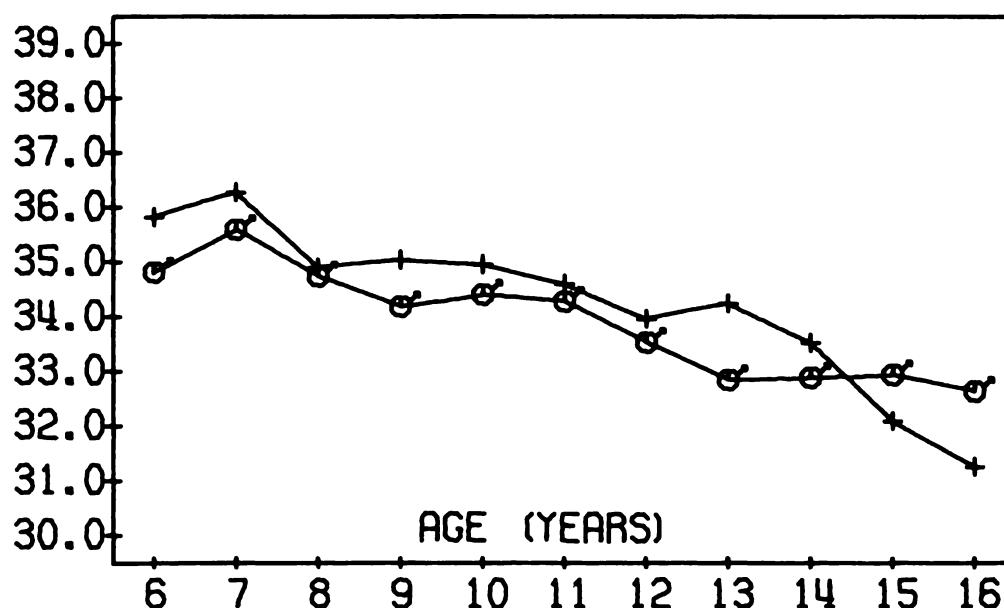
ANGULAR MEASUREMENT  
Variable 12



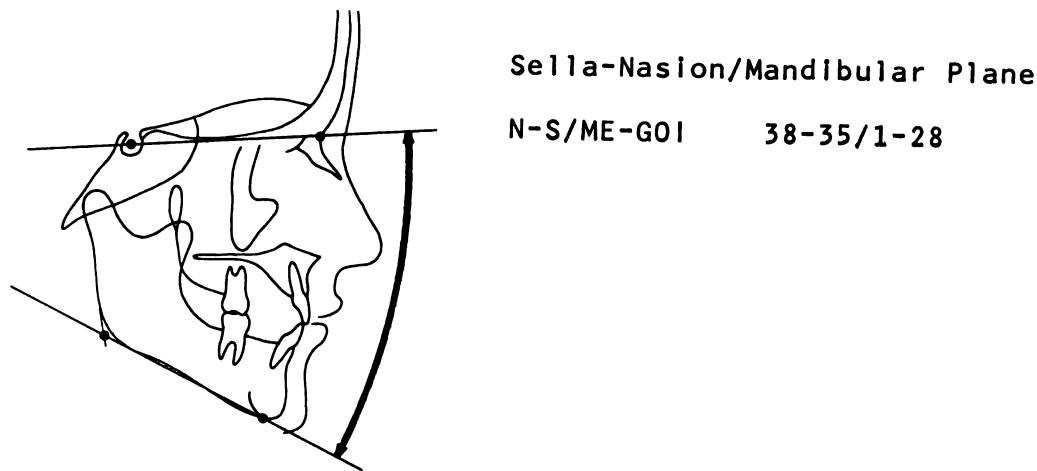
Sella-Nasion/Gonion-Gnathion  
Steiner Analysis

N-S/GN-GO      38-35/2-27

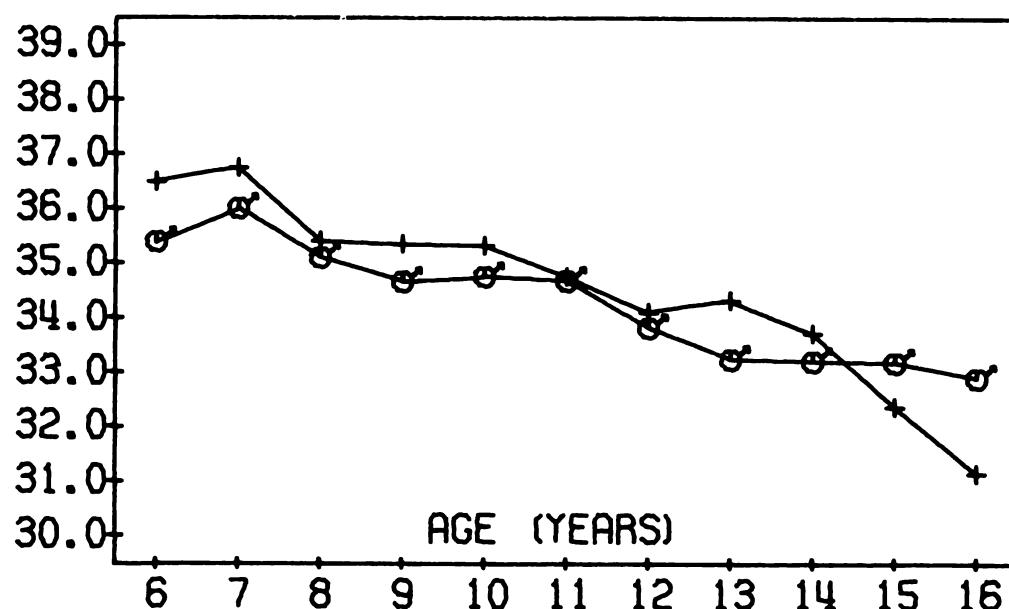
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	34.8	3.8	6	25	35.8	5.5
7	44	35.6	4.8	7	31	36.3	4.6
8	44	34.7	4.4	8	36	34.9	4.8
9	46	34.2	4.4	9	31	35.0	5.1
10	45	34.4	4.5	10	35	35.0	4.8
11	43	34.3	4.5	11	30	34.6	5.3
12	44	33.5	4.8	12	27	34.0	5.1
13	43	32.9	4.8	13	29	34.2	5.4
14	40	32.9	5.0	14	25	33.5	6.0
15	33	32.9	5.0	15	19	32.1	5.5
16	23	32.6	5.2	16	9	31.3	3.1



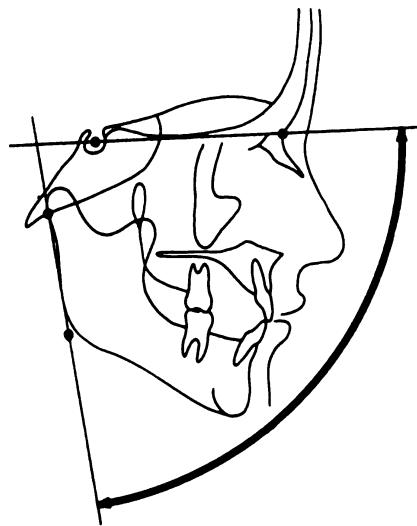
**ANGULAR MEASUREMENT  
Variable 13**



Age	N	Male		Female	
		Mean deg.	S.D. deg.	Mean deg.	S.D. deg.
6	37	35.4	4.0	25	36.5
7	44	36.0	4.9	31	36.7
8	44	35.1	4.5	36	35.4
9	46	34.7	4.6	31	35.3
10	45	34.7	4.7	35	35.3
11	43	34.7	4.7	30	34.8
12	44	33.8	4.9	27	34.1
13	42	33.2	5.0	29	34.3
14	39	33.2	5.1	25	33.7
15	32	33.2	5.2	19	32.4
16	23	32.9	5.2	9	31.2



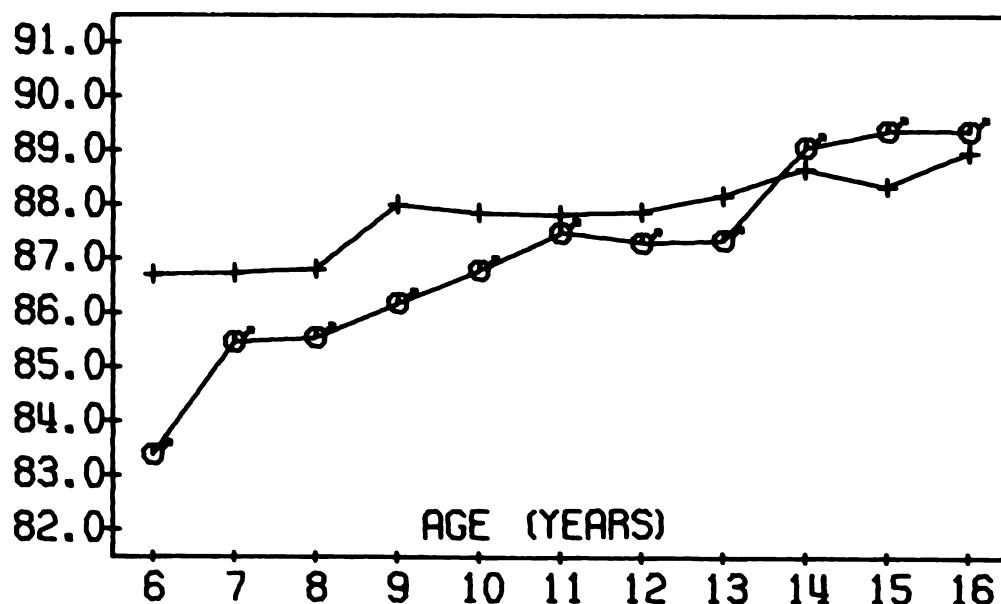
ANGULAR MEASUREMENT  
Variable 14



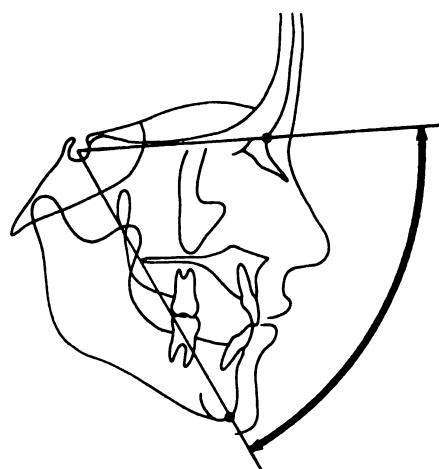
Sella-Nasion/Gonial Inter-  
section-Articulare, Posterior

N-S/GO1-AR      38-35/28-31

Age	N	Male		S.D. deg.	Age	N	Female	
		Mean deg.	S.D. deg.				Mean deg.	S.D. deg.
6	37	83.4	3.8	*	6	25	86.7	4.2
7	44	85.5	4.2		7	31	86.7	4.4
8	44	85.6	4.2		8	36	86.8	4.5
9	46	86.2	4.0		9	31	88.0	4.9
10	45	86.8	3.6		10	35	87.9	4.7
11	43	87.5	4.4		11	30	87.8	5.1
12	44	87.3	3.9		12	27	87.9	4.4
13	43	87.4	4.2		13	29	88.2	5.2
14	40	89.1	4.3		14	25	88.7	5.5
15	32	89.4	4.6		15	19	88.3	6.3
16	23	89.4	4.5		16	9	89.0	4.3

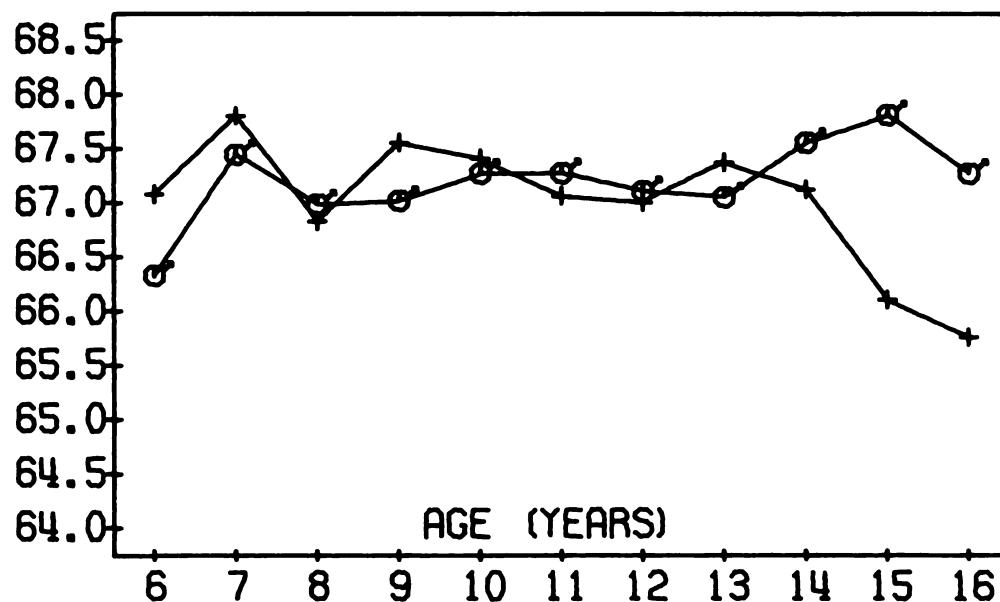


ANGULAR MEASUREMENT  
Variable 15

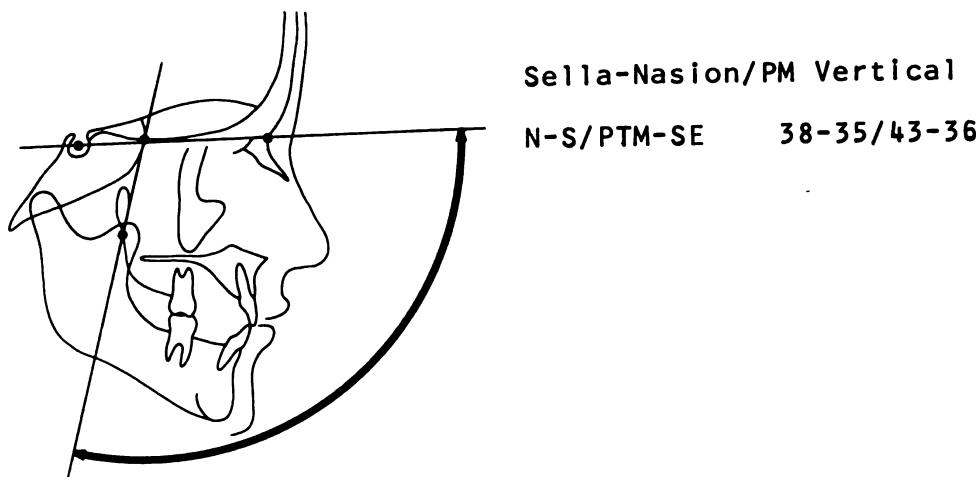


Nasion-Sella-Gnathion  
N-S-GN      38-35-2

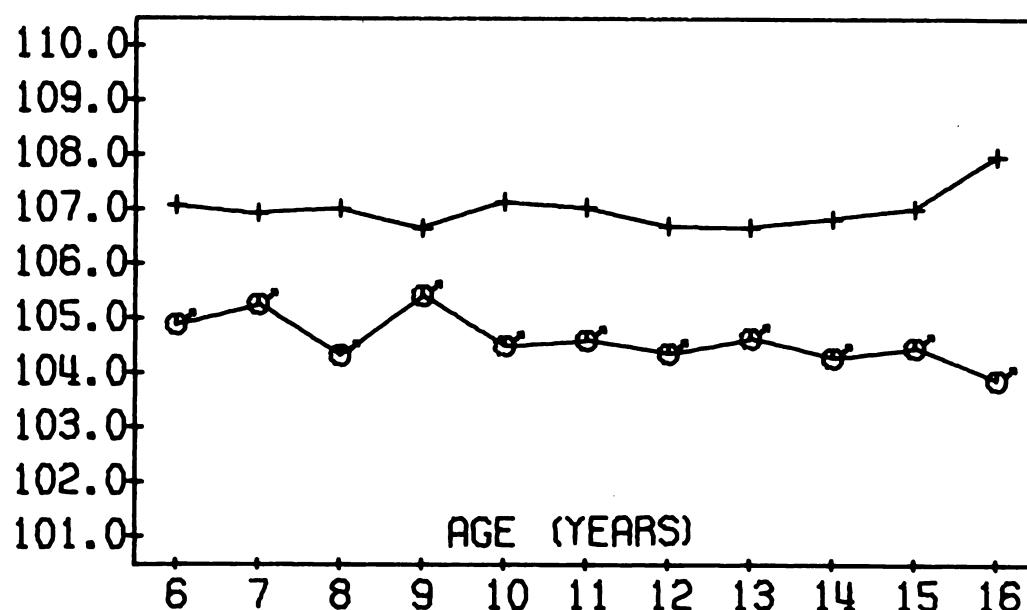
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	66.3	2.6	6	25	67.1	3.7
7	44	67.5	3.1	7	31	67.8	3.1
8	44	67.0	3.1	8	36	66.8	3.7
9	46	67.0	3.0	9	31	67.6	3.8
10	45	67.3	2.9	10	35	67.4	3.9
11	43	67.3	2.9	11	30	67.1	4.1
12	44	67.1	3.0	12	27	67.0	3.5
13	43	67.1	3.1	13	29	67.4	4.4
14	40	67.6	3.5	14	25	67.1	4.4
15	33	67.8	3.4	15	19	66.1	4.4
16	23	67.3	3.9	16	9	65.8	3.5



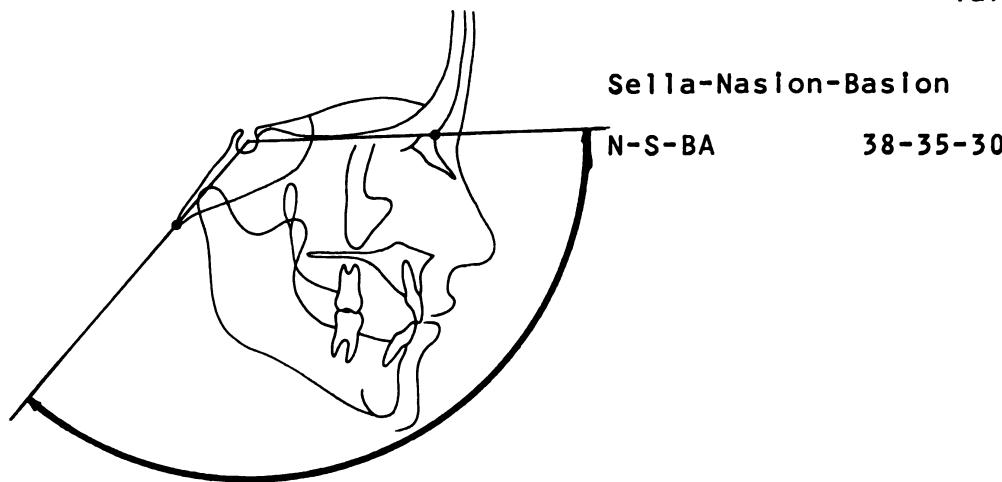
ANGULAR MEASUREMENT  
Variable 16



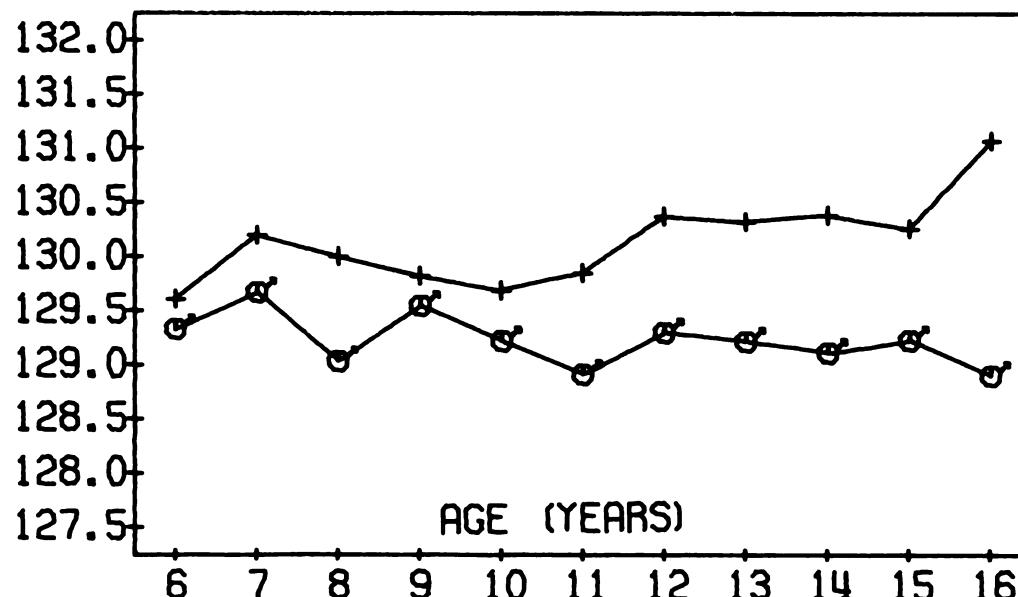
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	104.9	4.3	*	6	25	107.1
7	44	105.3	3.7		7	31	106.9
8	44	104.3	3.8	**	8	36	107.0
9	47	105.4	3.5		9	31	106.7
10	46	104.5	3.6	**	10	35	107.1
11	43	104.6	3.3	**	11	30	107.0
12	44	104.4	4.2	*	12	27	106.7
13	43	104.6	4.1		13	29	106.7
14	40	104.3	4.3	*	14	25	106.8
15	33	104.5	4.8		15	19	107.0
16	23	103.9	5.1		16	9	108.0



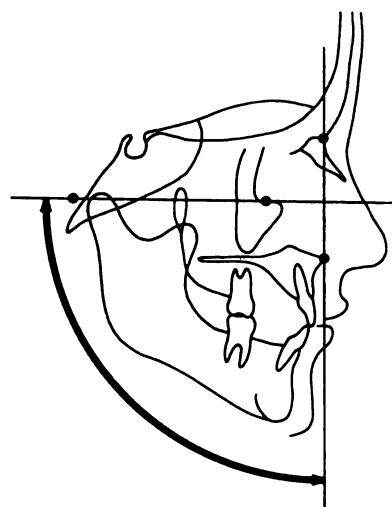
**ANGULAR MEASUREMENT  
Variable 17**



Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	129.3	5.0	6	25	129.6	5.0
7	44	129.7	4.9	7	31	130.2	4.6
8	44	129.0	4.8	8	36	130.0	4.8
9	47	129.6	4.6	9	31	129.8	4.6
10	46	129.2	4.7	10	35	129.7	4.5
11	43	128.9	4.8	11	30	129.9	4.8
12	44	129.3	4.8	12	27	130.4	5.2
13	43	129.2	5.3	13	29	130.3	4.7
14	40	129.1	5.2	14	25	130.4	4.8
15	33	129.2	5.4	15	19	130.3	4.0
16	23	128.9	5.9	16	9	131.1	4.1



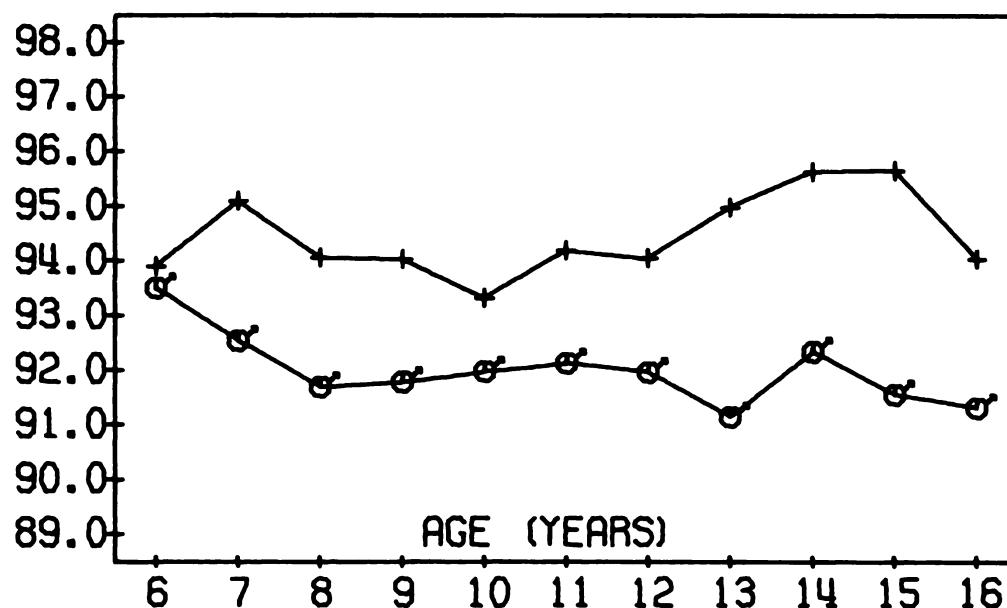
ANGULAR MEASUREMENT  
Variable 18



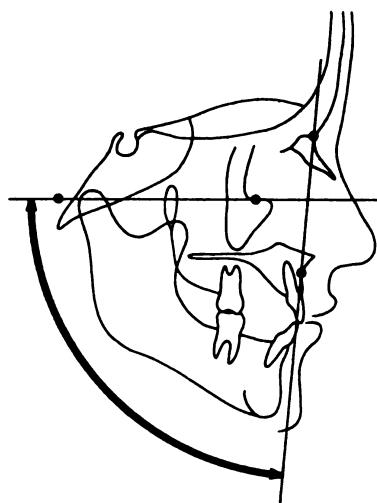
Frankfort Plane/Anterior Nasal  
Spine-Nasion

ANS-N/PO-OR 10-38/49-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	93.5	3.2	6	12	93.9	3.9
7	22	92.5	2.9	7	14	95.1	3.6
8	23	91.7	3.0	8	18	94.1	3.4
9	24	91.8	3.8	9	15	94.0	3.0
10	25	92.0	3.8	10	14	93.3	4.1
11	25	92.1	3.1	11	13	94.2	3.9
12	24	92.0	4.3	12	13	94.0	2.7
13	23	91.1	3.6	13	9	95.0	2.2
14	20	92.3	3.2	14	9	95.6	3.6
15	17	91.6	4.3	15	7	95.7	3.7
16	13	91.3	3.9	16	5	94.0	3.8



ANGULAR MEASUREMENT  
Variable 19

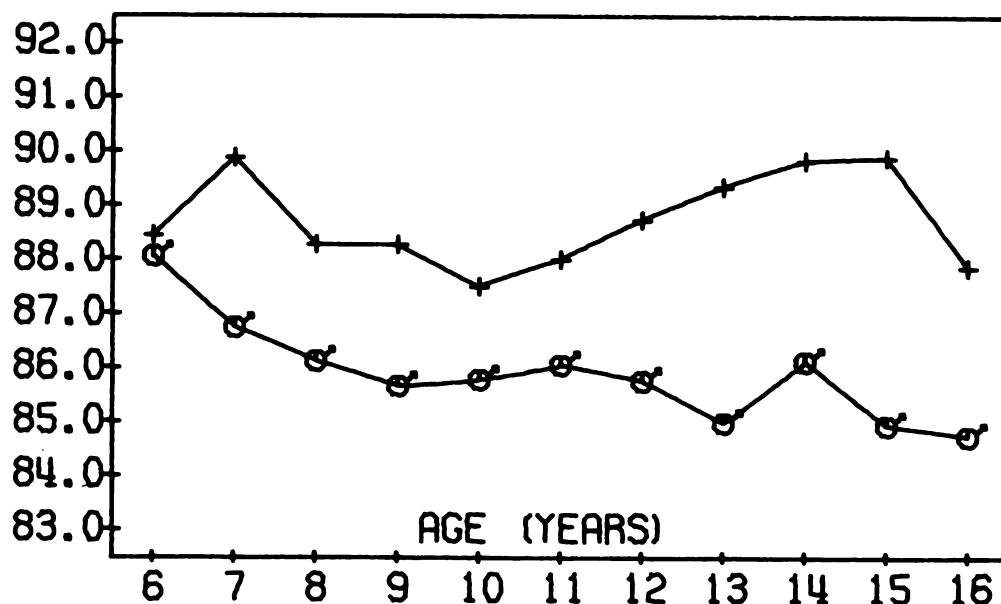


Frankfort Plane/Nasion-A Point

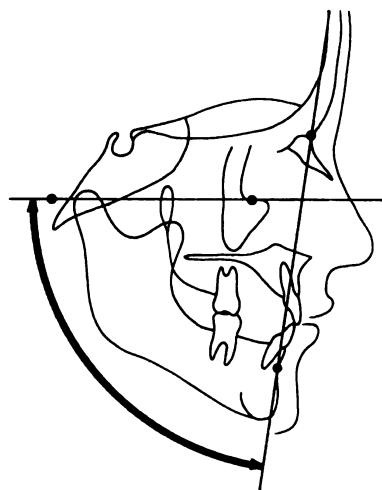
A-N/PO-OR

9-38/49-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	88.1	3.2	6	12	88.4	3.4
7	22	86.7	3.1	7	14	89.9	3.3
8	23	86.1	3.2	8	18	88.3	3.4
9	24	85.7	3.5	9	15	88.3	3.1
10	25	85.8	3.5	10	14	87.5	3.8
11	25	86.0	3.4	11	13	88.0	3.5
12	24	85.8	4.2	12	13	88.7	2.4
13	23	85.0	3.8	13	9	89.3	1.8
14	20	86.1	3.5	14	9	89.8	3.5
15	17	84.9	4.7	15	7	89.9	3.6
16	13	84.7	3.8	16	5	87.9	3.6

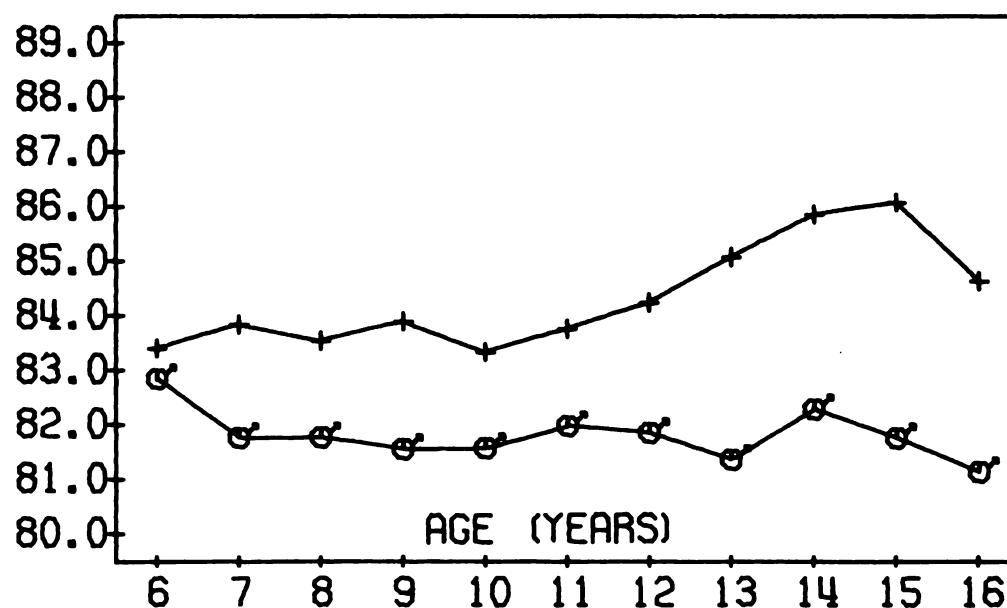


ANGULAR MEASUREMENT  
Variable 20

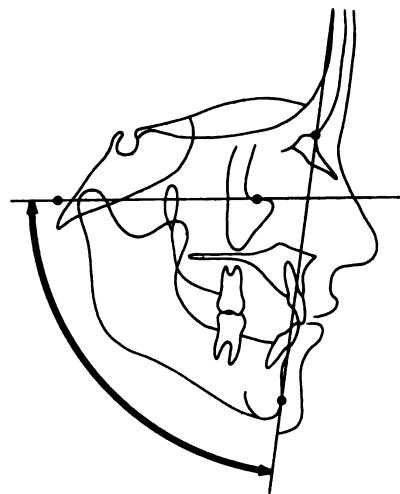


Frankfort Plane/Nasion-B Point  
B-N/PO-OR      4-38/49-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	82.8	3.1	6	12	83.4	3.0
7	22	81.8	3.3	7	14	83.8	3.2
8	23	81.8	3.1	8	18	83.5	2.6
9	23	81.6	3.6	9	15	83.9	3.0
10	24	81.6	3.4	10	14	83.3	3.4
11	25	82.0	3.4	11	13	83.8	2.5
12	24	81.9	3.9	12	13	84.2	2.6
13	23	81.4	3.5	13	9	85.1	1.7
14	20	82.3	3.6	14	9	85.9	3.2
15	17	81.8	4.5	15	7	86.1	2.8
16	13	81.1	3.8	16	5	84.6	2.1



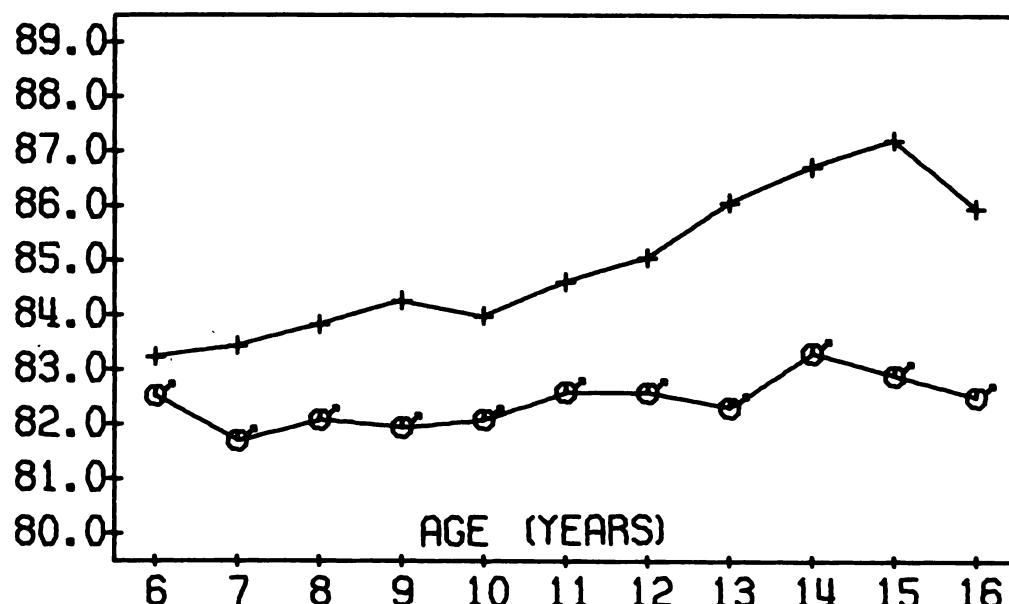
ANGULAR MEASUREMENT  
Variable 21



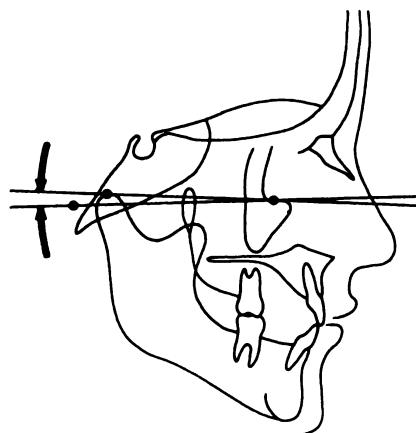
Frankfort Plane/Nasion-Pogonion  
Ricketts Analysis

PG-N/PO-OR      3-38/49-40

Age	N	Male		Age	N	Female		
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.	
6	21	82.5	3.1	6	12	83.2	3.2	
7	22	81.7	3.4	7	14	83.4	3.1	
8	23	82.1	3.3	8	18	83.8	2.8	
9	23	81.9	3.6	*	9	15	84.3	3.0
10	24	82.1	3.4	10	14	84.0	3.5	
11	25	82.6	3.5	11	13	84.6	2.7	
12	24	82.6	3.8	12	13	85.0	3.0	
13	23	82.3	3.4	**	13	9	86.1	1.9
14	20	83.3	3.7	*	14	9	86.7	3.7
15	17	82.9	4.5	*	15	7	87.2	3.0
16	13	82.5	3.9	*	16	5	86.0	2.5



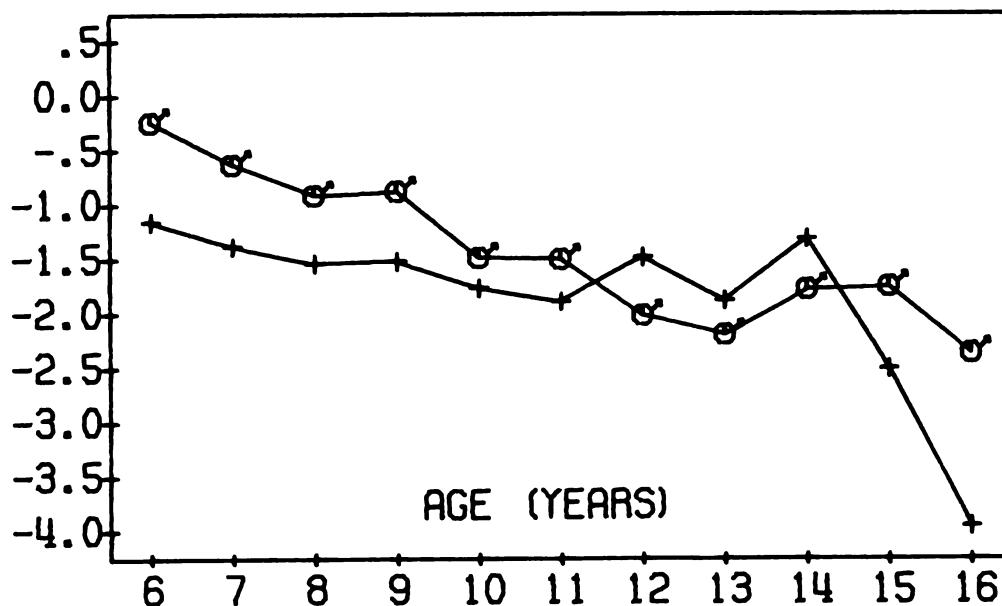
ANGULAR MEASUREMENT  
Variable 22



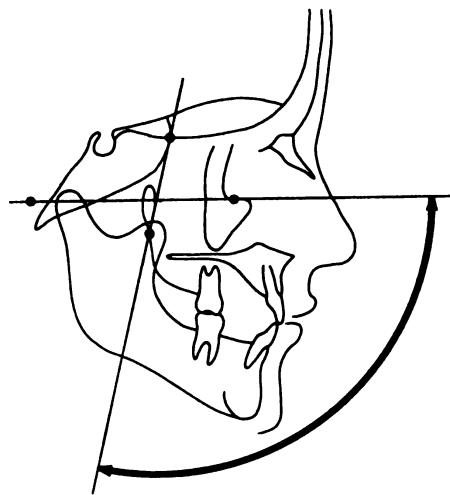
Frankfort Plane/Condylar Plane

CO-OR/PO-OR 33-40/49-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	-0.2	2.0	6	12	-1.1	2.6
7	22	-0.6	3.0	7	14	-1.4	1.3
8	23	-0.9	2.1	8	18	-1.5	3.5
9	23	-0.9	2.6	9	15	-1.5	2.7
10	24	-1.5	1.9	10	14	-1.8	2.2
11	25	-1.5	2.4	11	13	-1.9	2.9
12	24	-2.0	3.2	12	13	-1.5	2.8
13	23	-2.2	2.3	13	9	-1.9	2.8
14	20	-1.8	2.9	14	9	-1.3	2.8
15	17	-1.7	2.7	15	7	-2.5	1.8
16	13	-2.4	1.8	16	5	-3.9	3.0



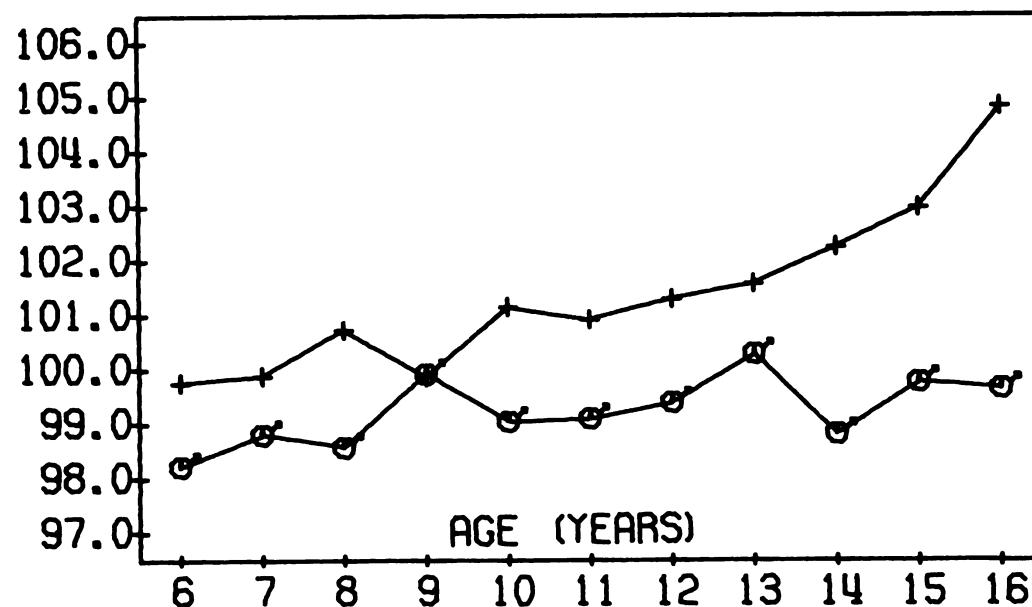
ANGULAR MEASUREMENT  
Variable 23



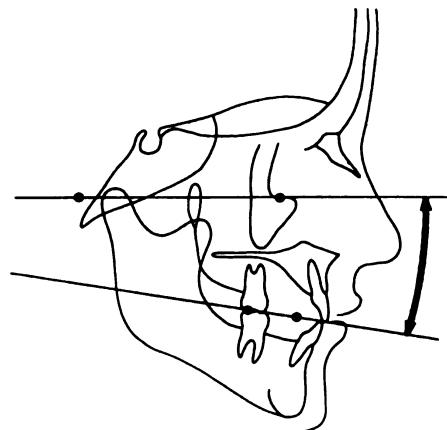
Frankfort Plane/PM Vertical

OR-PO/PTM-SE 40-49/43-36

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	98.2	3.9	6	12	99.8	3.9
7	22	98.8	3.8	7	14	99.9	4.8
8	23	98.6	3.6	8	18	100.7	4.8
9	24	99.9	3.6	9	15	99.9	3.7
10	25	99.0	4.3	10	14	101.1	5.6
11	25	99.1	4.0	11	13	100.9	5.4
12	24	99.4	5.2	12	13	101.3	5.3
13	23	100.3	5.1	13	9	101.6	5.2
14	20	98.8	4.3	14	9	102.2	5.4
15	17	99.8	5.2	15	7	103.0	6.6
16	13	99.7	4.5	*	16	5	104.8



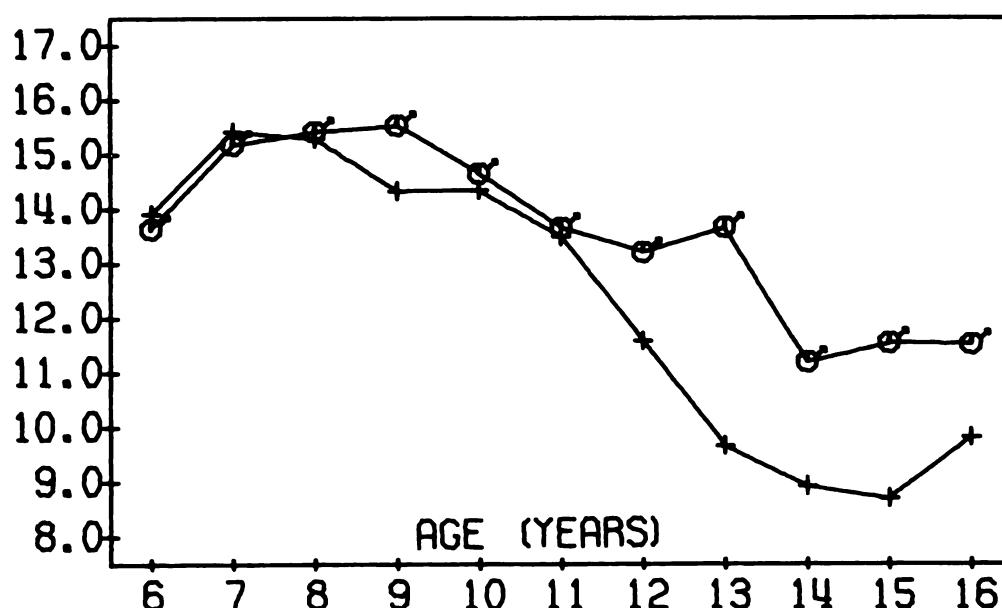
ANGULAR MEASUREMENT  
Variable 24



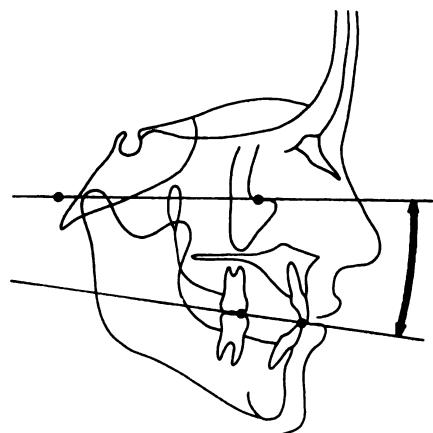
Frankfort Plane/Functional  
Occlusal Plane

OR-PO/PMC-FPP 40-49/46-50

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	20	13.6	5.5	6	12	13.9	5.3
7	21	15.2	4.4	7	14	15.4	5.8
8	23	15.4	4.0	8	18	15.3	4.0
9	24	15.5	4.4	9	14	14.3	4.5
10	25	14.6	4.3	10	14	14.4	4.5
11	25	13.7	3.9	11	13	13.5	3.5
12	24	13.2	5.3	12	13	11.6	3.6
13	23	13.7	4.6	13	9	9.7	3.8
14	20	11.2	4.0	14	9	8.9	4.7
15	17	11.5	4.9	15	7	8.7	2.4
16	13	11.5	2.6	16	5	9.8	2.8



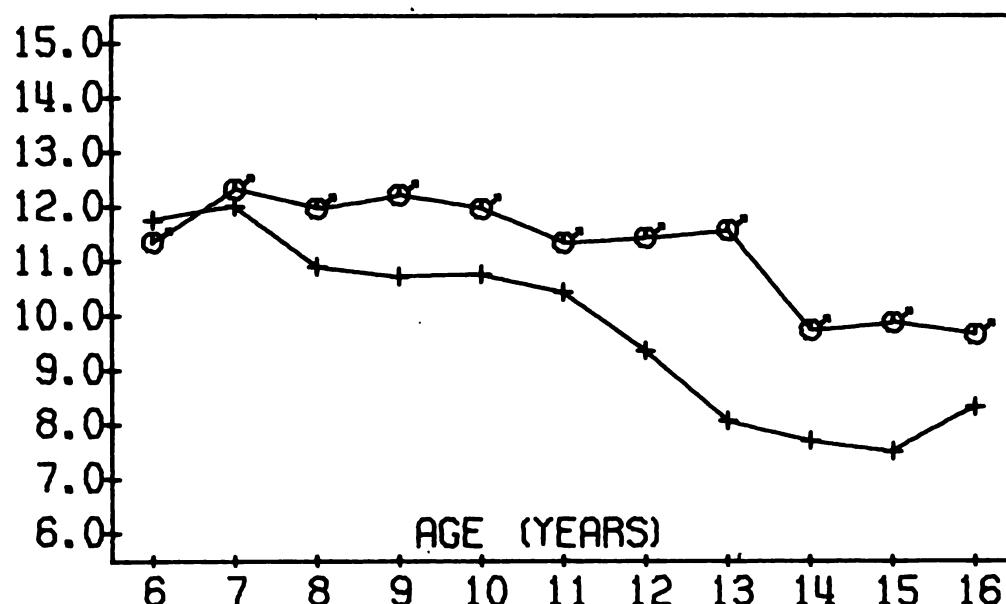
**ANGULAR MEASUREMENT  
Variable 25**



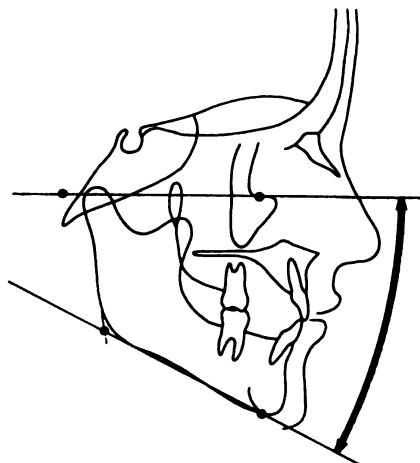
**Frankfort Plane/Downs Occlusal  
Plane  
Downs Analysis**

**OR-PO/ADP-PDP 40-49/56-57**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	11.4	3.6	6	12	11.8	5.0
7	22	12.3	3.9	7	14	12.0	4.0
8	23	12.0	3.4	8	18	10.9	3.6
9	24	12.2	4.4	9	15	10.7	3.6
10	25	12.0	3.7	10	14	10.8	3.7
11	25	11.3	3.6	11	13	10.4	2.9
12	24	11.4	4.8	12	13	9.4	3.0
13	23	11.6	4.3	* 13	9	8.1	2.4
14	20	9.7	4.1	14	9	7.7	3.5
15	17	9.9	5.0	15	7	7.5	1.8
16	13	9.7	3.5	16	5	8.3	1.5



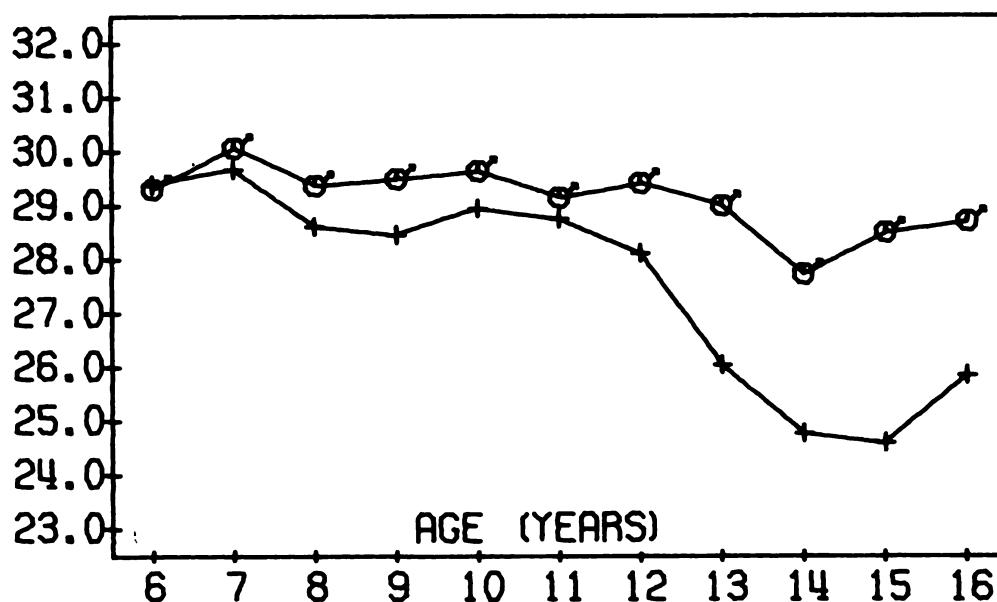
ANGULAR MEASUREMENT  
Variable 26



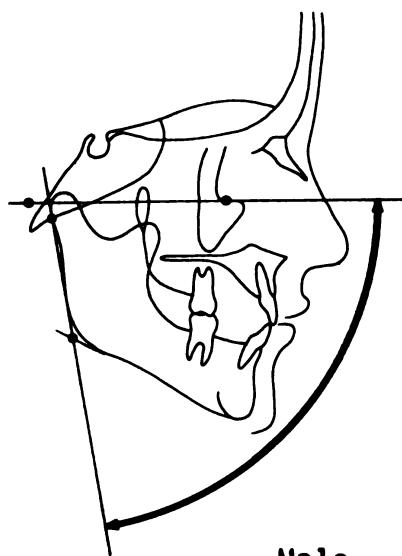
Frankfort Plane/Mandibular  
Plane  
Downs Analysis/Tweed Analysis

OR-PO/ME-GOI      40-49/1-28

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	29.3	3.9	6	12	29.4	4.5
7	22	30.1	5.9	7	14	29.7	3.7
8	23	29.4	4.8	8	18	28.6	3.8
9	23	29.5	5.5	9	15	28.4	4.9
10	24	29.6	5.0	10	14	28.9	4.2
11	25	29.1	4.7	11	13	28.8	4.4
12	24	29.4	5.5	12	13	28.1	5.2
13	23	29.0	5.1	13	9	26.0	4.3
14	20	27.7	5.8	14	9	24.8	5.8
15	17	28.5	6.2	15	7	24.6	4.1
16	13	28.7	5.2	16	5	25.8	3.0

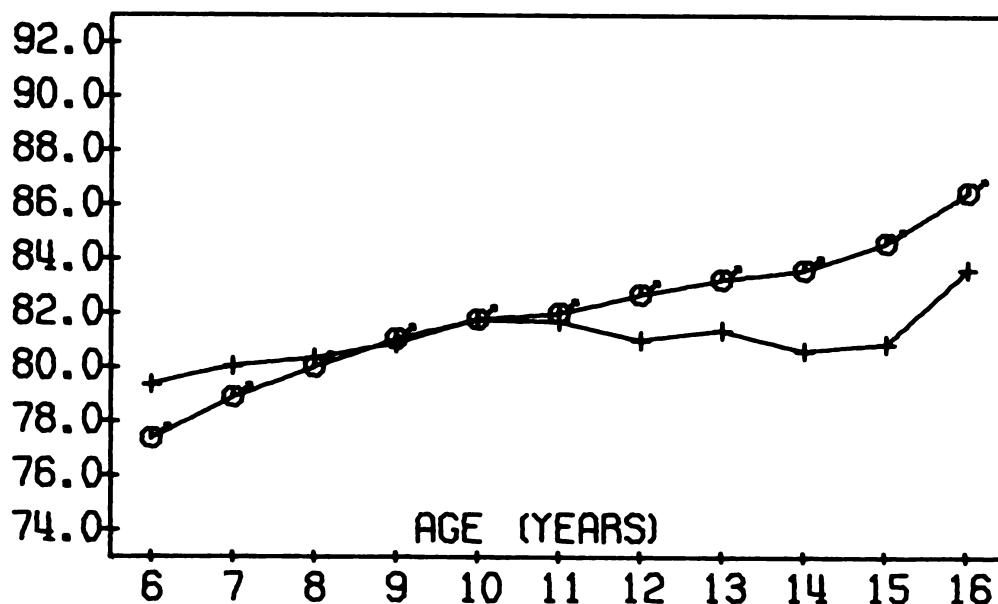


ANGULAR MEASUREMENT  
Variable 27

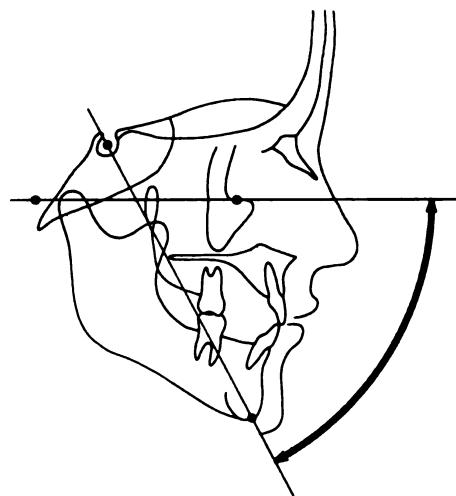


Frankfort Plane/Gonial Inter-  
section-Articulare Posterior  
OR-PO/GOI-AR 40-49/28-31

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	77.4	4.3	6	12	79.4	5.3
7	22	78.9	5.0	7	14	80.0	3.2
8	23	80.0	4.5	8	18	80.3	3.5
9	23	81.1	5.4	9	15	80.9	4.3
10	24	81.8	4.6	10	14	81.8	4.3
11	25	82.0	4.7	11	13	81.7	3.7
12	24	82.7	5.1	12	13	81.0	3.2
13	23	83.3	4.8	13	9	81.4	2.6
14	20	83.6	4.2	14	9	80.6	4.0
15	17	84.6	4.4	15	7	80.9	5.6
16	13	86.5	4.7	16	5	83.6	3.4



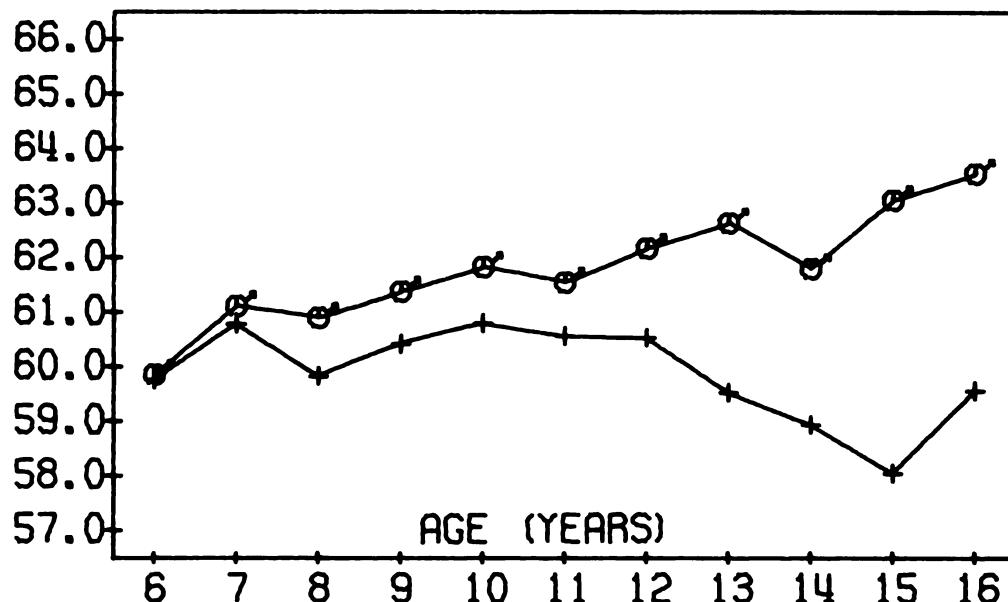
ANGULAR MEASUREMENT  
Variable 28



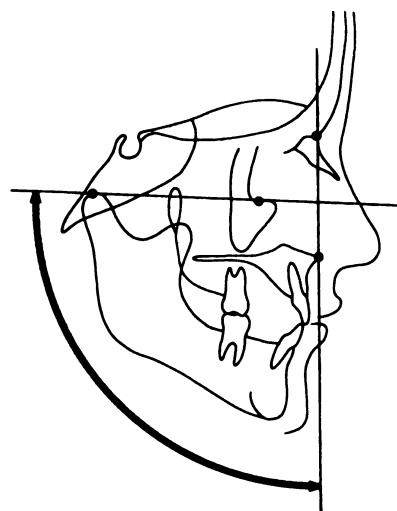
Frankfort Plane/Sella-Gnathion  
Downs Analysis

OR-PO/GN-S 40-49/2-35

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	59.9	3.6	6	12	59.8	3.9
7	22	61.1	4.5	7	14	60.8	3.8
8	23	60.9	3.9	8	18	59.8	3.1
9	23	61.4	4.3	9	15	60.4	3.5
10	24	61.8	3.9	10	14	60.8	4.2
11	25	61.6	3.9	11	13	60.6	3.7
12	24	62.2	4.5	12	13	60.5	3.8
13	23	62.6	3.9	13	9	59.5	2.1
14	20	61.8	4.5	14	9	58.9	3.8
15	17	63.1	5.0	15	7	58.0	3.4
16	13	63.5	3.8	*	5	59.6	2.6



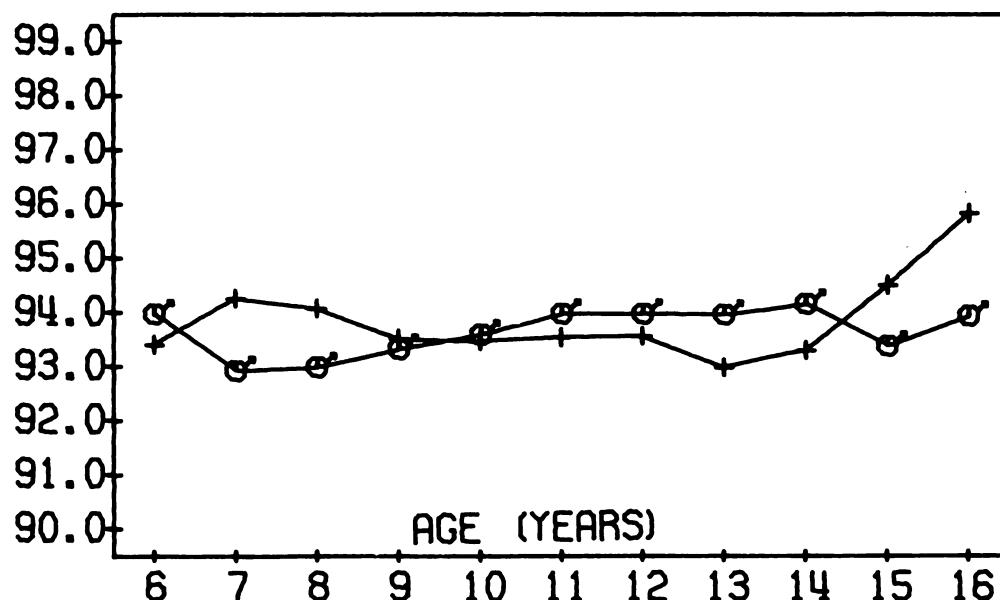
**ANGULAR MEASUREMENT**  
**Variable 29**



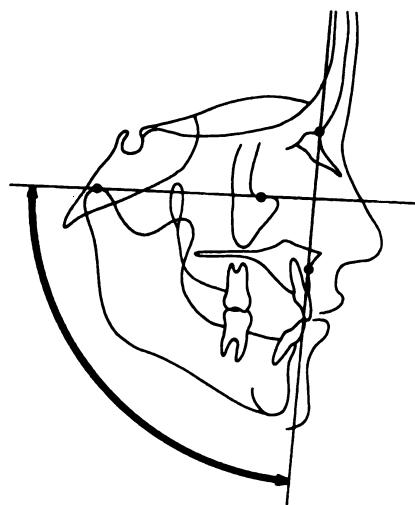
Condylar Plane/Nasion-Anterior Nasal Spine

ANS-N/CO-OR

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	94.0	4.1	6	25	93.4	4.0
7	44	92.9	2.9	7	31	94.3	4.5
8	44	93.0	3.9	8	36	94.1	4.1
9	46	93.3	3.8	9	31	93.5	3.8
10	45	93.6	4.0	10	35	93.5	4.2
11	43	94.0	3.0	11	30	93.5	4.7
12	44	94.0	3.7	12	27	93.6	4.2
13	42	94.0	3.7	13	29	93.0	4.5
14	40	94.2	3.6	14	25	93.3	4.2
15	33	93.4	3.3	15	19	94.5	3.9
16	23	93.9	4.2	16	9	95.8	3.8



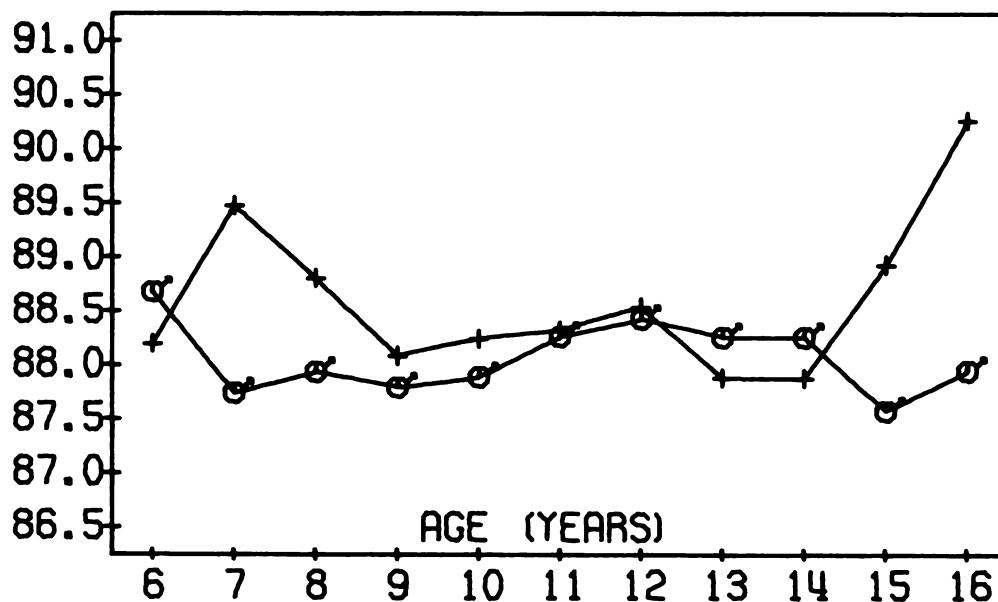
ANGULAR MEASUREMENT  
Variable 30



Condylar Plane/Nasion-A Point

A-N/CO-OR      9-38/33-40

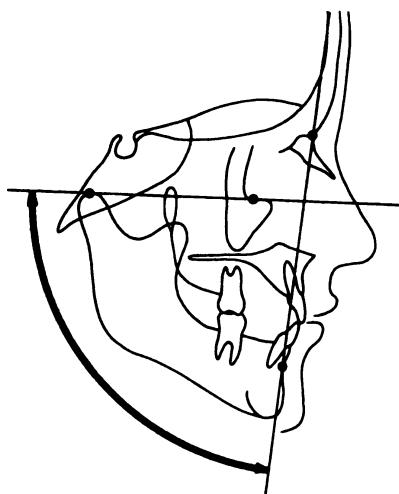
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	88.7	3.6	*	6	25	88.2
7	44	87.7	2.9	7	31	89.5	3.9
8	44	87.9	3.7	8	36	88.8	3.9
9	46	87.8	3.7	9	31	88.1	3.8
10	45	87.9	3.8	10	35	88.2	4.0
11	43	88.3	3.2	11	30	88.3	3.9
12	44	88.4	3.5	12	27	88.5	3.8
13	42	88.3	3.9	13	29	87.9	4.3
14	40	88.3	3.5	14	25	87.9	3.7
15	33	87.6	3.5	15	19	88.9	3.5
16	23	87.9	4.4	16	9	90.3	3.3



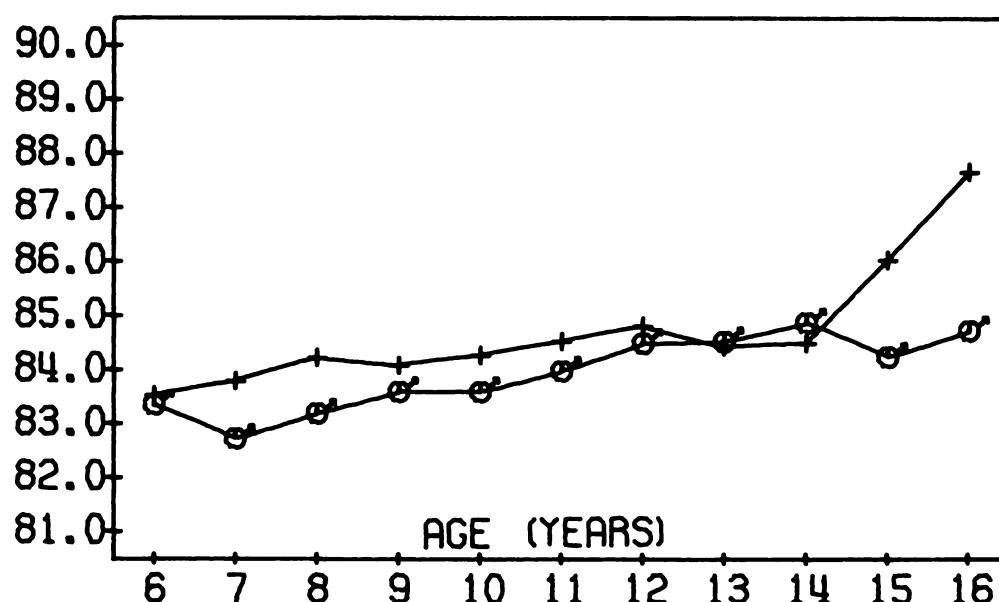
ANGULAR MEASUREMENT  
Variable 31

Condylar Plane/Nasion-B Point

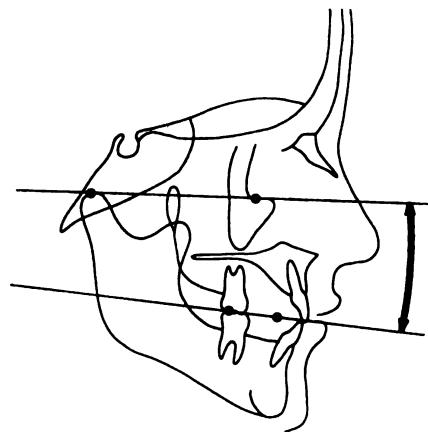
B-N/CO-OR 4-38/33-40



Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	83.3	3.0	6	25	83.5	3.0
7	44	82.7	3.0	7	31	83.8	3.1
8	44	83.2	3.3	8	36	84.2	2.9
9	46	83.6	3.1	9	31	84.1	3.0
10	45	83.6	3.4	10	35	84.3	3.1
11	43	84.0	3.0	11	30	84.5	3.4
12	44	84.5	3.3	12	27	84.8	3.0
13	42	84.5	3.5	13	29	84.4	3.9
14	40	84.9	3.5	14	25	84.5	3.3
15	33	84.2	3.1	15	19	86.0	3.3
16	23	84.7	3.7	*	16	9	87.7



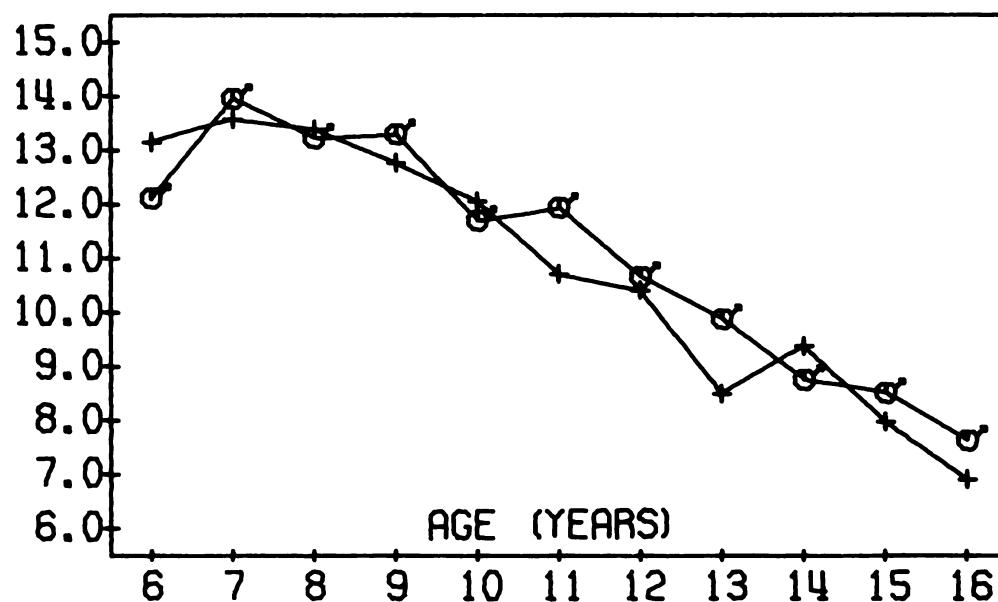
ANGULAR MEASUREMENT  
Variable 32



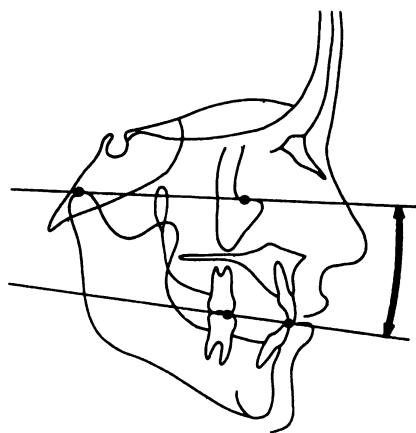
Condylar Plane/Functional  
Occlusal Plane

OR-CO/PMC-FPP 40-33/46-50

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	36	12.1	4.8	6	25	13.1	4.6
7	43	14.0	4.4	7	31	13.6	4.5
8	44	13.2	4.3	8	36	13.4	3.1
9	46	13.3	3.5	9	30	12.8	3.3
10	45	11.7	4.5	10	35	12.1	3.6
11	43	11.9	3.7	11	30	10.7	3.4
12	44	10.7	4.1	12	27	10.4	3.3
13	42	9.9	4.4	13	29	8.5	4.2
14	39	8.8	3.9	14	25	9.4	3.8
15	32	8.5	3.9	15	19	8.0	4.2
16	23	7.6	3.8	16	9	6.9	3.7



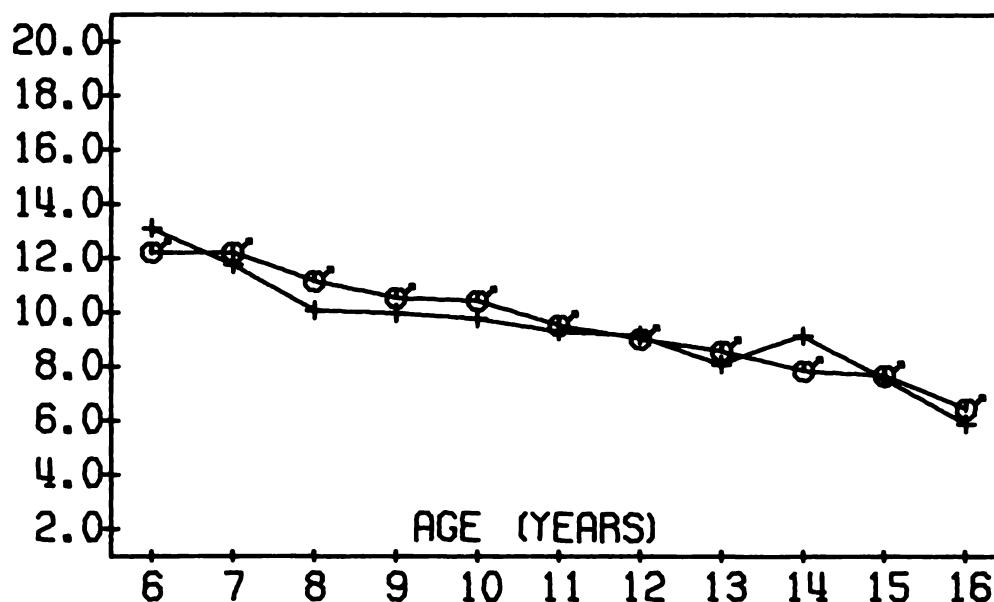
ANGULAR MEASUREMENT  
Variable 33

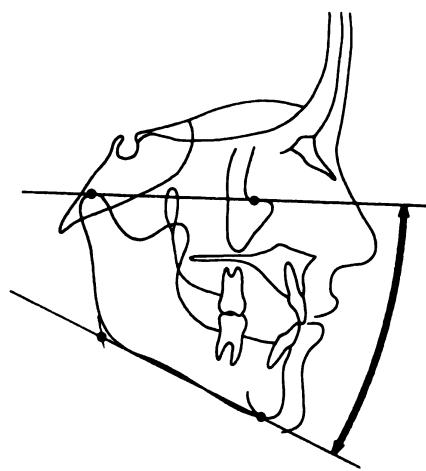


Condylar Plane/Downs Occlusal  
Plane

OR-CO/ADP-PDP 40-33/56-57

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	12.2	4.1	6	25	13.1	5.2
7	44	12.2	4.5	7	31	11.8	4.4
8	44	11.2	3.6	8	36	10.1	3.5
9	46	10.6	3.5	9	31	10.0	3.4
10	45	10.5	3.8	10	35	9.8	3.4
11	43	9.5	3.7	11	30	9.3	3.3
12	44	9.0	3.7	12	27	9.1	3.2
13	42	8.6	4.3	13	29	8.1	4.3
14	40	7.9	4.3	14	25	9.2	3.9
15	33	7.7	3.8	15	19	7.6	3.7
16	23	6.4	3.8	16	9	5.9	3.2



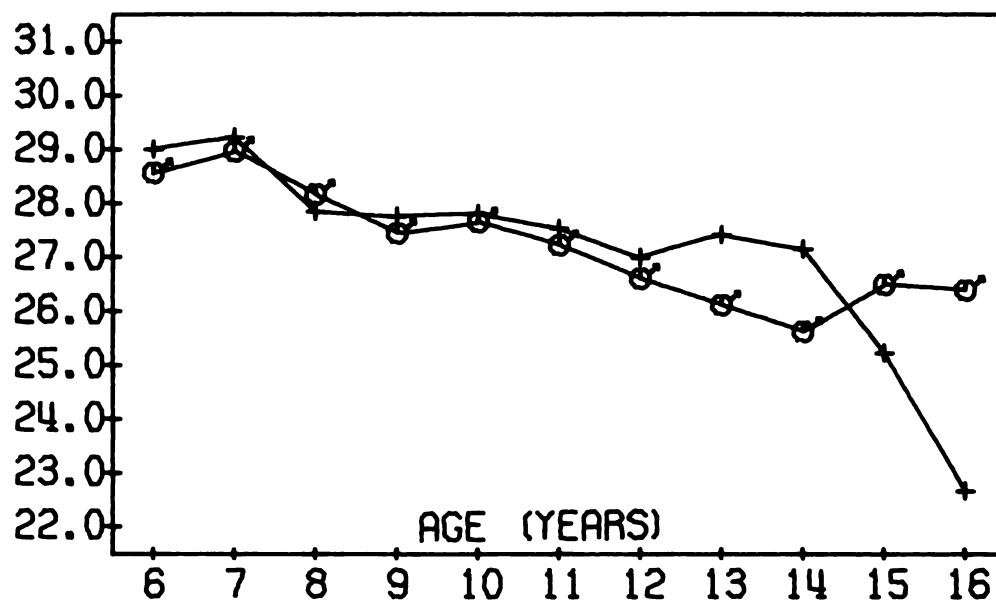


**ANGULAR MEASUREMENT**  
**Variable 34**

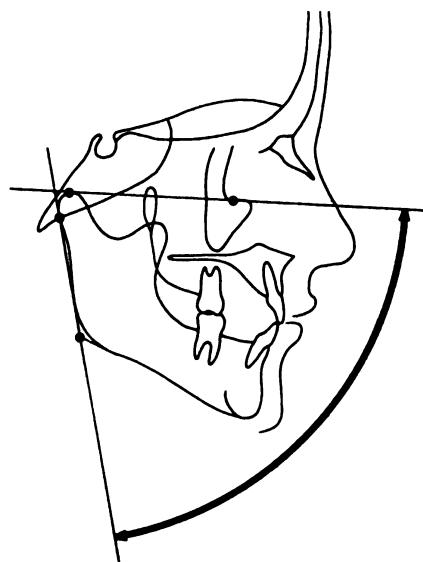
Condylar Plane/Mandibular Plane

Ok-CO/ME-GOI 40-33/1-28

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	28.6	3.9	6	25	29.0	4.1
7	44	29.0	4.8	7	31	29.2	3.8
8	44	28.2	4.4	8	36	27.9	3.5
9	46	27.4	4.6	9	31	27.8	4.1
10	45	27.7	5.1	10	35	27.8	4.3
11	43	27.2	4.4	11	30	27.5	4.7
12	44	26.6	4.7	12	27	27.0	4.5
13	42	26.1	5.0	13	29	27.4	5.7
14	39	25.6	5.0	14	25	27.2	5.0
15	32	26.5	5.0	15	19	25.2	4.9
16	23	26.4	4.8	16	9	22.7	4.3

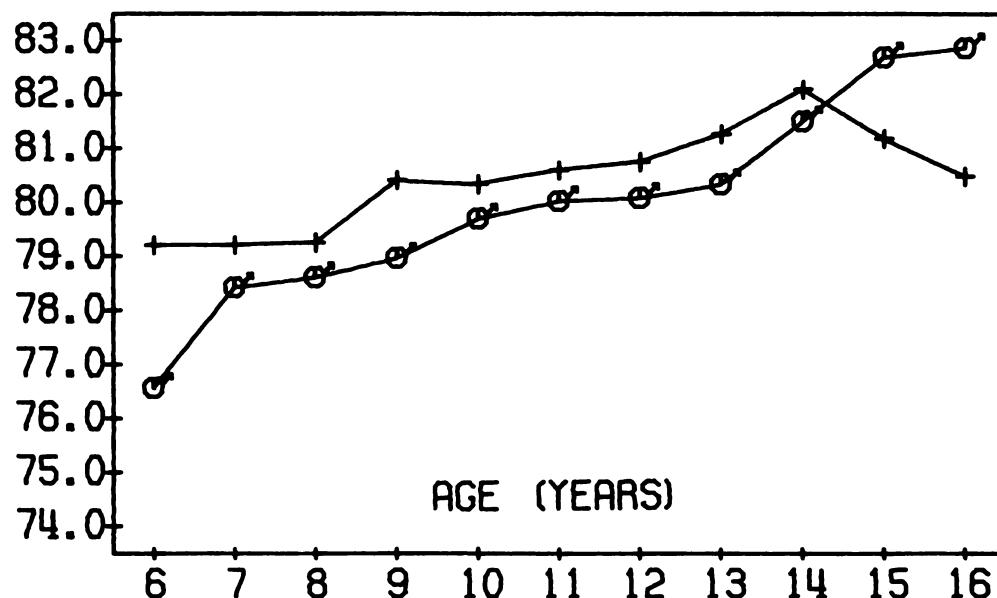


ANGULAR MEASUREMENT  
Variable 35

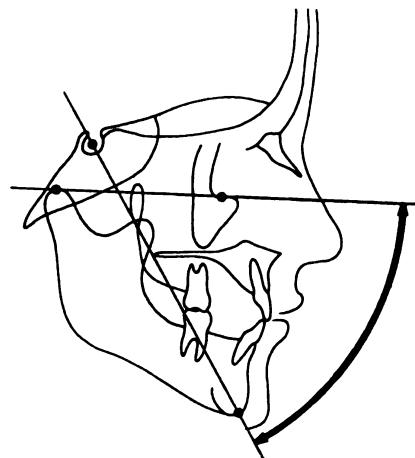


Condylar Plane/Articulare,  
Posterior-Gonial Intersection  
OR-CO/GOI-AR 40-33/28-31

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	76.6	3.7	6	25	79.2	3.8
7	44	78.4	4.2	7	31	79.2	3.5
8	44	78.6	4.4	8	36	79.3	3.6
9	46	79.0	4.3	9	31	80.4	4.1
10	45	79.7	3.8	10	35	80.3	3.5
11	43	80.0	4.3	11	30	80.6	3.8
12	44	80.1	4.2	12	27	80.8	3.8
13	42	80.3	4.1	13	29	81.3	4.2
14	40	81.5	3.9	14	25	82.1	4.6
15	32	82.7	4.2	15	19	81.2	5.4
16	23	82.9	4.0	16	9	80.5	4.2



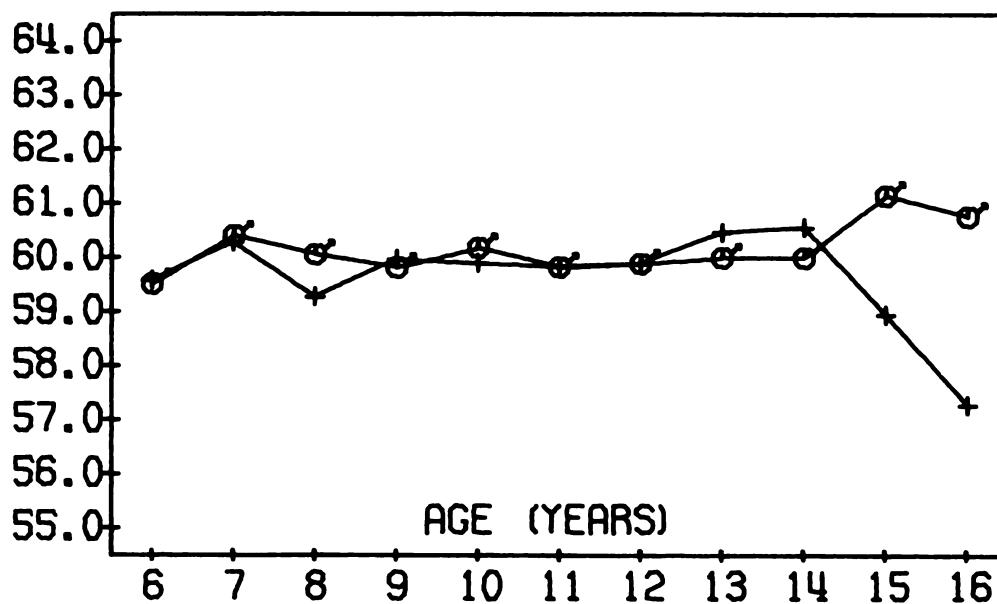
ANGULAR MEASUREMENT  
Variable 36



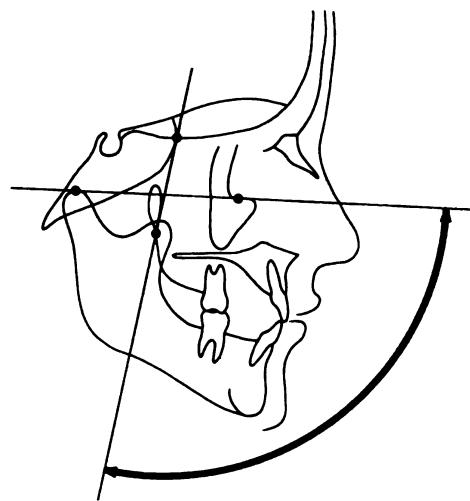
Condylar Plane/Sella-Gnathion

OR-CO/GN-S      40-33/2-35

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	59.5	2.8	6	25	59.6	3.4
7	44	60.4	3.3	7	31	60.3	3.4
8	44	60.1	3.4	8	36	59.3	3.2
9	46	59.8	3.1	9	31	60.0	3.5
10	45	60.2	3.5	10	35	59.9	3.8
11	43	59.8	3.1	11	30	59.8	4.1
12	44	59.9	3.1	12	27	59.9	3.6
13	42	60.0	3.3	13	29	60.5	4.7
14	40	60.0	3.5	14	25	60.6	4.2
15	33	61.2	3.4	* 15	19	58.9	4.1
16	23	60.8	3.4	* 16	9	57.3	4.4



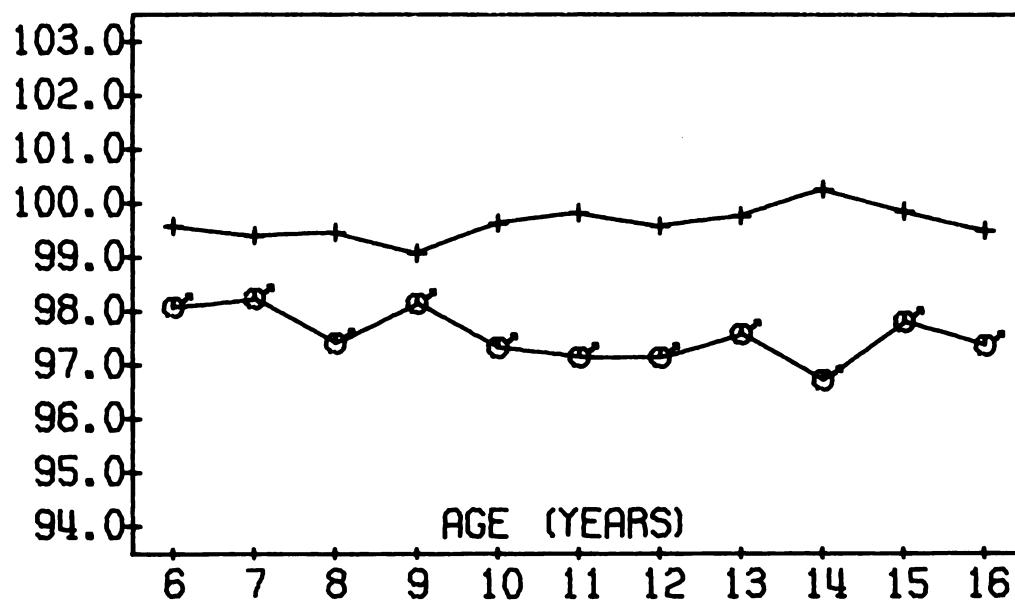
ANGULAR MEASUREMENT  
Variable 37



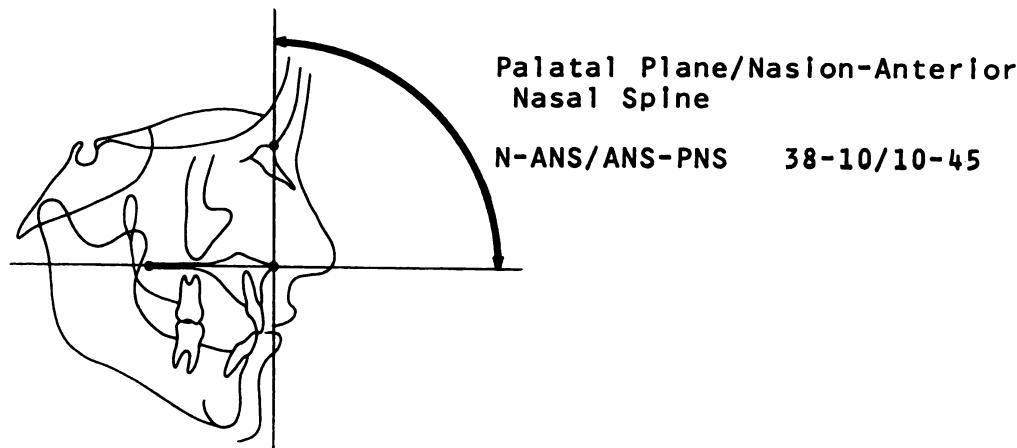
Condylar Plane/PM Vertical

OR-CO/PTM-SE      40-33/43-36

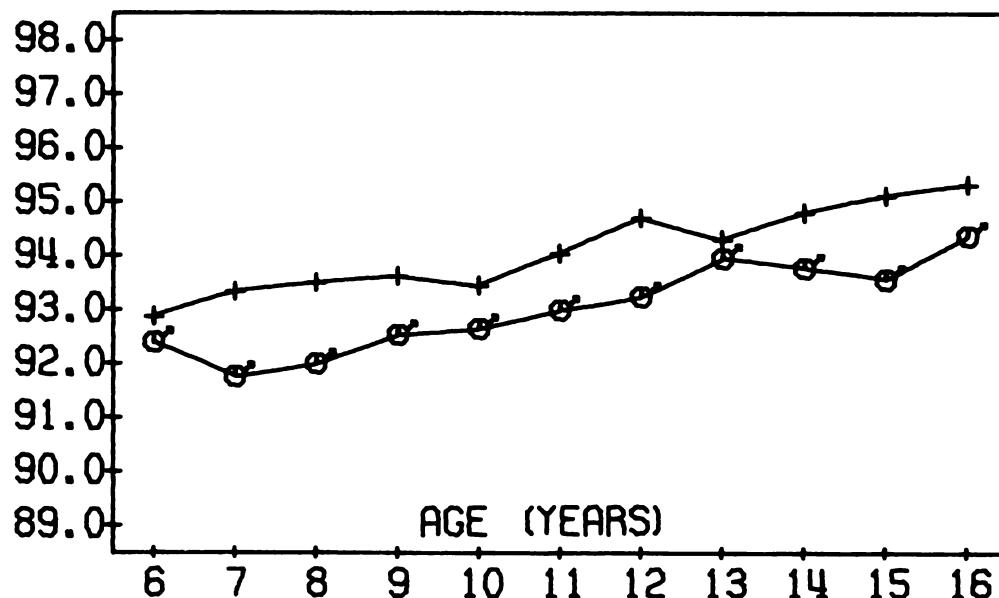
Age	N	Male				Age	N	Female	
		Mean	S.D.	deg.	deg.			Mean	S.D.
6	37	98.1	4.6			6	25	99.6	4.6
7	44	98.2	4.0			7	31	99.4	5.4
8	44	97.4	4.5			8	36	99.5	4.8
9	46	98.1	4.2			9	31	99.1	4.5
10	45	97.3	4.0	*		10	35	99.6	4.9
11	43	97.1	3.6	**		11	30	99.8	5.0
12	44	97.1	4.6	*		12	27	99.6	4.5
13	42	97.6	4.3	*		13	29	99.8	4.8
14	40	96.7	4.3	**		14	25	100.3	4.5
15	33	97.8	4.7			15	19	99.9	5.1
16	23	97.4	4.5			16	9	99.5	5.0



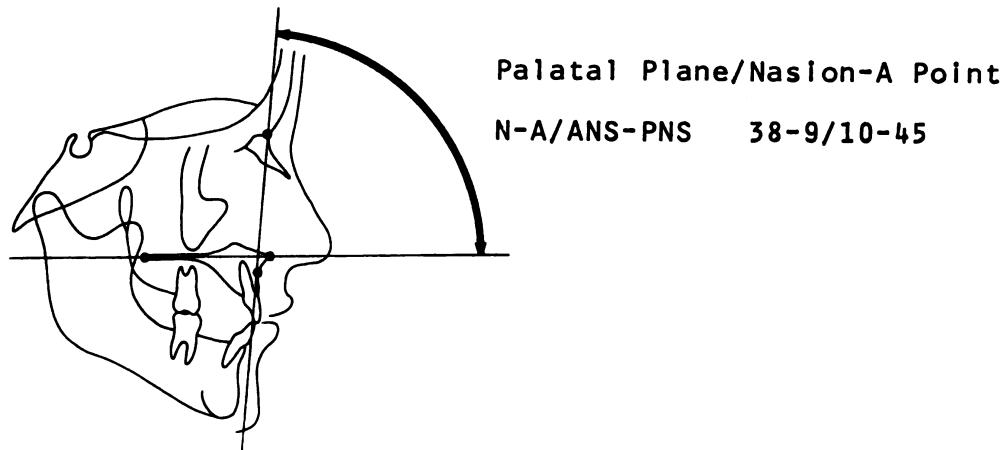
**ANGULAR MEASUREMENT  
Variable 38**



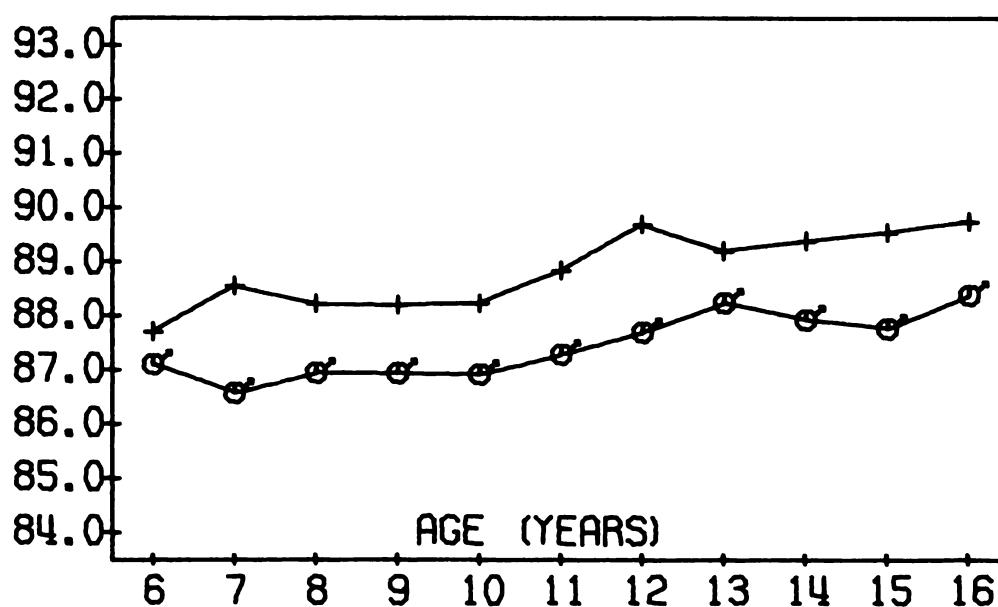
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	92.4	3.4	6	24	92.9	2.1
7	44	91.8	2.9	7	31	93.3	2.7
8	44	92.0	3.2	8	36	93.5	2.7
9	47	92.5	3.3	9	31	93.6	2.8
10	46	92.7	3.5	10	35	93.5	2.8
11	43	93.0	3.2	11	30	94.0	3.7
12	44	93.2	3.4	12	27	94.7	2.6
13	43	94.0	3.8	13	29	94.3	3.4
14	39	93.8	3.6	14	25	94.8	3.9
15	33	93.6	3.6	15	19	95.1	3.1
16	23	94.4	4.4	16	9	95.3	3.3



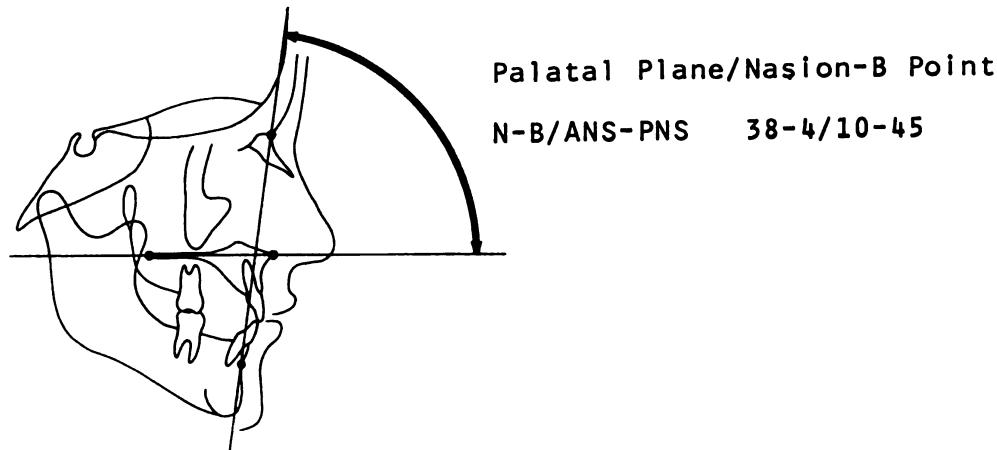
ANGULAR MEASUREMENT  
Variable 39



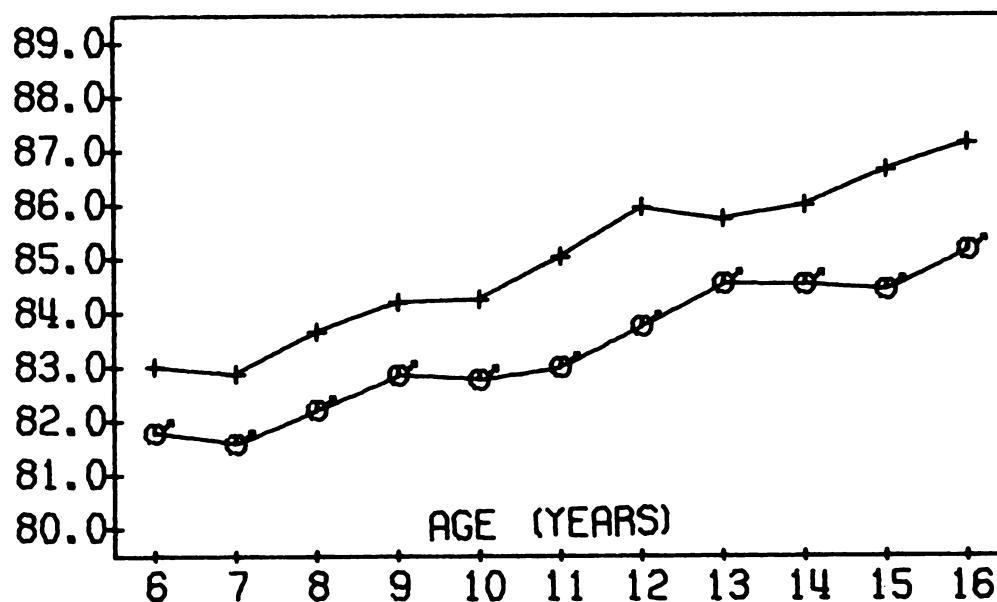
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	87.1	3.1			87.7	2.3
7	44	86.6	3.0			88.6	2.3
8	44	87.0	3.1	**		88.2	2.6
9	47	86.9	3.1			88.2	3.2
10	46	86.9	3.5			88.2	2.8
11	43	87.3	3.3			88.8	3.3
12	44	87.7	3.5	**		89.7	2.8
13	43	88.2	3.7			89.2	3.1
14	39	87.9	3.6			89.4	3.4
15	33	87.8	3.6			89.5	3.1
16	23	88.4	4.0			89.7	3.2



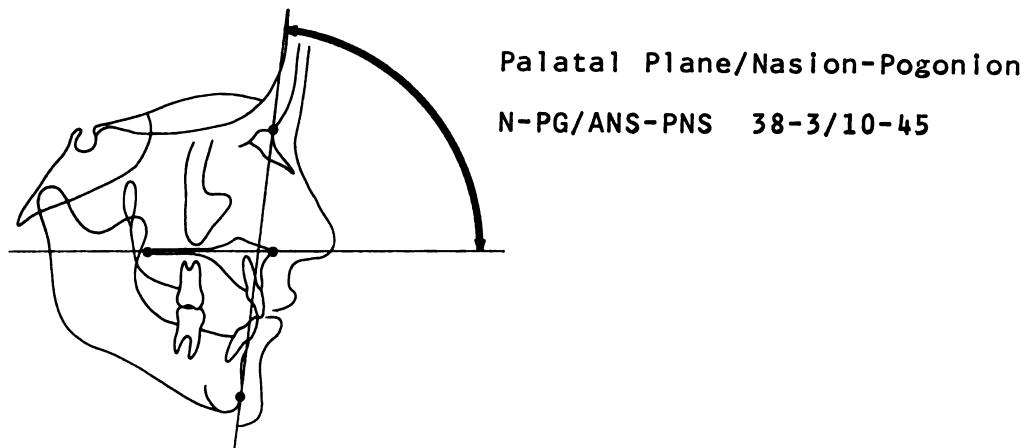
ANGULAR MEASUREMENT  
Variable 40



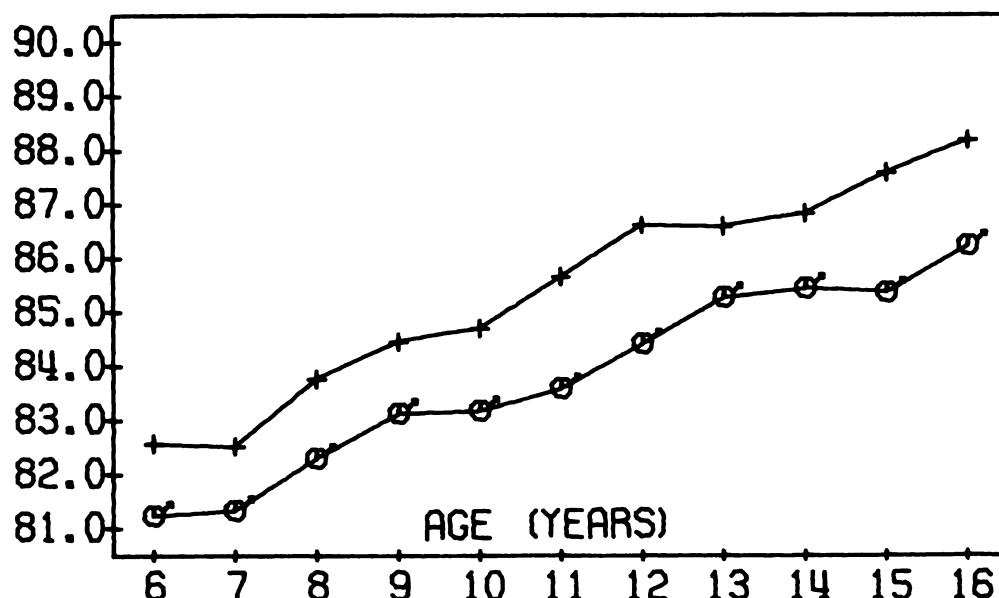
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	81.8	2.7	6	24	83.0	3.1
7	44	81.6	2.8	7	31	82.9	2.9
8	44	82.2	2.6	8	36	83.7	2.6
9	46	82.9	2.4	9	31	84.2	3.5
10	45	82.8	2.7	10	35	84.2	3.0
11	43	83.0	2.6	11	30	85.0	3.4
12	44	83.8	2.8	12	27	85.9	3.0
13	43	84.5	3.2	13	29	85.7	3.4
14	39	84.5	2.9	14	25	86.0	3.9
15	33	84.4	2.8	15	19	86.6	3.7
16	23	85.2	3.4	16	9	87.1	2.5



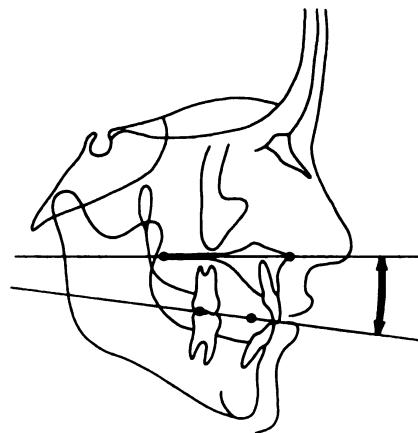
ANGULAR MEASUREMENT  
Variable 41



Age	N	Male		Age	N	Female		
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.	
6	37	81.2	2.7	6	24	82.6	3.3	
7	44	81.3	2.8	7	31	82.5	3.0	
8	44	82.3	2.7	8	36	83.8	2.7	
9	46	83.1	2.4	*	9	31	84.4	3.4
10	45	83.2	2.7	*	10	35	84.7	3.2
11	43	83.6	2.6	**	11	30	85.7	3.3
12	44	84.4	2.8	**	12	27	86.6	3.0
13	43	85.3	3.2		13	29	86.6	3.5
14	39	85.4	2.9		14	25	86.8	4.2
15	33	85.4	2.8	*	15	19	87.6	3.9
16	23	86.2	3.2		16	9	88.2	2.7



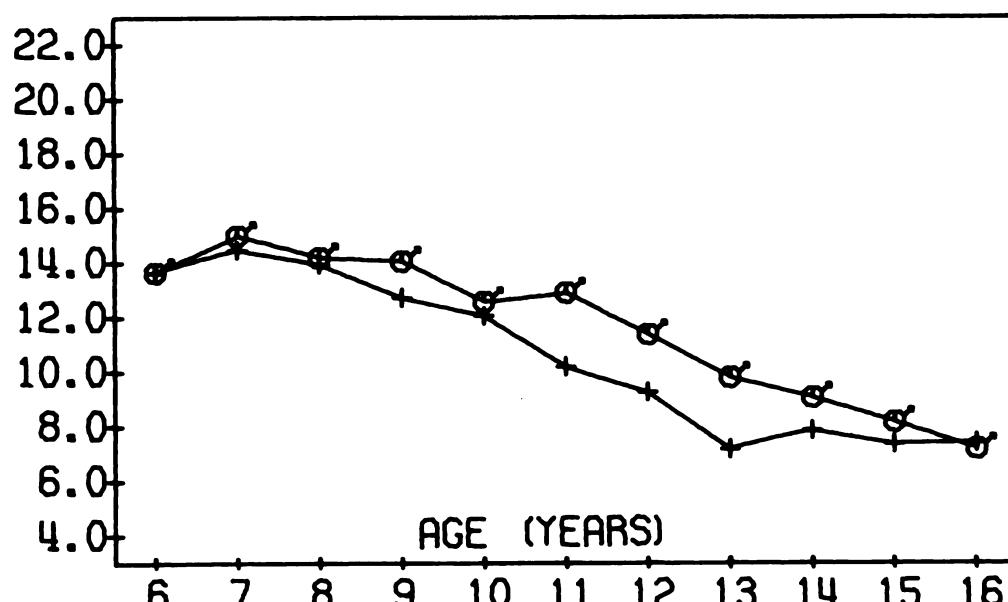
ANGULAR MEASUREMENT  
Variable 42



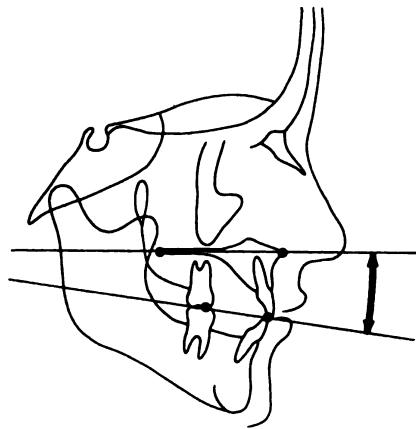
Palatal Plane/Functional  
Occlusal Plane

ANS-PNS/PMC-FPP 10-45/46-50

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	36	13.6	4.5	6	24	13.6	5.1
7	43	15.0	4.1	7	31	14.5	4.8
8	44	14.2	3.9	8	36	14.0	3.9
9	47	14.1	3.0	9	30	12.7	4.0
10	46	12.6	3.9	10	35	12.1	4.4
11	43	12.9	3.6	11	30	10.2	4.3
12	44	11.4	4.0	12	27	9.3	3.8
13	42	9.8	4.1	13	29	7.2	3.6
14	39	9.1	3.9	14	25	7.9	3.9
15	32	8.2	3.5	15	19	7.4	4.1
16	23	7.2	3.5	16	9	7.4	3.4



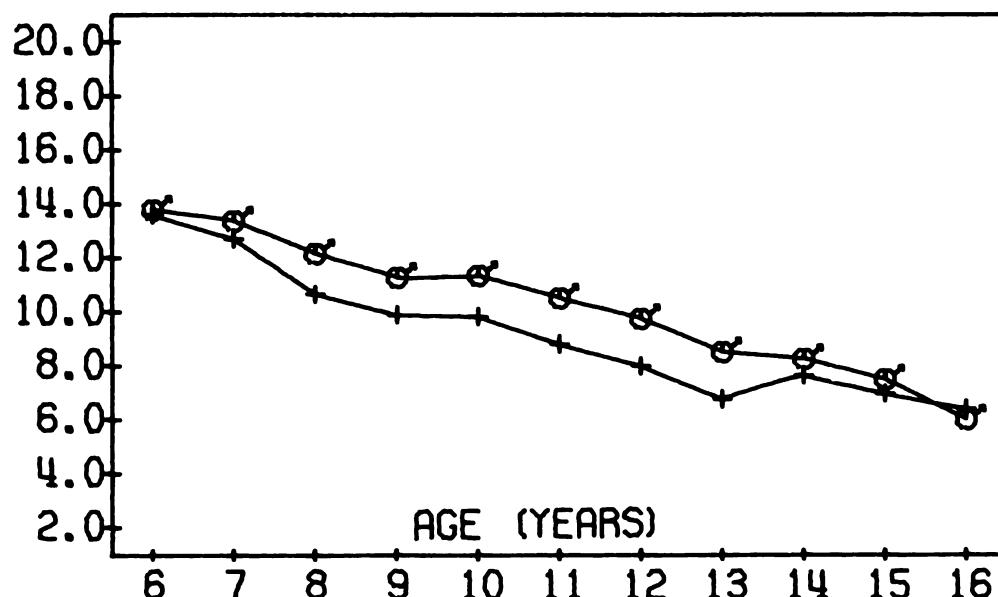
ANGULAR MEASUREMENT  
Variable 43



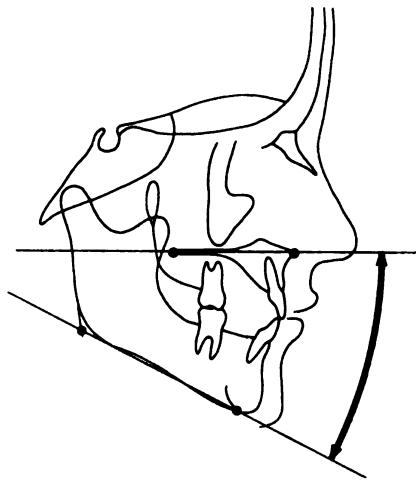
Palatal Plane/Downs Occlusal  
Plane

ANS-PNS/ADP-PDP 10-45/56-57

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	13.8	3.9	6	24	13.6	4.1
7	44	13.4	3.7	7	31	12.7	4.1
8	44	12.2	2.8	8	36	10.7	2.8
9	47	11.3	2.6	9	31	9.9	2.9
10	46	11.3	2.5	10	35	9.8	2.9
11	43	10.5	2.8	11	30	8.8	2.9
12	44	9.7	2.9	12	27	8.0	2.8
13	43	8.5	3.0	13	29	6.8	3.2
14	39	8.3	3.3	14	25	7.7	3.7
15	33	7.5	2.7	15	19	7.0	3.3
16	23	6.0	3.1	16	9	6.4	2.5



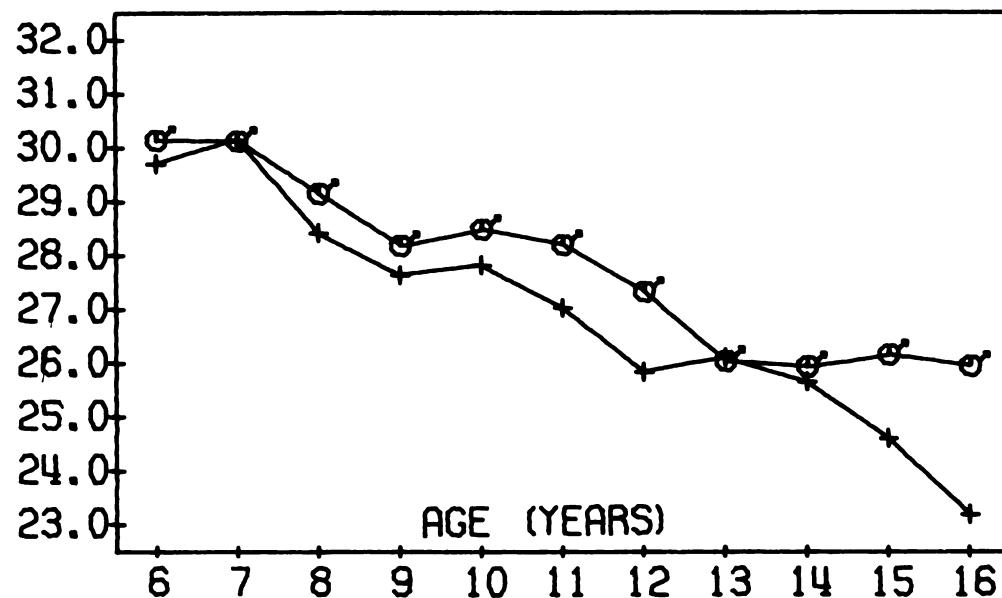
ANGULAR MEASUREMENT  
Variable 44



Palatal Plane/Mandibular Plane

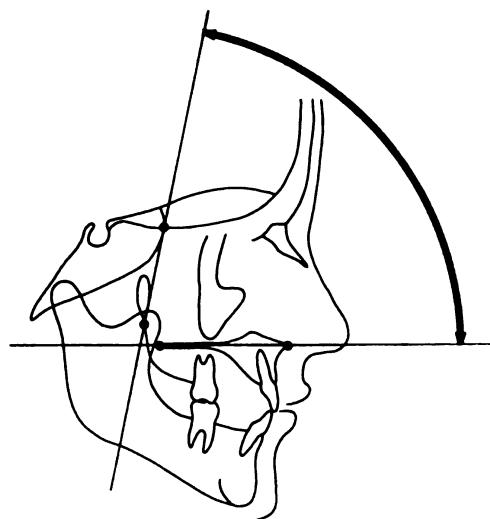
ANS-PNS/ME-GO1 10-45/1-28

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	30.1	3.8	6	24	29.7	5.6
7	44	30.1	4.8	7	31	30.1	5.0
8	44	29.1	4.4	8	36	28.4	4.5
9	46	28.2	4.3	9	31	27.6	5.2
10	45	28.5	4.7	10	35	27.8	4.9
11	43	28.2	4.6	11	30	27.0	5.1
12	44	27.3	4.9	12	27	25.8	5.1
13	42	26.0	5.3	13	29	26.1	5.4
14	39	25.9	4.9	14	25	25.6	6.1
15	32	26.2	4.9	15	19	24.6	5.7
16	23	25.9	5.1	16	9	23.2	3.7

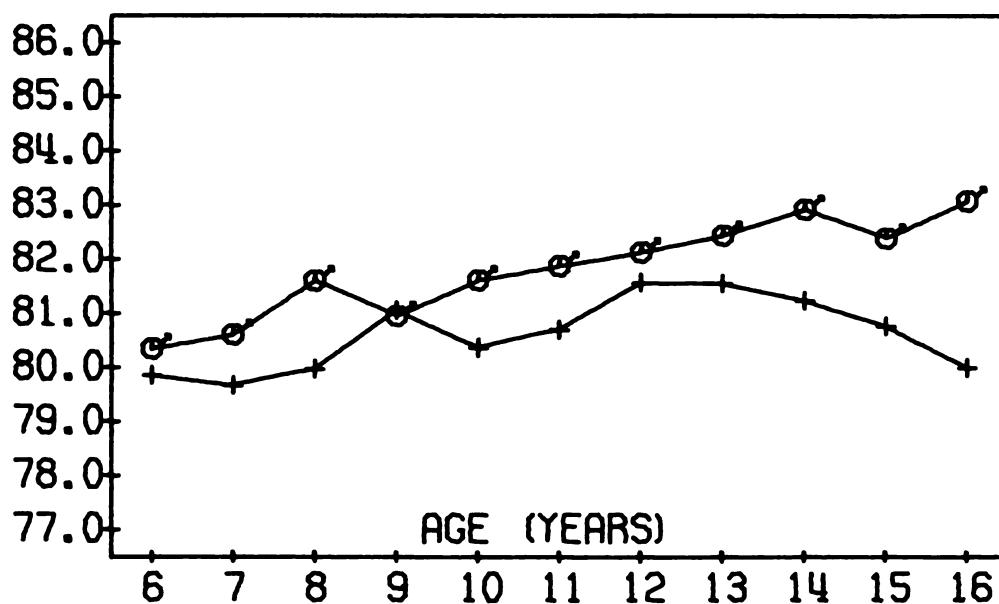


ANGULAR MEASUREMENT  
Variable 45

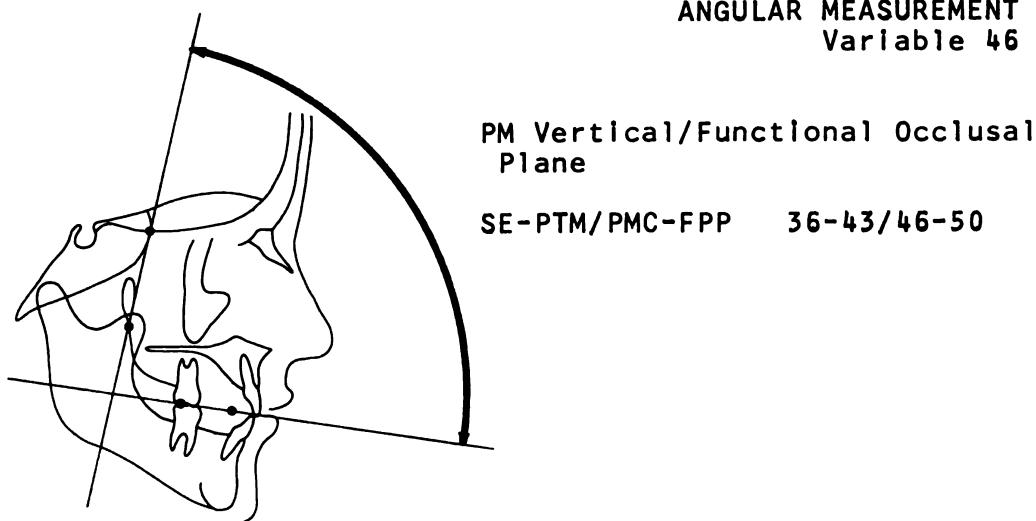
PM Vertical/Palatal Plane  
SE-PTM/ANS-PNS 36-43/10-45



Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	80.4	3.8	6	24	79.9	4.3
7	44	80.6	3.5	7	31	79.7	3.6
8	44	81.6	3.3	*	8	36	80.0
9	47	81.0	3.5	9	31	81.1	3.8
10	46	81.6	3.6	10	35	80.4	4.1
11	43	81.9	3.1	11	30	80.7	4.1
12	44	82.1	3.7	12	27	81.6	4.3
13	43	82.4	3.7	13	29	81.6	4.3
14	39	82.9	4.1	14	25	81.2	4.4
15	33	82.4	5.0	15	19	80.8	5.3
16	23	83.1	3.8	16	9	80.0	5.5



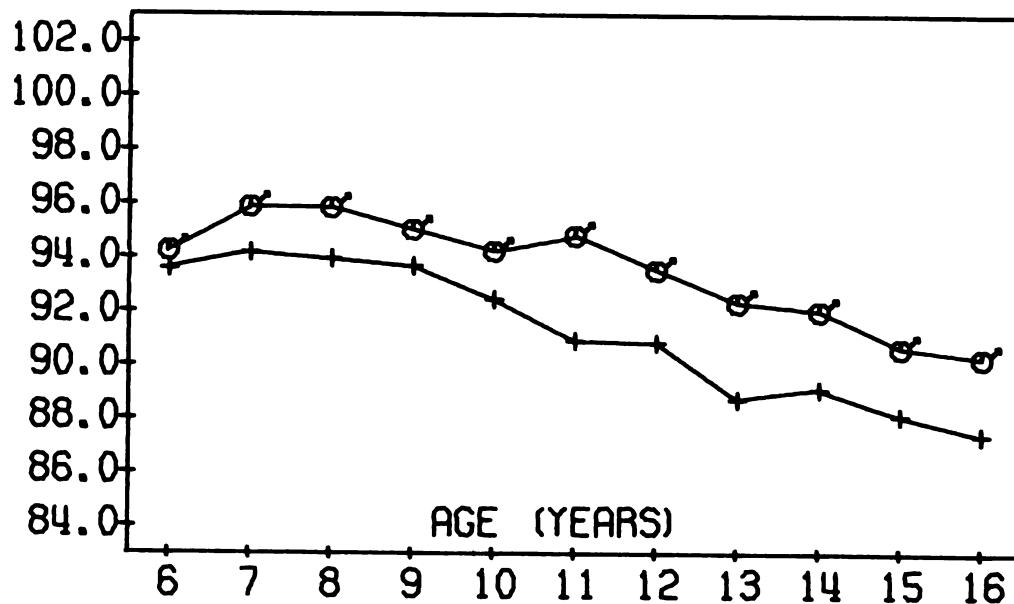
ANGULAR MEASUREMENT  
Variable 46



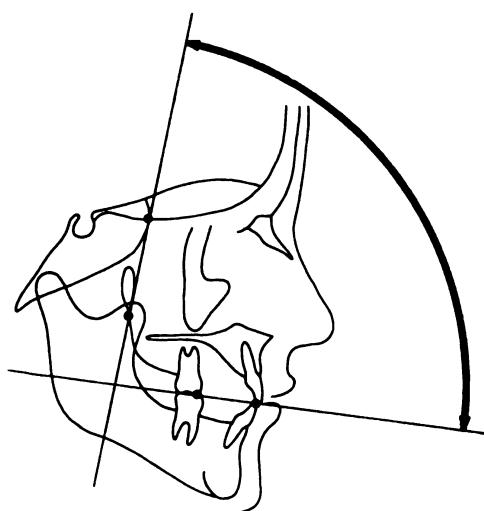
PM Vertical/Functional Occlusal  
Plane

SE-PTM/PMC-FPP 36-43/46-50

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	36	94.2	5.7	6	25	93.6	6.4
7	43	95.9	5.5	7	31	94.2	6.1
8	44	95.8	5.9	8	36	93.9	5.1
9	47	95.0	4.4	9	30	93.7	4.7
10	46	94.2	5.1	10	35	92.4	5.8
11	43	94.8	4.4	11	30	90.9	5.6
12	44	93.5	5.4	12	27	90.8	5.1
13	42	92.3	5.2	13	29	88.7	6.0
14	39	92.0	5.3	14	25	89.1	5.8
15	32	90.6	5.5	15	19	88.1	6.6
16	23	90.3	4.9	16	9	87.4	6.0



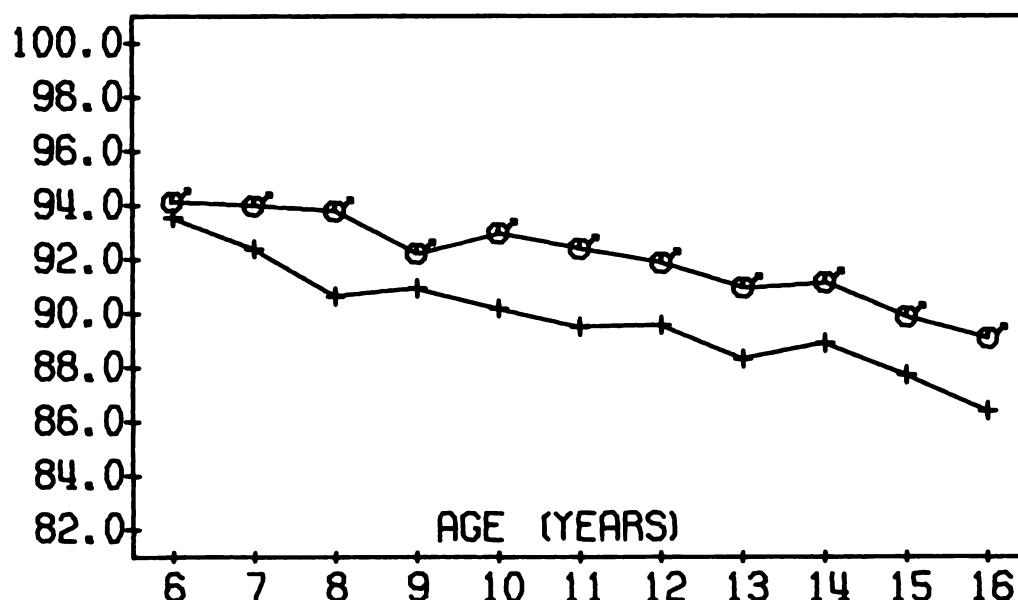
**ANGULAR MEASUREMENT**  
Variable 47



PM Vertical/Downs Occlusal  
Plane

SE-PTM/ADP-PDP 36-43/56-57

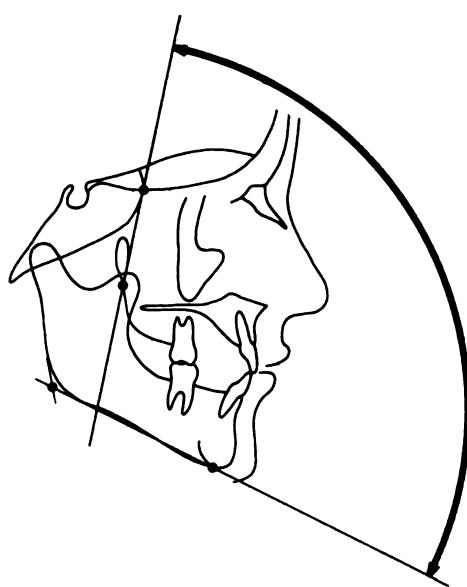
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	94.1	4.4	6	25	93.5	4.6
7	44	94.0	5.1	7	31	92.4	5.4
8	44	93.8	4.5	8	36	90.6	4.2
9	47	92.2	4.2	9	31	90.9	3.6
10	46	93.0	4.1	10	35	90.2	4.6
11	43	92.4	4.1	11	30	89.5	4.4
12	44	91.9	4.6	12	27	89.6	4.8
13	43	90.9	4.6	13	29	88.3	5.3
14	40	91.1	4.4	14	25	88.9	5.6
15	33	89.9	5.6	15	19	87.7	6.6
16	23	89.1	5.1	16	9	86.4	6.3



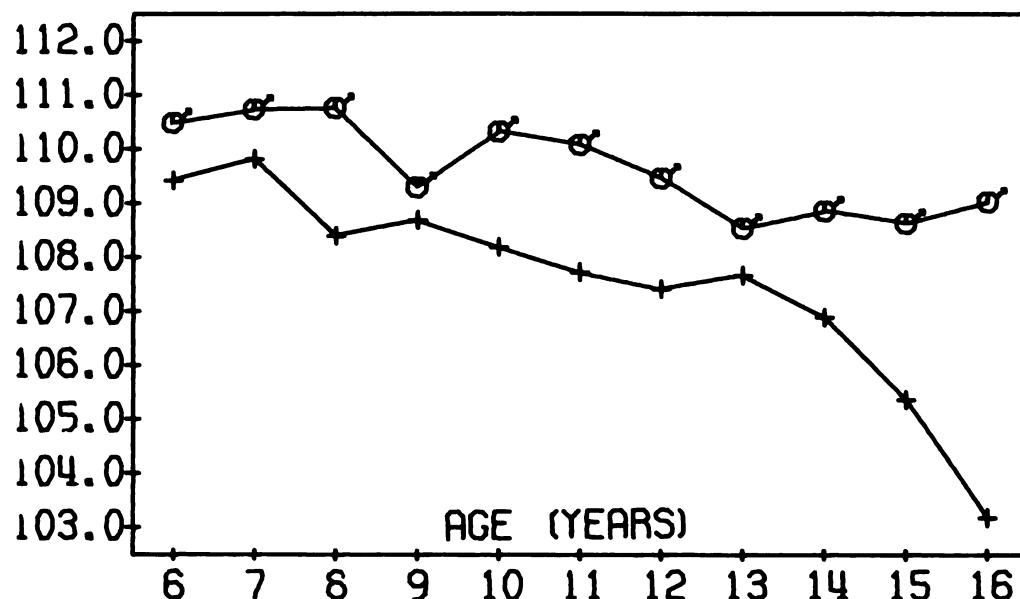
**ANGULAR MEASUREMENT**  
Variable 48

PM Vertical/Mandibular Plane

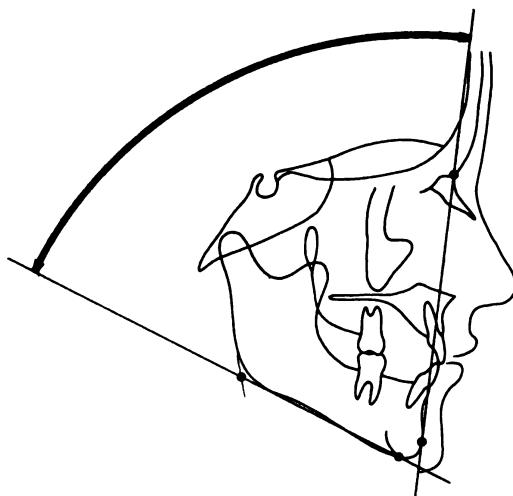
SE-PTM/ME-GO1 36-43/1-28



Age	N	Male		Female	
		Mean deg.	S.D. deg.	Mean deg.	S.D. deg.
6	37	110.5	5.4	6	25
7	44	110.7	5.8	7	31
8	44	110.8	6.2	8	36
9	46	109.3	5.7	9	31
10	45	110.3	6.0	10	35
11	43	110.1	5.7	11	30
12	44	109.5	6.4	12	27
13	42	108.5	6.1	13	29
14	39	108.9	6.2	14	25
15	32	108.6	7.3	15	19
16	23	109.0	6.4	*	16
			*		9
					103.2
					5.7



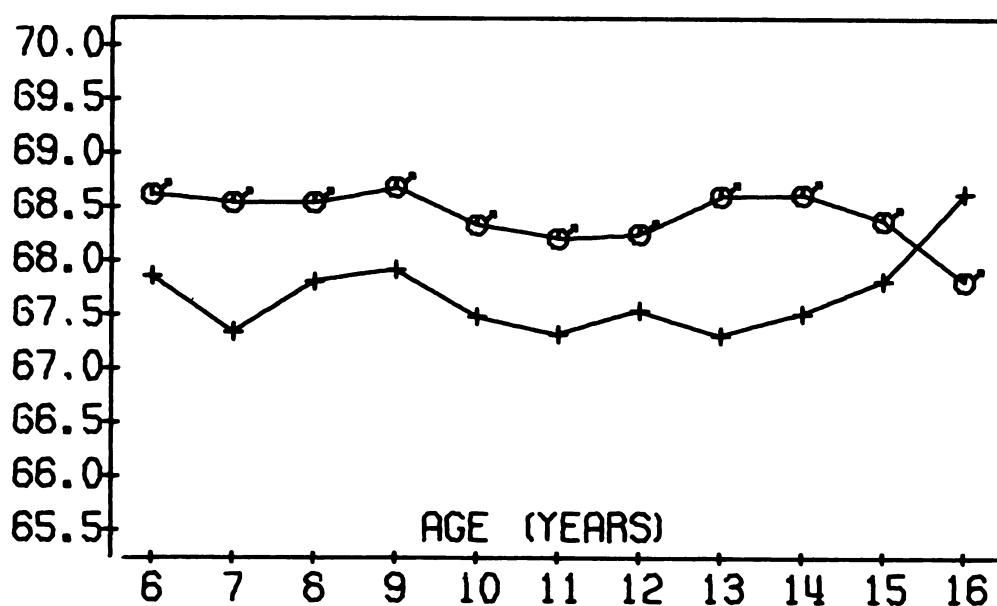
ANGULAR MEASUREMENT  
Variable 49



Nasion-Pogonion/Mandibular  
Plane

G01-ME/N-PG 28-1/38-3

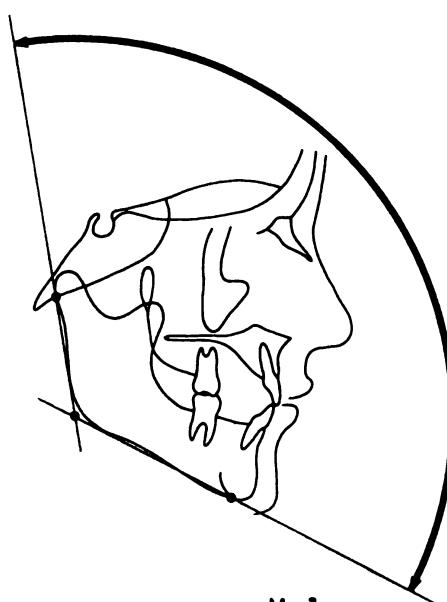
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	68.6	3.4	6	25	67.9	3.1
7	44	68.5	3.6	7	31	67.3	2.8
8	44	68.5	3.3	8	36	67.8	2.8
9	46	68.7	3.5	9	31	67.9	3.1
10	45	68.3	3.8	10	35	67.5	3.0
11	43	68.2	3.7	11	30	67.3	2.9
12	44	68.2	3.7	12	27	67.5	2.9
13	42	68.6	4.0	13	29	67.3	2.6
14	39	68.6	3.4	14	25	67.5	2.6
15	32	68.4	3.7	15	19	67.8	2.7
16	23	67.8	3.7	16	9	68.6	2.3



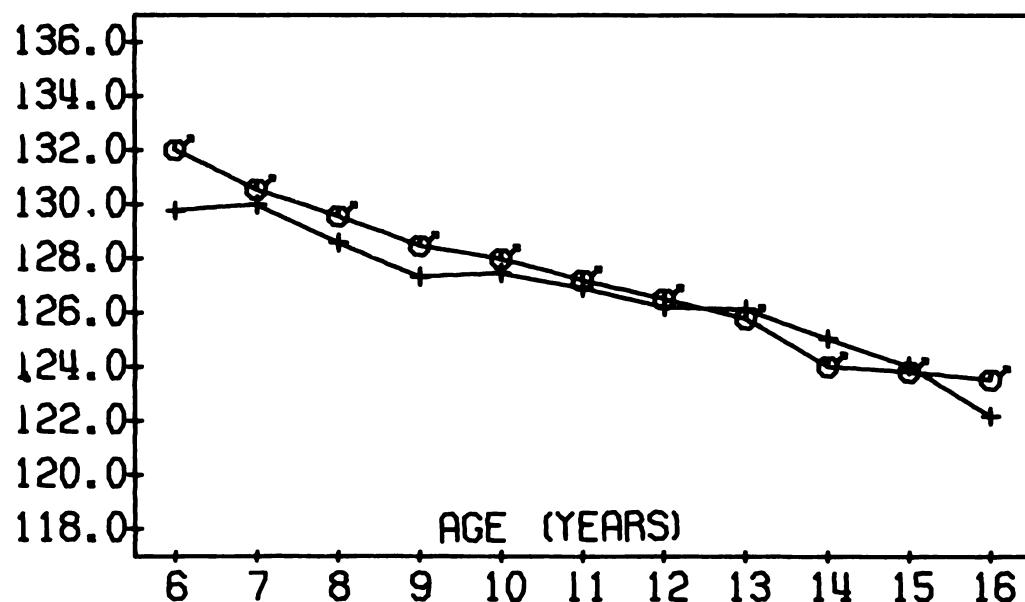
ANGULAR MEASUREMENT  
Variable 50

Menton-Gonial Intersection-  
Articulare, Posterior

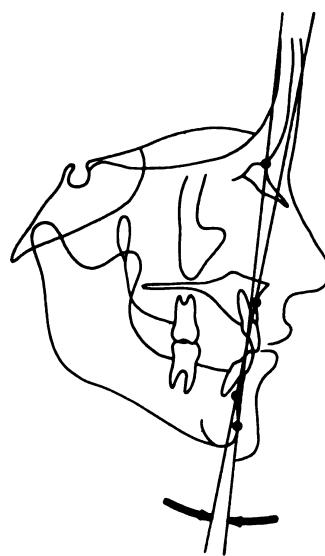
AR-GOI-ME      31-28-1



Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	132.0	4.8	6	25	129.8	5.1
7	44	130.5	4.7	7	31	130.0	4.3
8	44	129.5	4.6	8	36	128.6	4.7
9	47	128.5	4.7	9	31	127.3	4.7
10	46	128.0	4.9	10	35	127.5	4.5
11	43	127.2	5.0	11	30	126.9	4.6
12	44	126.5	5.2	12	27	126.2	4.2
13	42	125.8	5.0	13	29	126.1	5.9
14	39	124.0	5.3	14	25	125.0	4.7
15	32	123.8	5.3	15	19	124.0	4.2
16	23	123.5	5.9	16	9	122.2	4.2



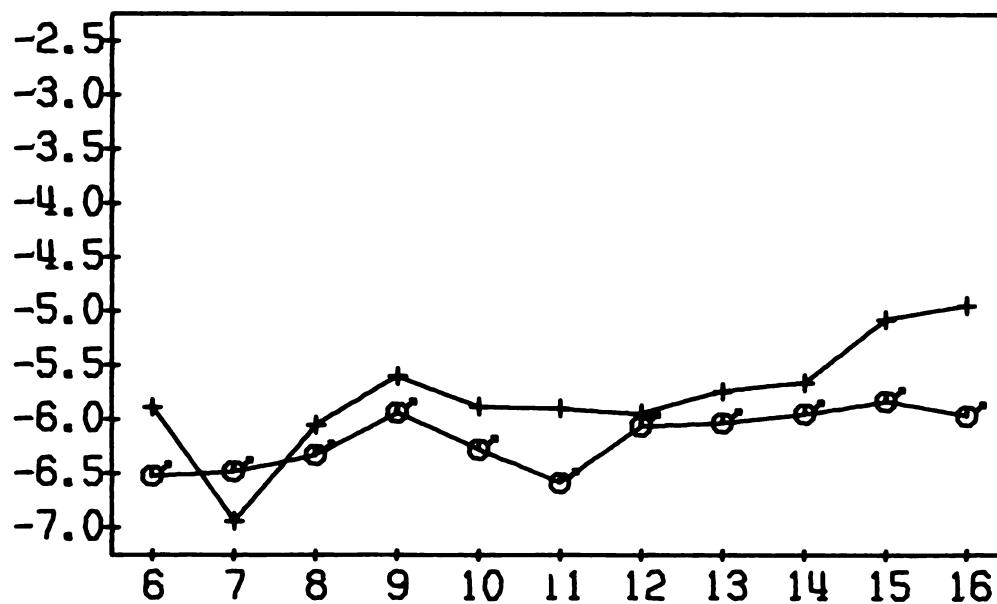
ANGULAR MEASUREMENT  
Variable 51



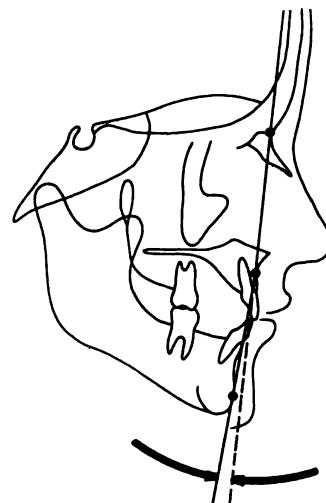
A Point-B Point/Nasion-  
Pogonion  
Downs Analysis

A-B/N-PG      9-4/38-3

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	-6.5	2.9	6	25	-5.9	2.9
7	44	-6.5	3.3	7	31	-6.9	3.5
8	44	-6.3	2.9	8	36	-6.1	3.1
9	46	-5.9	2.5	9	31	-5.6	3.7
10	45	-6.3	2.7	10	35	-5.9	3.7
11	43	-6.6	2.6	11	30	-5.9	3.2
12	44	-6.1	2.7	12	27	-5.9	3.6
13	43	-6.0	2.7	13	29	-5.7	3.4
14	40	-5.9	2.9	14	25	-5.7	3.5
15	33	-5.8	2.9	15	19	-5.1	3.9
16	23	-6.0	3.1	16	9	-4.9	3.5



**ANGULAR MEASUREMENT  
Variable 52**

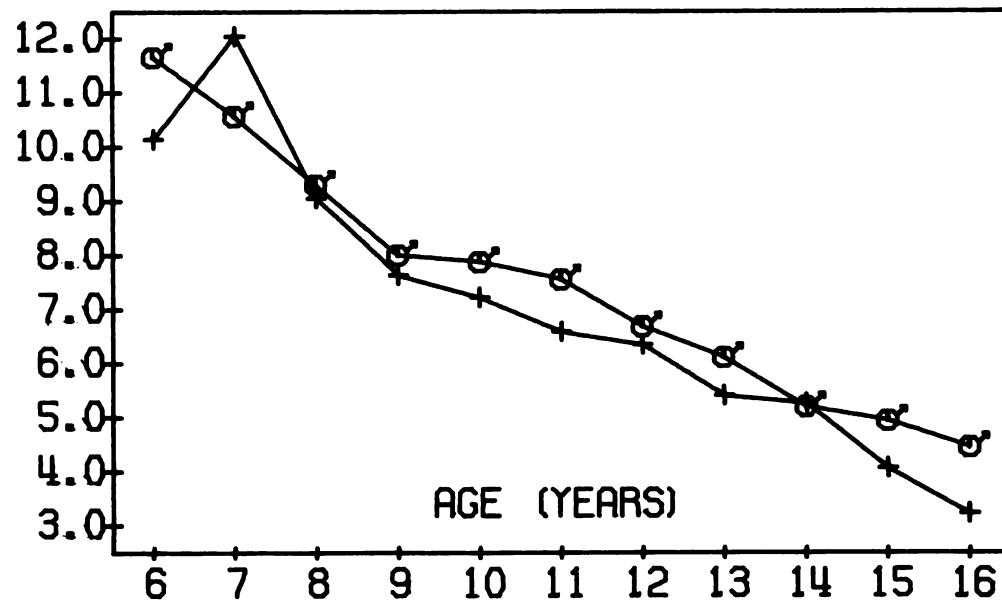


**Nasion-A Point-Pogonion  
Downs Analysis**

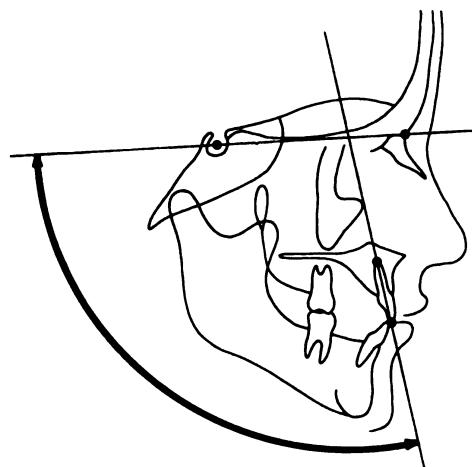
**N-A-PG**

**180 deg - (38-9-3)**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	11.7	4.9	6	25	10.1	4.8
7	44	10.6	4.9	7	31	12.0	5.4
8	44	9.3	5.1	8	36	9.0	5.2
9	46	8.0	4.5	9	31	7.6	5.6
10	45	7.9	4.9	10	35	7.2	5.7
11	43	7.5	4.5	11	30	6.6	4.5
12	44	6.7	4.8	12	27	6.4	5.5
13	43	6.1	4.8	13	29	5.4	5.3
14	40	5.2	4.8	14	25	5.3	5.9
15	33	4.9	5.1	15	19	4.1	5.9
16	23	4.4	6.0	16	9	3.2	5.6



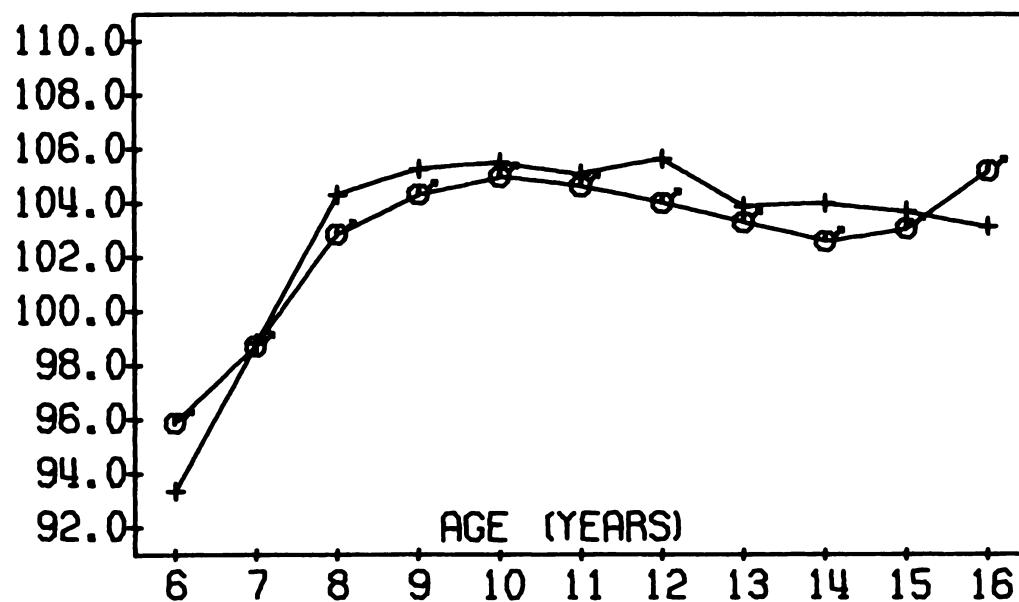
ANGULAR MEASUREMENT  
Variable 53



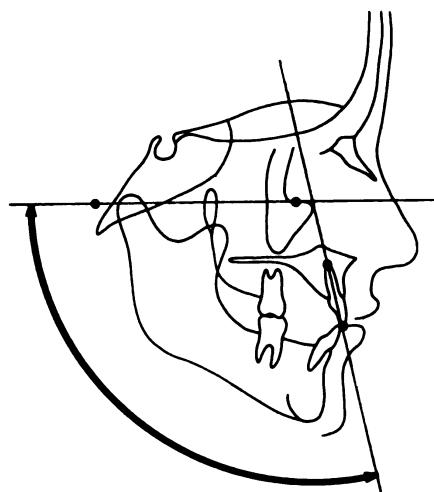
Upper Incisor/Sella-Nasion

UIE-UIA/S-N

Age	N	Male		Female	
		Mean deg.	S.D. deg.	Mean deg.	S.D. deg.
6	37	95.9	8.7	6	25
7	44	98.7	8.4	7	31
8	44	102.9	6.7	8	36
9	47	104.3	5.1	9	31
10	46	105.0	5.3	10	35
11	43	104.6	5.7	11	30
12	44	104.0	5.5	12	27
13	43	103.3	5.9	13	29
14	40	102.6	6.0	14	25
15	33	103.0	5.9	15	19
16	23	105.2	6.4	16	9



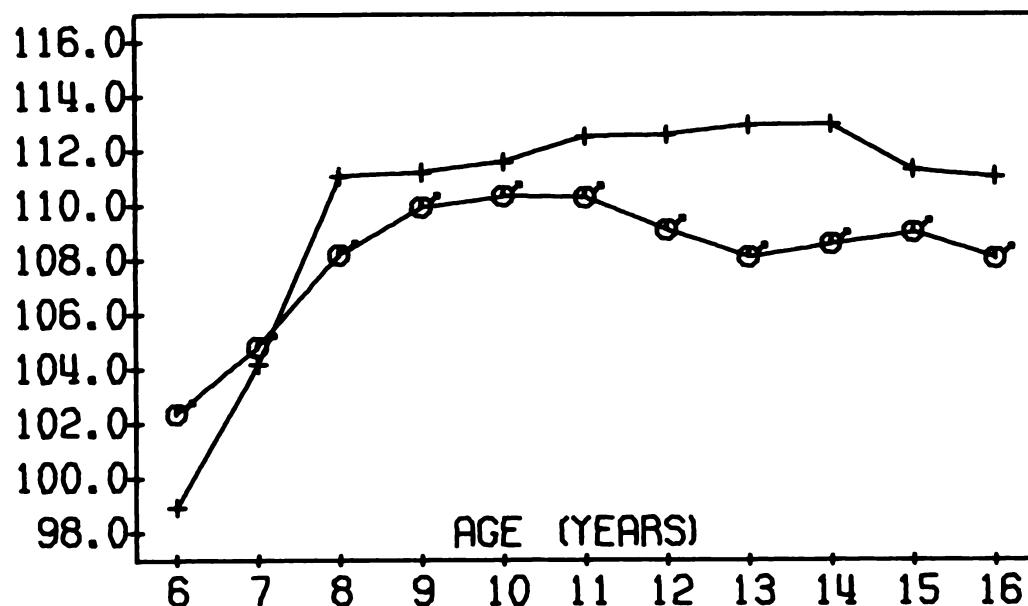
**ANGULAR MEASUREMENT  
Variable 54**



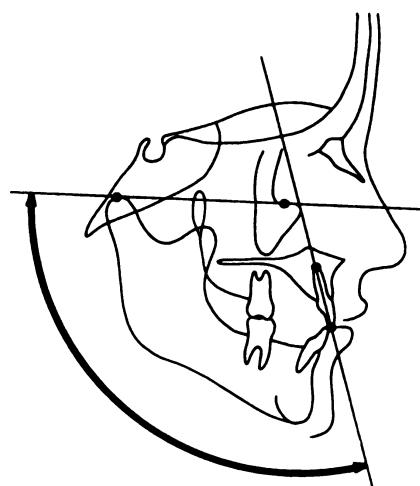
**Upper Incisor/Frankfort Plane**

**UIE-UIA/PO-OR      7-12/49-40**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	102.4	8.7	6	12	98.9	12.5
7	22	104.8	7.0	7	14	104.2	8.4
8	23	108.2	6.7	8	18	111.1	6.0
9	24	110.0	6.7	9	15	111.2	5.8
10	25	110.4	6.7	10	14	111.6	7.1
11	25	110.3	7.3	11	13	112.5	6.8
12	24	109.1	7.9	12	13	112.6	6.9
13	23	108.1	7.9	13	9	112.9	4.3
14	20	108.6	7.0	14	9	113.0	4.2
15	17	109.0	7.6	15	7	111.3	4.3
16	13	108.1	7.5	16	5	111.1	6.3



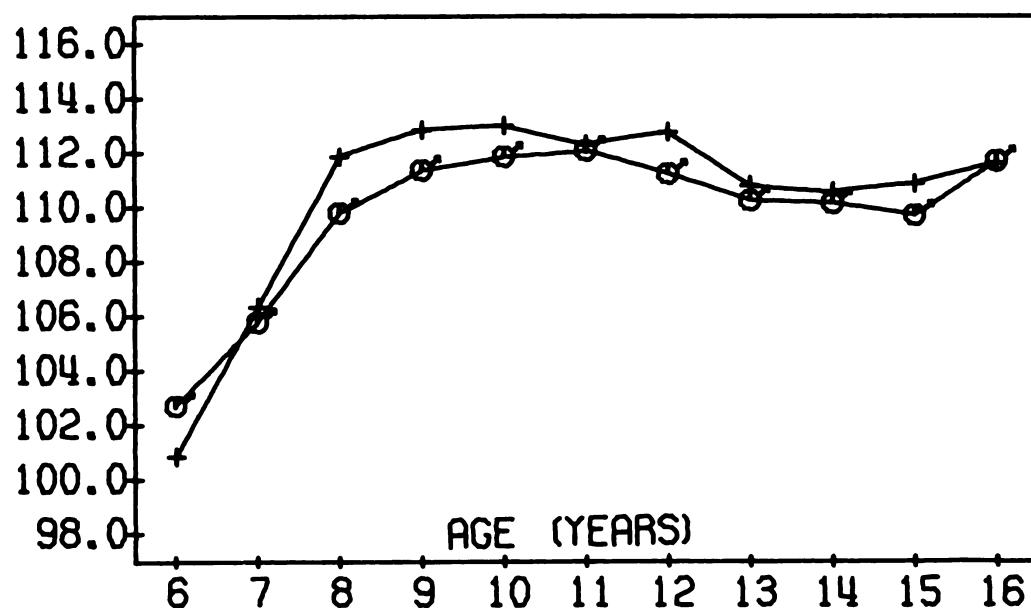
ANGULAR MEASUREMENT  
Variable 55



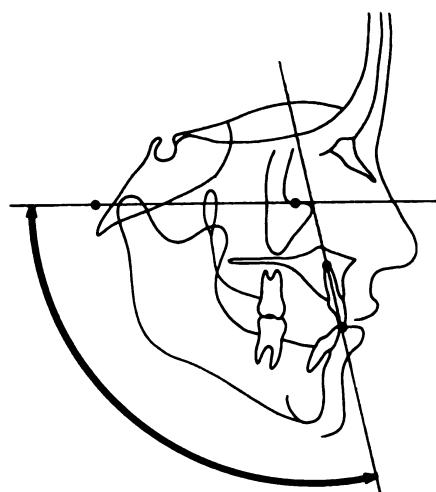
Upper Incisor/Condylar Plane

UIE-UIA/CU-OR 7-12/33-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	102.7	8.7	6	25	100.8	9.8
7	44	105.8	8.8	7	31	106.4	9.2
8	44	109.8	7.0	8	36	111.9	7.4
9	46	111.4	5.3	9	31	112.9	6.2
10	45	111.9	5.6	10	35	113.0	7.4
11	43	112.1	6.2	11	30	112.3	7.1
12	44	111.2	6.1	12	27	112.8	6.6
13	42	110.3	6.4	13	29	110.8	6.0
14	40	110.2	6.4	14	25	110.6	6.6
15	33	109.7	5.9	15	19	110.9	7.2
16	23	111.7	6.4	16	9	111.6	6.4



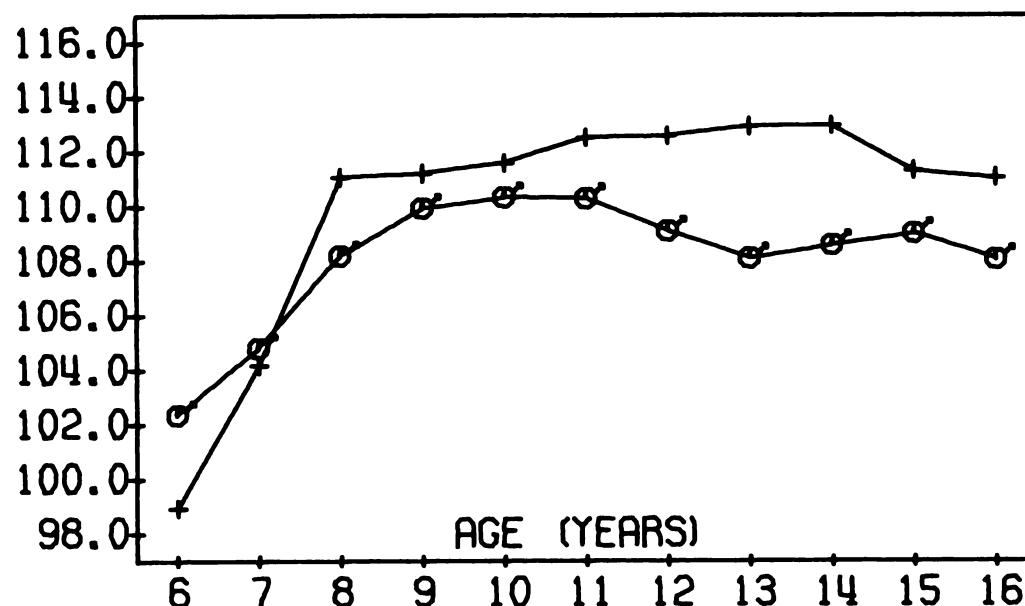
**ANGULAR MEASUREMENT  
Variable 54**



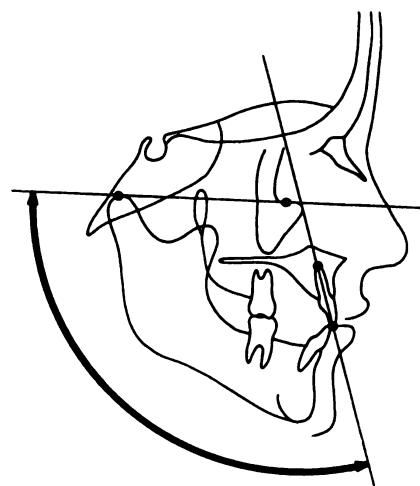
**Upper Incisor/Frankfort Plane**

**UIE-UIA/PO-OR      7-12/49-40**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	102.4	8.7	6	12	98.9	12.5
7	22	104.8	7.0	7	14	104.2	8.4
8	23	108.2	6.7	8	18	111.1	6.0
9	24	110.0	6.7	9	15	111.2	5.8
10	25	110.4	6.7	10	14	111.6	7.1
11	25	110.3	7.3	11	13	112.5	6.8
12	24	109.1	7.9	12	13	112.6	6.9
13	23	108.1	7.9	* 13	9	112.9	4.3
14	20	108.6	7.0	14	9	113.0	4.2
15	17	109.0	7.6	15	7	111.3	4.3
16	13	108.1	7.5	16	5	111.1	6.3



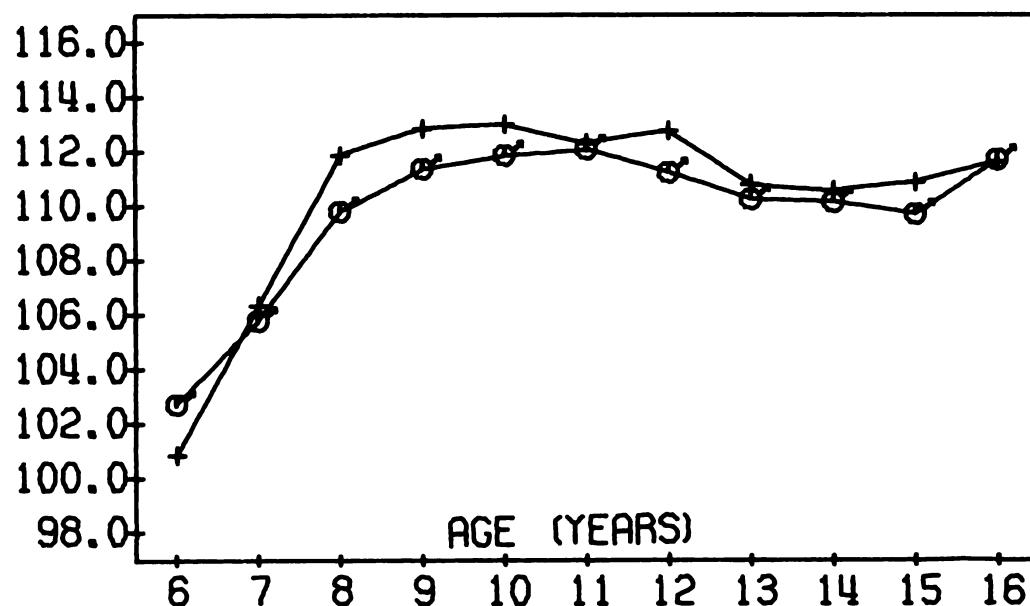
ANGULAR MEASUREMENT  
Variable 55



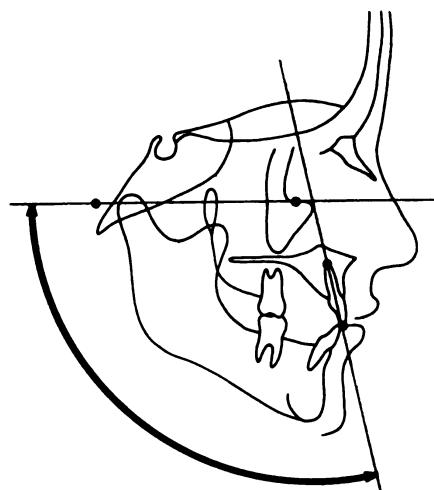
Upper Incisor/Condylar Plane

UIE-UIA/CU-OR 7-12/33-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	102.7	8.7	6	25	100.8	9.8
7	44	105.8	8.8	7	31	106.4	9.2
8	44	109.8	7.0	8	36	111.9	7.4
9	46	111.4	5.3	9	31	112.9	6.2
10	45	111.9	5.6	10	35	113.0	7.4
11	43	112.1	6.2	11	30	112.3	7.1
12	44	111.2	6.1	12	27	112.8	6.6
13	42	110.3	6.4	13	29	110.8	6.0
14	40	110.2	6.4	14	25	110.6	6.6
15	33	109.7	5.9	15	19	110.9	7.2
16	23	111.7	6.4	16	9	111.6	6.4



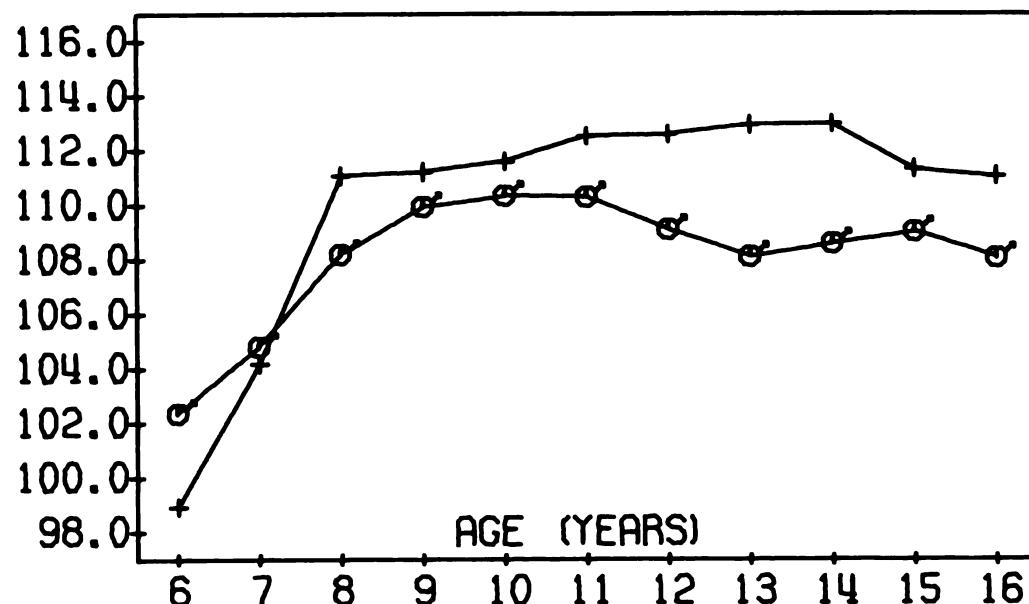
ANGULAR MEASUREMENT  
Variable 54



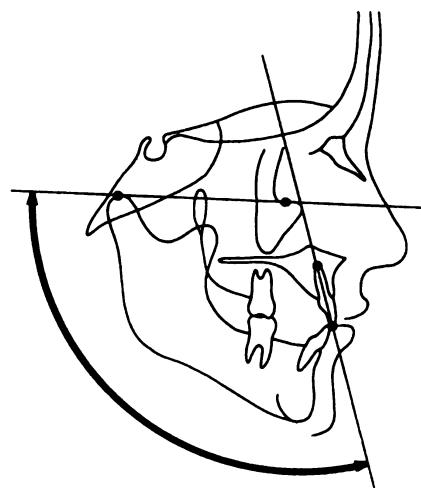
Upper Incisor/Frankfort Plane

UIE-UIA/PO-OR 7-12/49-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	102.4	8.7	6	12	98.9	12.5
7	22	104.8	7.0	7	14	104.2	8.4
8	23	108.2	6.7	8	18	111.1	6.0
9	24	110.0	6.7	9	15	111.2	5.8
10	25	110.4	6.7	10	14	111.6	7.1
11	25	110.3	7.3	11	13	112.5	6.8
12	24	109.1	7.9	12	13	112.6	6.9
13	23	108.1	7.9	13	9	112.9	4.3
14	20	108.6	7.0	14	9	113.0	4.2
15	17	109.0	7.6	15	7	111.3	4.3
16	13	108.1	7.5	16	5	111.1	6.3



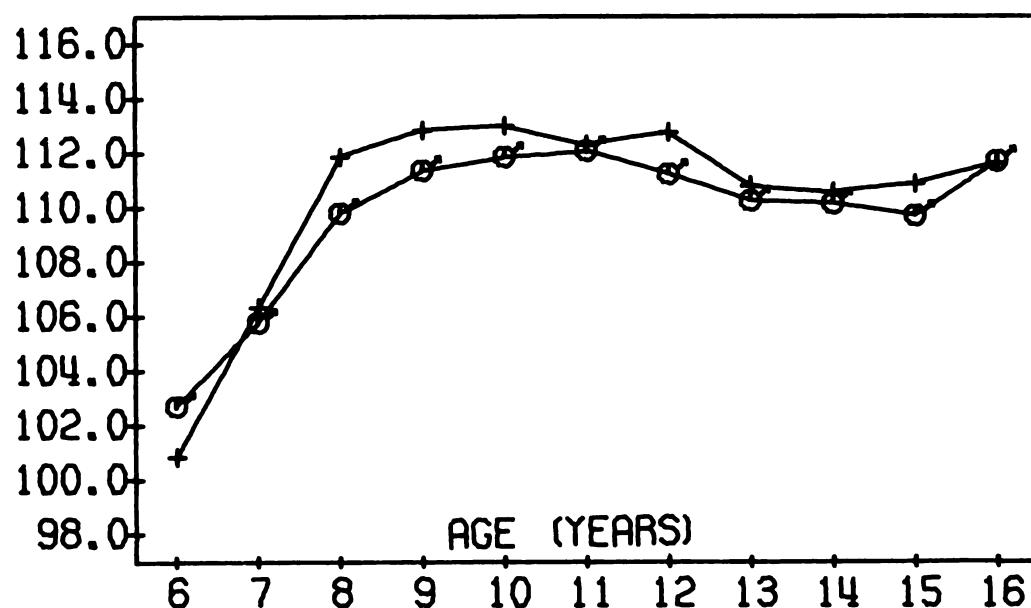
**ANGULAR MEASUREMENT  
Variable 55**



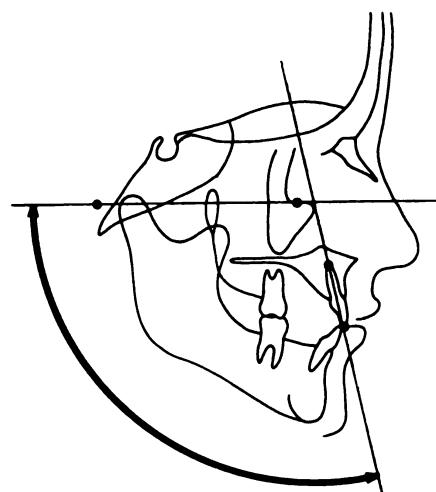
**Upper Incisor/Condylar Plane**

**UIE-UIA/CU-OR      7-12/33-40**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	102.7	8.7	6	25	100.8	9.8
7	44	105.8	8.8	7	31	106.4	9.2
8	44	109.8	7.0	8	36	111.9	7.4
9	46	111.4	5.3	9	31	112.9	6.2
10	45	111.9	5.6	10	35	113.0	7.4
11	43	112.1	6.2	11	30	112.3	7.1
12	44	111.2	6.1	12	27	112.8	6.6
13	42	110.3	6.4	13	29	110.8	6.0
14	40	110.2	6.4	14	25	110.6	6.6
15	33	109.7	5.9	15	19	110.9	7.2
16	23	111.7	6.4	16	9	111.6	6.4



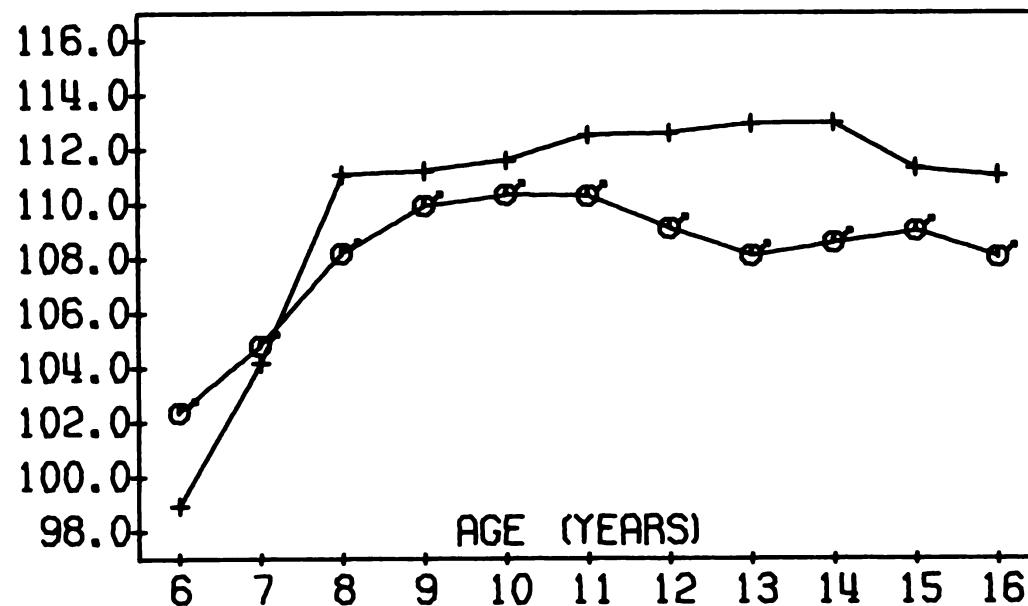
ANGULAR MEASUREMENT  
Variable 54



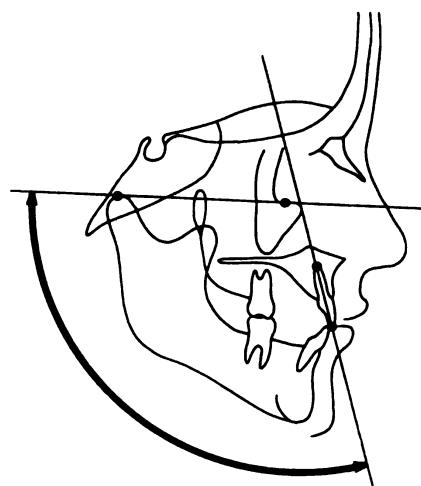
Upper Incisor/Frankfort Plane

UIE-UIA/PO-OR 7-12/49-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	102.4	8.7	6	12	98.9	12.5
7	22	104.8	7.0	7	14	104.2	8.4
8	23	108.2	6.7	8	18	111.1	6.0
9	24	110.0	6.7	9	15	111.2	5.8
10	25	110.4	6.7	10	14	111.6	7.1
11	25	110.3	7.3	11	13	112.5	6.8
12	24	109.1	7.9	12	13	112.6	6.9
13	23	108.1	7.9	* 13	9	112.9	4.3
14	20	108.6	7.0	14	9	113.0	4.2
15	17	109.0	7.6	15	7	111.3	4.3
16	13	108.1	7.5	16	5	111.1	6.3



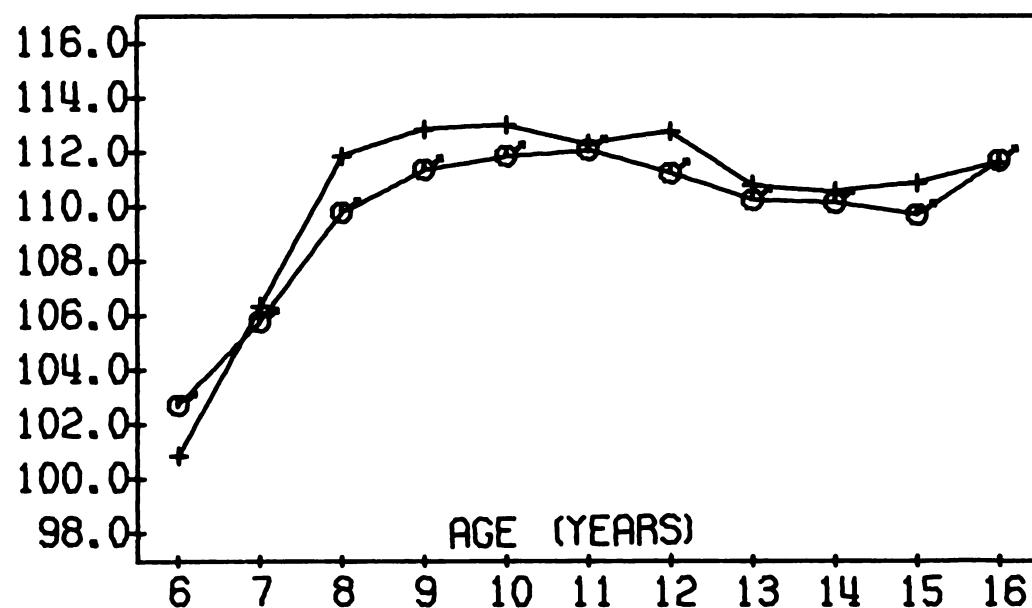
ANGULAR MEASUREMENT  
Variable 55



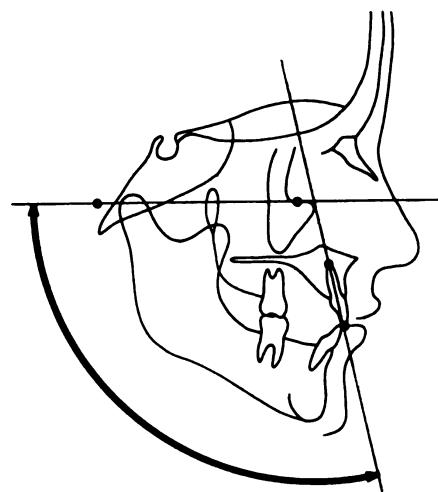
Upper Incisor/Condylar Plane

UIE-UIA/CU-OR 7-12/33-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	102.7	8.7	6	25	100.8	9.8
7	44	105.8	8.8	7	31	106.4	9.2
8	44	109.8	7.0	8	36	111.9	7.4
9	46	111.4	5.3	9	31	112.9	6.2
10	45	111.9	5.6	10	35	113.0	7.4
11	43	112.1	6.2	11	30	112.3	7.1
12	44	111.2	6.1	12	27	112.8	6.6
13	42	110.3	6.4	13	29	110.8	6.0
14	40	110.2	6.4	14	25	110.6	6.6
15	33	109.7	5.9	15	19	110.9	7.2
16	23	111.7	6.4	16	9	111.6	6.4



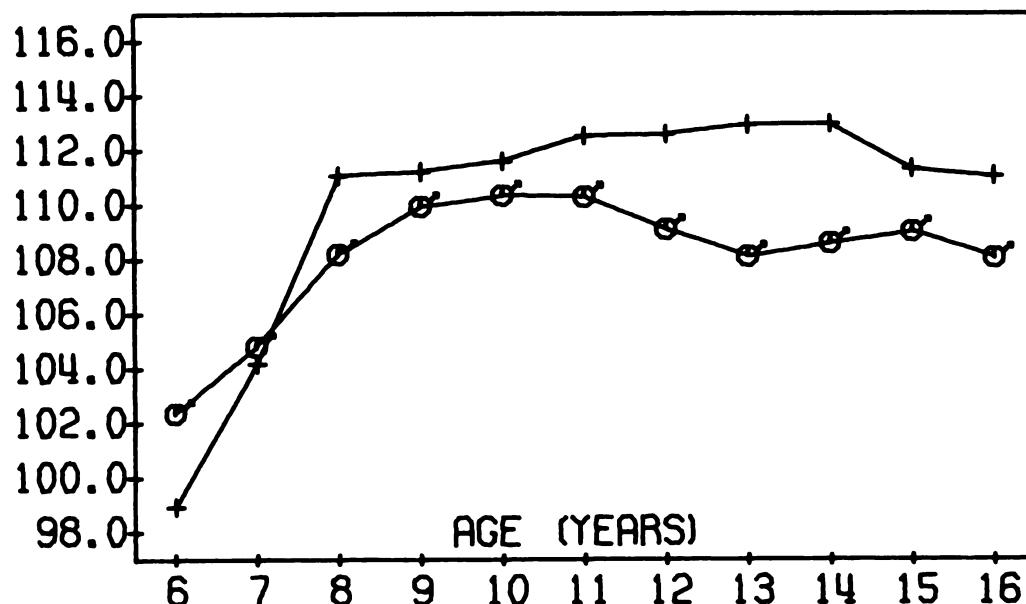
**ANGULAR MEASUREMENT  
Variable 54**



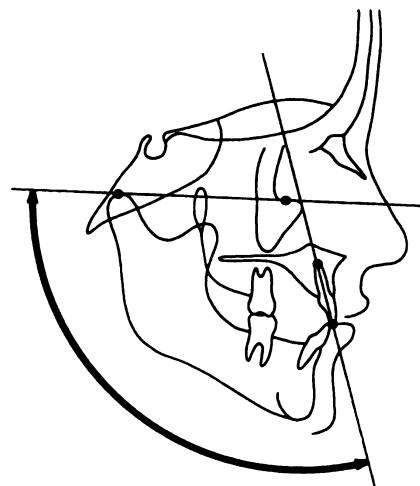
**Upper Incisor/Frankfort Plane**

**UIE-UIA/PO-OR      7-12/49-40**

<b>Age</b>	<b>N</b>	<b>Male</b>		<b>Age</b>	<b>N</b>	<b>Female</b>	
		<b>Mean</b>	<b>S.D.</b>			<b>Mean</b>	<b>S.D.</b>
6	21	102.4	8.7	6	12	98.9	12.5
7	22	104.8	7.0	7	14	104.2	8.4
8	23	108.2	6.7	8	18	111.1	6.0
9	24	110.0	6.7	9	15	111.2	5.8
10	25	110.4	6.7	10	14	111.6	7.1
11	25	110.3	7.3	11	13	112.5	6.8
12	24	109.1	7.9	12	13	112.6	6.9
13	23	108.1	7.9	* 13	9	112.9	4.3
14	20	108.6	7.0	14	9	113.0	4.2
15	17	109.0	7.6	15	7	111.3	4.3
16	13	108.1	7.5	16	5	111.1	6.3



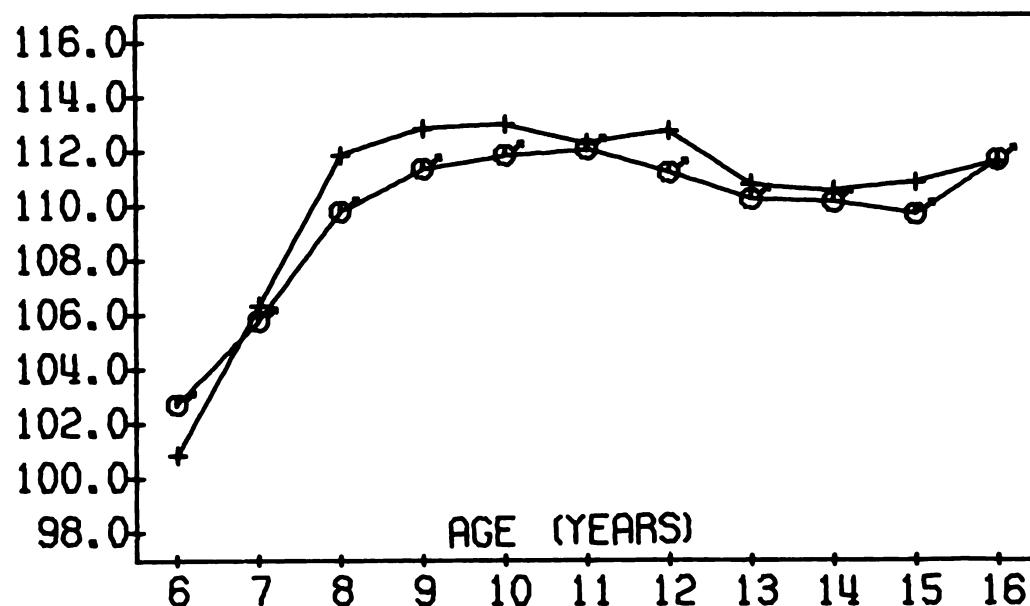
**ANGULAR MEASUREMENT  
Variable 55**



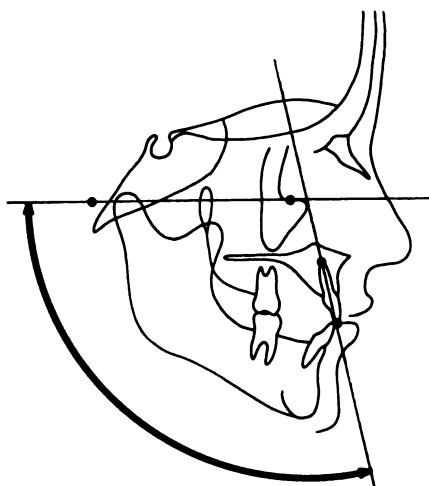
Upper Incisor/Condylar Plane

UIE-UIA/CU-OR      7-12/33-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	102.7	8.7	6	25	100.8	9.8
7	44	105.8	8.8	7	31	106.4	9.2
8	44	109.8	7.0	8	36	111.9	7.4
9	46	111.4	5.3	9	31	112.9	6.2
10	45	111.9	5.6	10	35	113.0	7.4
11	43	112.1	6.2	11	30	112.3	7.1
12	44	111.2	6.1	12	27	112.8	6.6
13	42	110.3	6.4	13	29	110.8	6.0
14	40	110.2	6.4	14	25	110.6	6.6
15	33	109.7	5.9	15	19	110.9	7.2
16	23	111.7	6.4	16	9	111.6	6.4



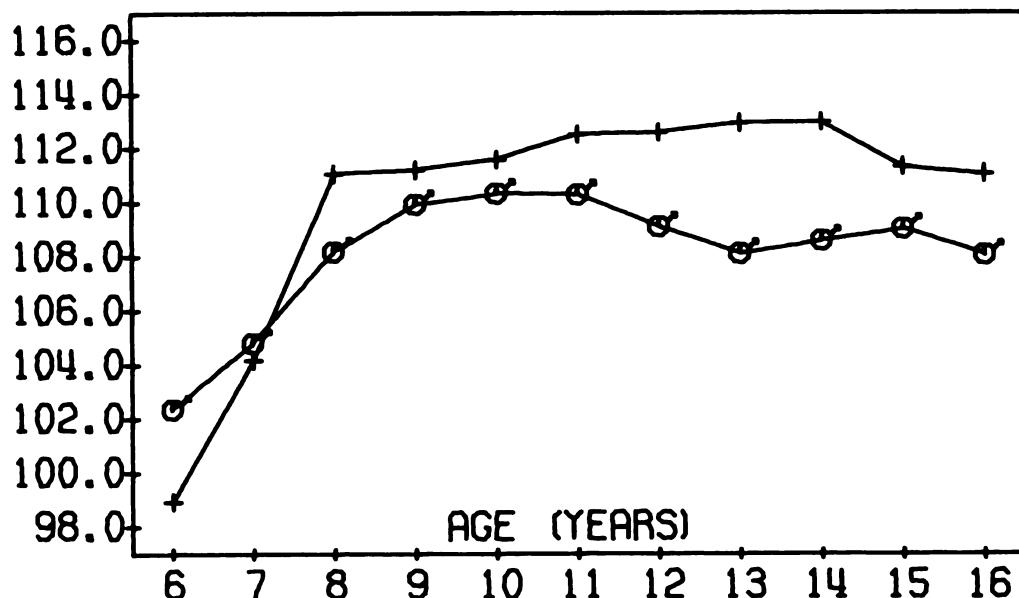
**ANGULAR MEASUREMENT  
Variable 54**



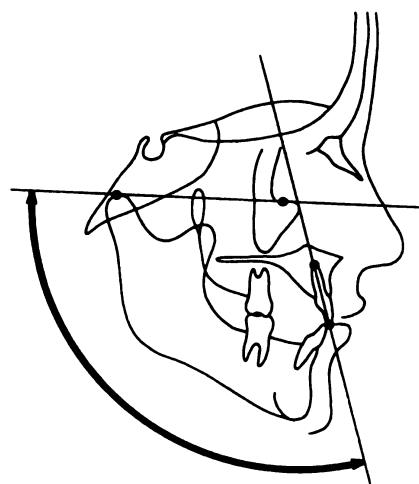
**Upper Incisor/Frankfort Plane**

**UIE-UIA/PO-OR      7-12/49-40**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	102.4	8.7	6	12	98.9	12.5
7	22	104.8	7.0	7	14	104.2	8.4
8	23	108.2	6.7	8	18	111.1	6.0
9	24	110.0	6.7	9	15	111.2	5.8
10	25	110.4	6.7	10	14	111.6	7.1
11	25	110.3	7.3	11	13	112.5	6.8
12	24	109.1	7.9	12	13	112.6	6.9
13	23	108.1	7.9	13	9	112.9	4.3
14	20	108.6	7.0	14	9	113.0	4.2
15	17	109.0	7.6	15	7	111.3	4.3
16	13	108.1	7.5	16	5	111.1	6.3



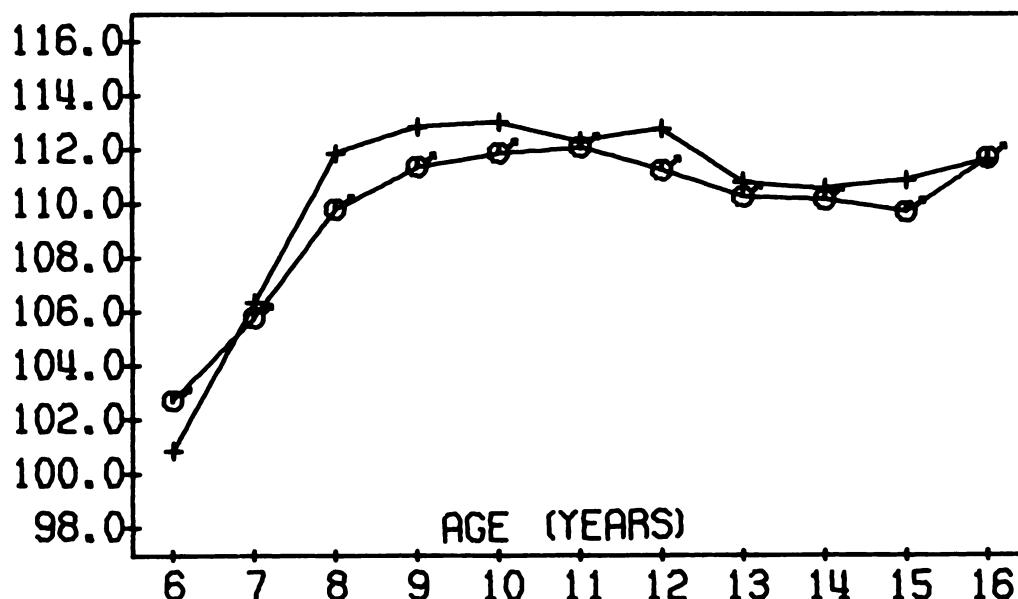
ANGULAR MEASUREMENT  
Variable 55



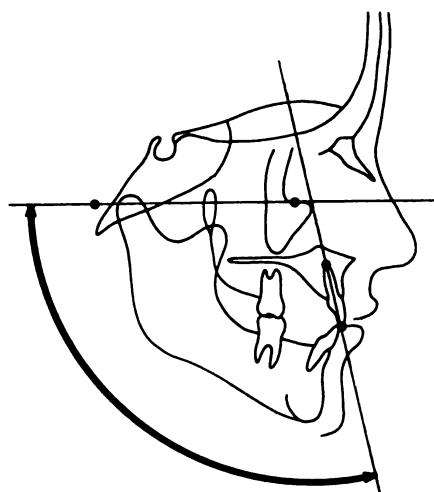
Upper Incisor/Condylar Plane

UIE-UIA/CU-OR 7-12/33-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	102.7	8.7	6	25	100.8	9.8
7	44	105.8	8.8	7	31	106.4	9.2
8	44	109.8	7.0	8	36	111.9	7.4
9	46	111.4	5.3	9	31	112.9	6.2
10	45	111.9	5.6	10	35	113.0	7.4
11	43	112.1	6.2	11	30	112.3	7.1
12	44	111.2	6.1	12	27	112.8	6.6
13	42	110.3	6.4	13	29	110.8	6.0
14	40	110.2	6.4	14	25	110.6	6.6
15	33	109.7	5.9	15	19	110.9	7.2
16	23	111.7	6.4	16	9	111.6	6.4



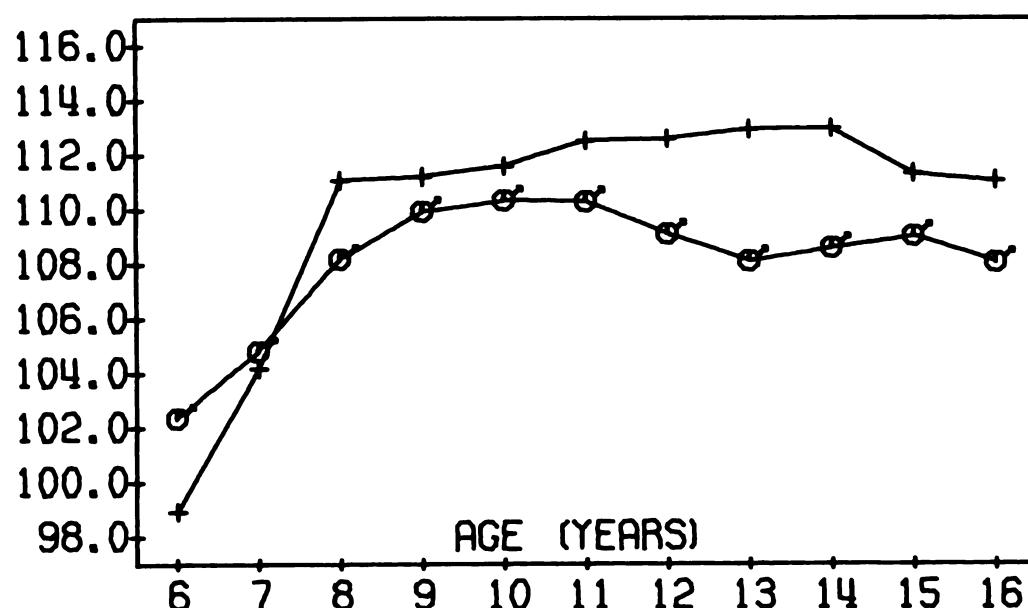
**ANGULAR MEASUREMENT  
Variable 54**



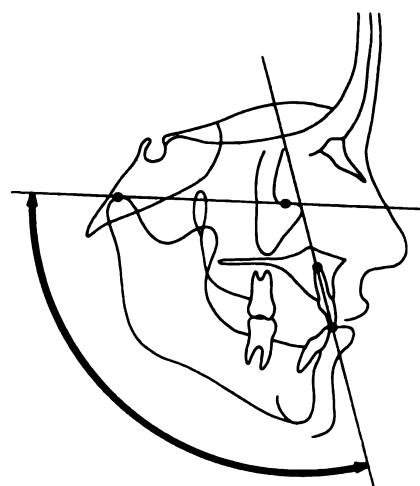
**Upper Incisor/Frankfort Plane**

**UIE-UIA/PO-OR      7-12/49-40**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	102.4	8.7	6	12	98.9	12.5
7	22	104.8	7.0	7	14	104.2	8.4
8	23	108.2	6.7	8	18	111.1	6.0
9	24	110.0	6.7	9	15	111.2	5.8
10	25	110.4	6.7	10	14	111.6	7.1
11	25	110.3	7.3	11	13	112.5	6.8
12	24	109.1	7.9	12	13	112.6	6.9
13	23	108.1	7.9	13	9	112.9	4.3
14	20	108.6	7.0	14	9	113.0	4.2
15	17	109.0	7.6	15	7	111.3	4.3
16	13	108.1	7.5	16	5	111.1	6.3



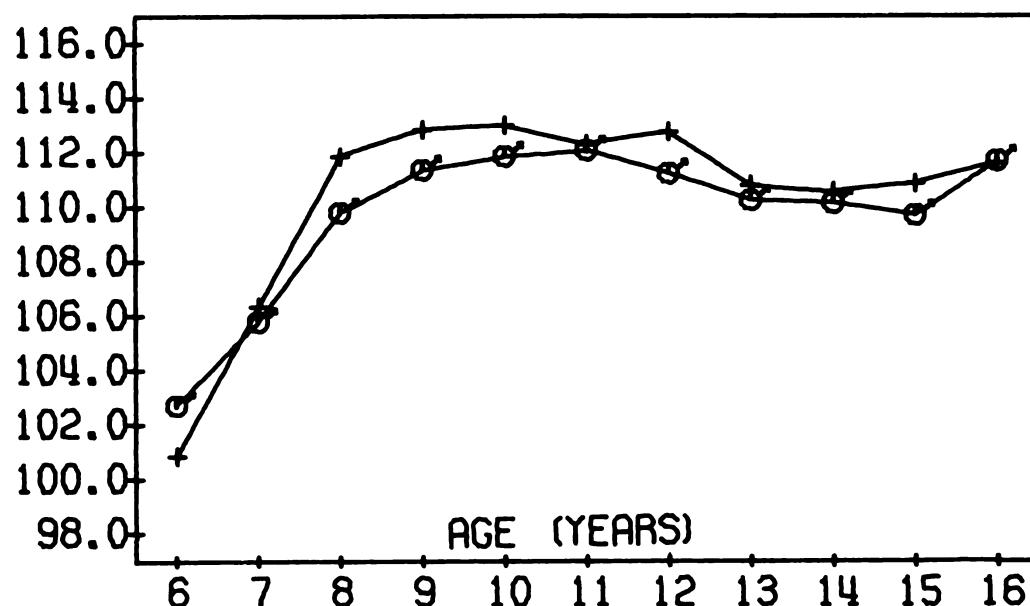
ANGULAR MEASUREMENT  
Variable 55



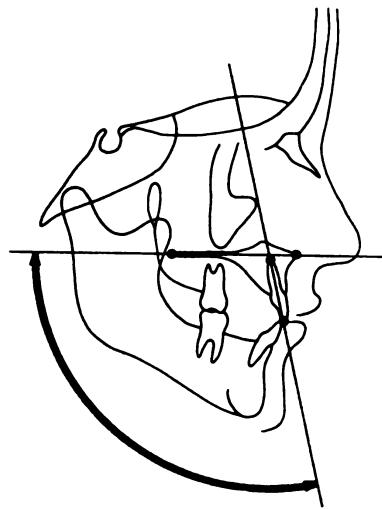
Upper Incisor/Condylar Plane

UIE-UIA/CU-OR 7-12/33-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	102.7	8.7	6	25	100.8	9.8
7	44	105.8	8.8	7	31	106.4	9.2
8	44	109.8	7.0	8	36	111.9	7.4
9	46	111.4	5.3	9	31	112.9	6.2
10	45	111.9	5.6	10	35	113.0	7.4
11	43	112.1	6.2	11	30	112.3	7.1
12	44	111.2	6.1	12	27	112.8	6.6
13	42	110.3	6.4	13	29	110.8	6.0
14	40	110.2	6.4	14	25	110.6	6.6
15	33	109.7	5.9	15	19	110.9	7.2
16	23	111.7	6.4	16	9	111.6	6.4



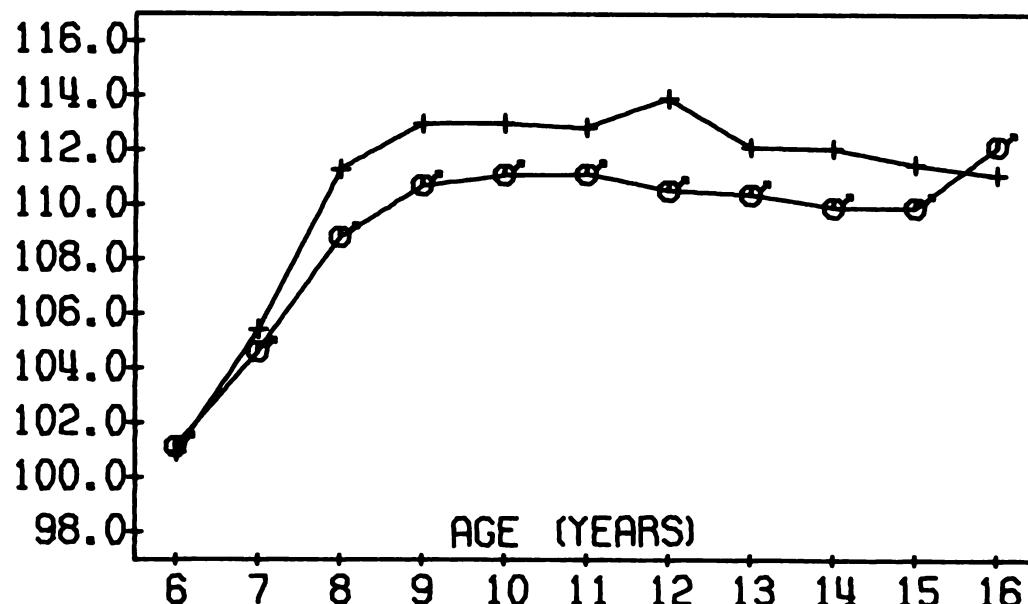
ANGULAR MEASUREMENT  
Variable 56



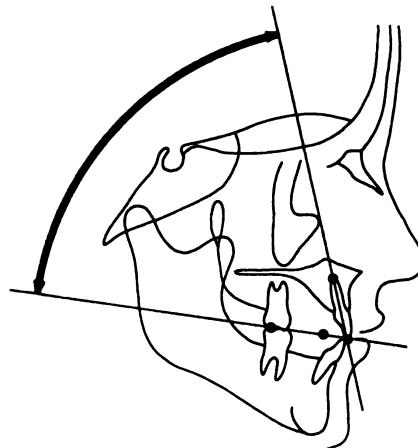
Upper Incisor/Palatal Plane

UIE-UIA/PNS-ANS 7-12/45-10

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	101.1	8.0	6	24	100.9	9.5
7	44	104.6	8.2	7	31	105.4	10.0
8	44	108.8	6.7	8	36	111.3	7.1
9	47	110.7	5.0	9	31	113.0	6.6
10	46	111.1	5.2	10	35	113.0	7.5
11	43	111.1	5.7	11	30	112.8	7.0
12	44	110.5	5.5	12	27	113.9	5.9
13	43	110.4	5.7	13	29	112.1	5.7
14	39	109.9	5.4	14	25	112.1	6.1
15	33	109.9	5.8	15	19	111.5	6.7
16	23	112.1	5.7	16	9	111.1	6.2



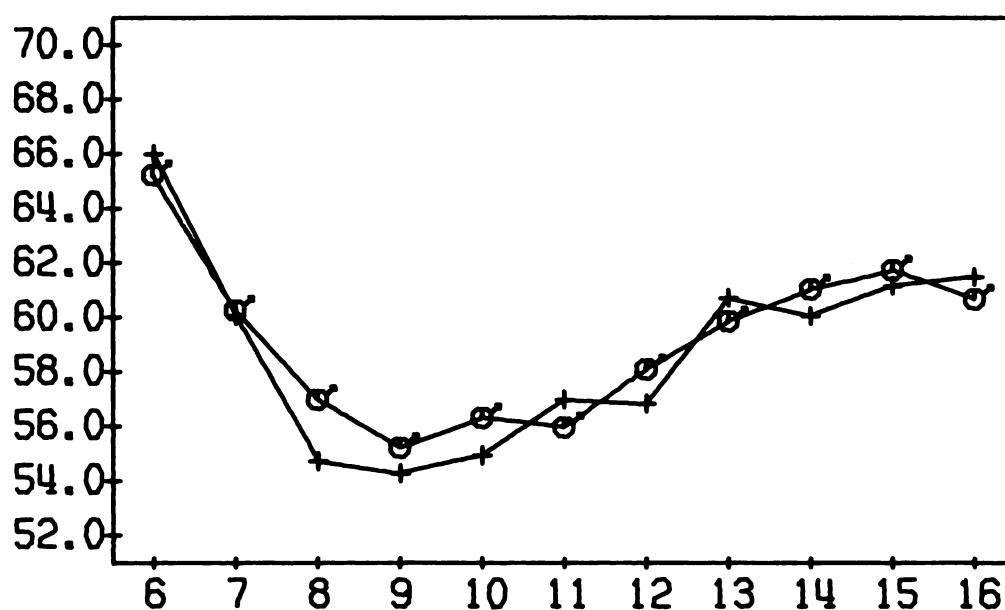
**ANGULAR MEASUREMENT  
Variable 57**



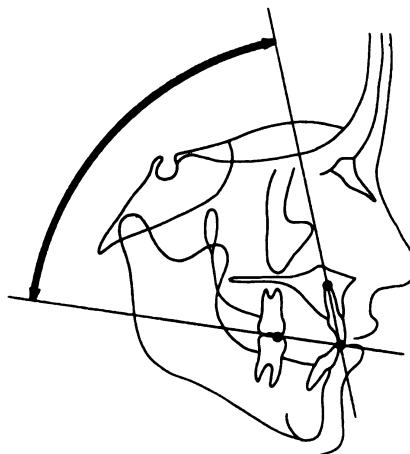
Upper Incisor/Functional  
Occlusal Plane

FPP-PMC/UIA-UIE 50-46/12-7

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	36	65.2	10.0	6	25	66.0	9.7
7	43	60.3	9.1	7	31	60.1	10.0
8	44	57.0	7.8	8	36	54.7	6.9
9	47	55.2	5.5	9	30	54.3	6.2
10	46	56.3	6.3	10	35	54.9	7.6
11	43	56.0	6.1	11	30	57.0	7.8
12	44	58.1	5.9	12	27	56.8	6.5
13	42	59.9	6.2	13	29	60.7	6.0
14	39	61.0	6.0	14	25	60.1	4.7
15	32	61.7	6.7	15	19	61.2	6.0
16	23	60.7	7.1	16	9	61.5	6.0



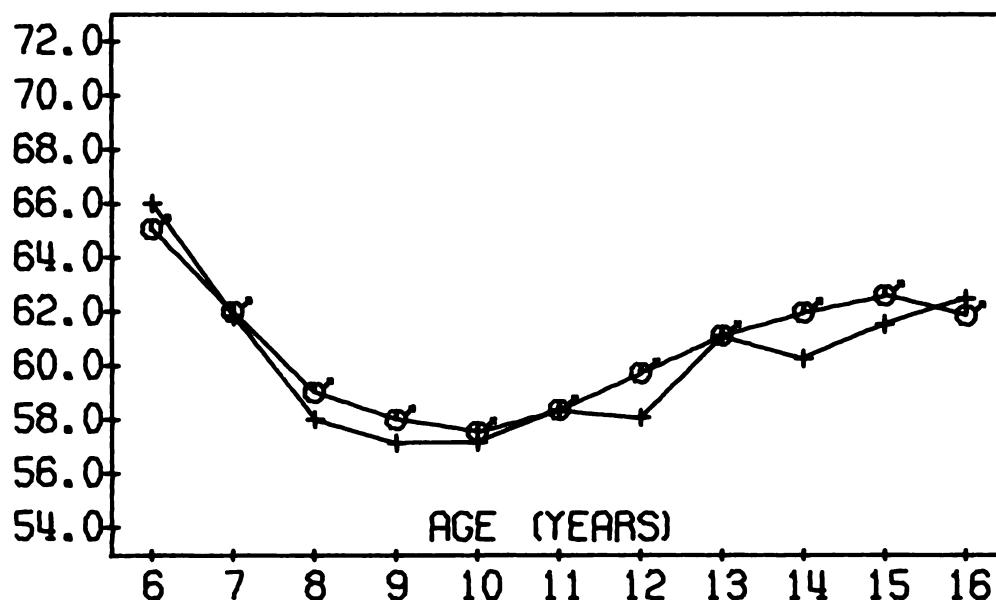
ANGULAR MEASUREMENT  
Variable 58



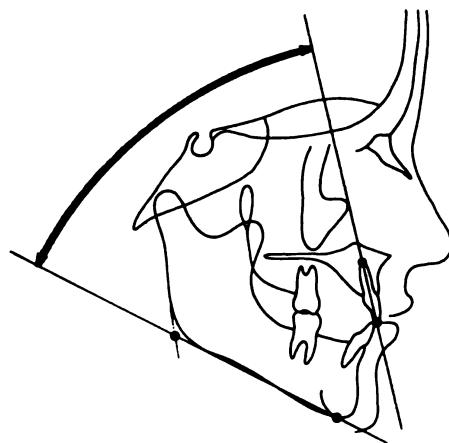
Upper Incisor/Downs Occlusal  
Plane

PDP-ADP/UIA-UIC 57-56/12-7

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	65.1	7.0	6	25	66.0	9.8
7	44	62.0	8.0	7	31	61.9	8.0
8	44	59.0	6.6	8	36	58.0	5.3
9	47	58.0	5.1	9	31	57.1	4.9
10	46	57.6	4.9	10	35	57.2	6.1
11	43	58.4	5.7	11	30	58.4	5.8
12	44	59.7	5.3	12	27	58.1	5.1
13	43	61.1	6.0	13	29	61.1	4.9
14	40	62.0	5.6	14	25	60.3	3.9
15	33	62.6	5.4	15	19	61.6	5.0
16	23	61.9	6.1	16	9	62.5	5.0



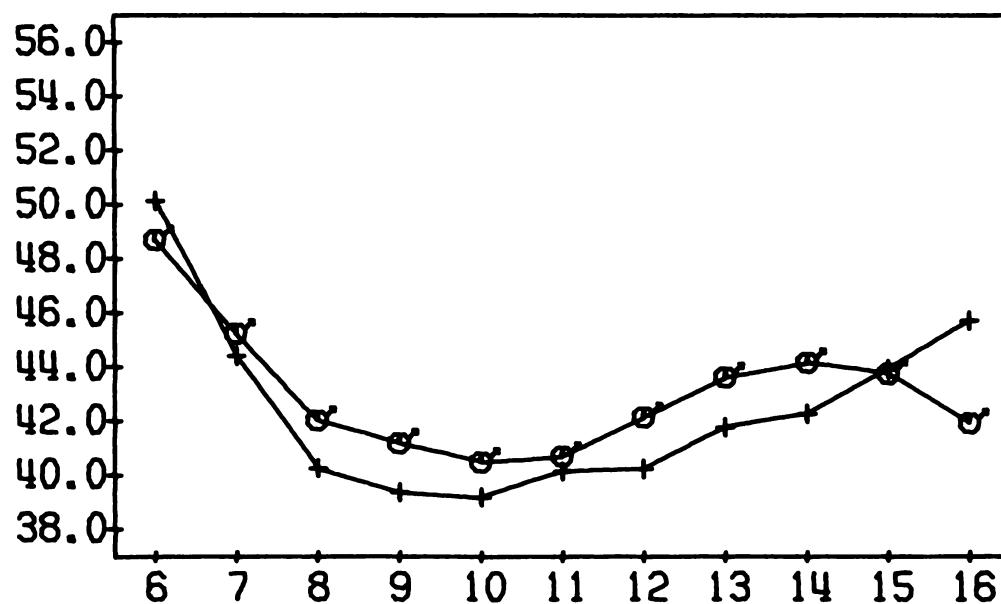
**ANGULAR MEASUREMENT  
Variable 59**



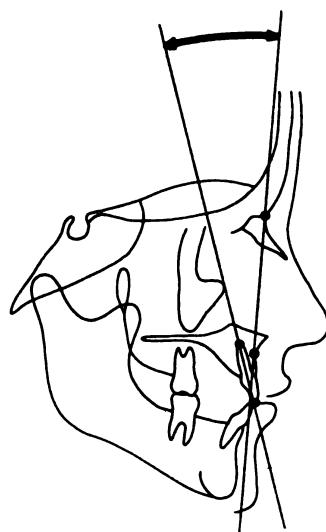
**Upper Incisor/Mandibular Plane**

**GOI-ME/UIA-UIE 28-1/12-7**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	48.7	9.3	6	25	50.2	11.2
7	44	45.3	9.9	7	31	44.4	9.1
8	44	42.0	7.8	8	36	40.3	6.7
9	46	41.2	6.7	9	31	39.4	6.0
10	45	40.5	6.9	10	35	39.2	5.6
11	43	40.7	7.0	11	30	40.1	6.0
12	44	42.2	7.2	12	27	40.3	6.2
13	42	43.6	7.9	13	29	41.8	6.0
14	39	44.2	7.2	14	25	42.3	5.6
15	32	43.8	7.1	15	19	43.9	6.9
16	23	41.9	7.4	16	9	45.7	7.1



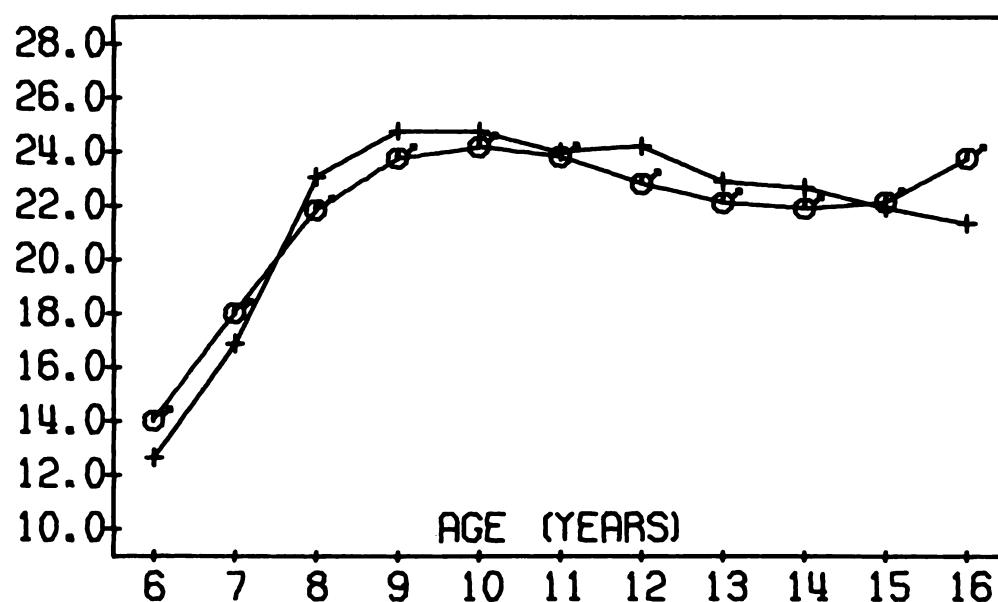
ANGULAR MEASUREMENT  
Variable 60



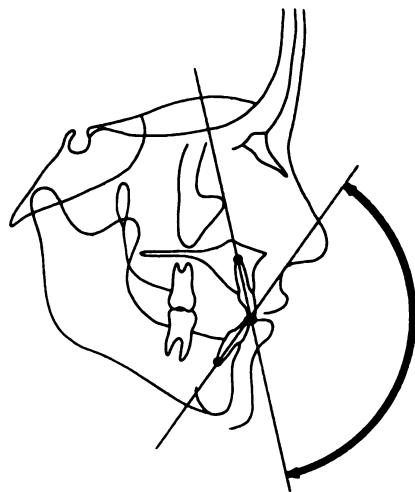
Upper Incisor/Nasion-A Point  
Steiner Analysis

UIA-UIE/N-A 12-7/38-9

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	14.0	8.1	6	25	12.6	9.5
7	44	18.0	8.3	7	31	16.9	9.9
8	44	21.9	6.6	8	36	23.1	6.1
9	47	23.8	4.9	9	31	24.8	6.0
10	46	24.2	5.3	10	35	24.8	7.0
11	43	23.8	6.0	11	30	24.0	6.1
12	44	22.8	5.7	12	27	24.2	6.5
13	43	22.1	5.8	13	29	22.9	5.4
14	40	21.9	5.6	14	25	22.7	5.4
15	33	22.1	5.8	15	19	21.9	7.0
16	23	23.8	6.1	16	9	21.4	6.9



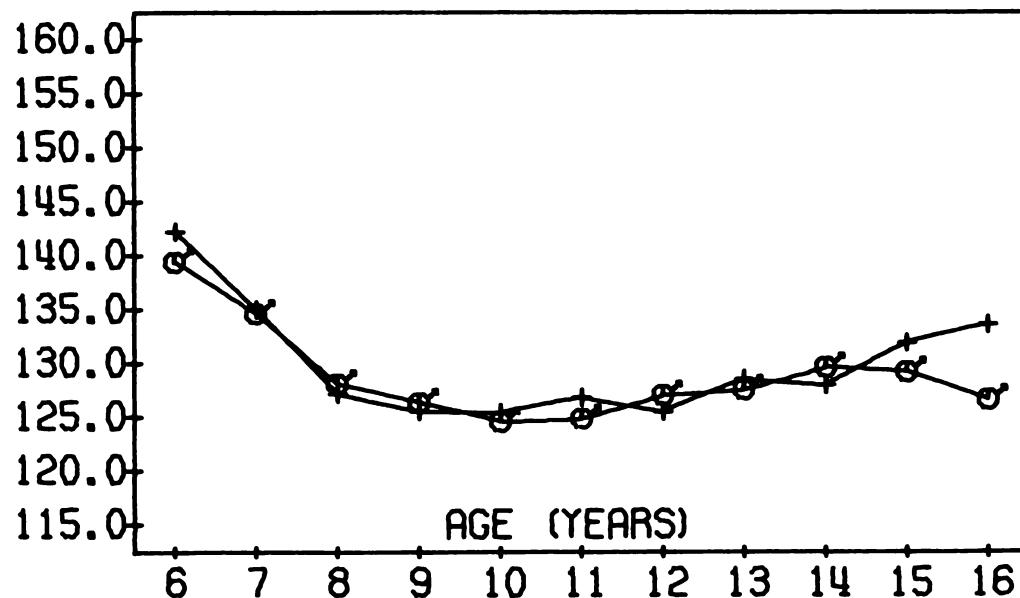
ANGULAR MEASUREMENT  
Variable 61



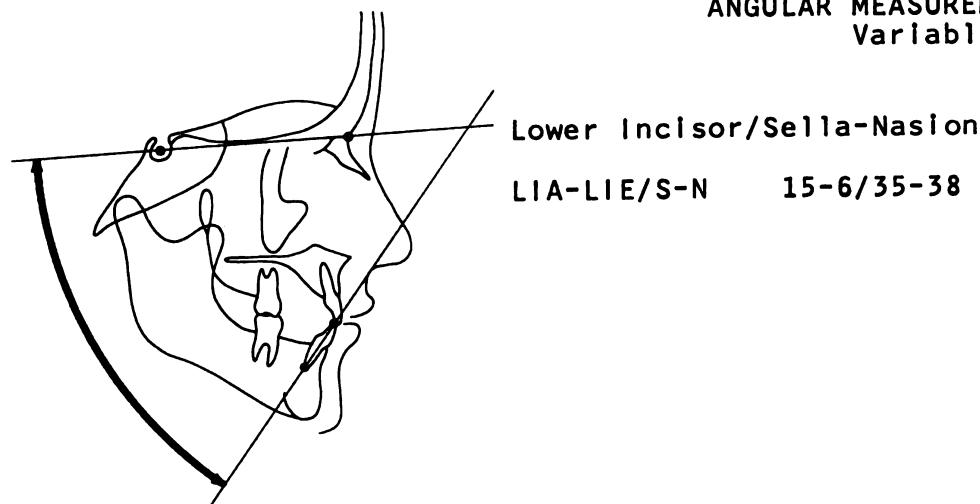
Lower Incisor/Upper Incisor  
Downs-Steiner Analyses

LIA-LIE/UIA-UIE 15-6/12-7

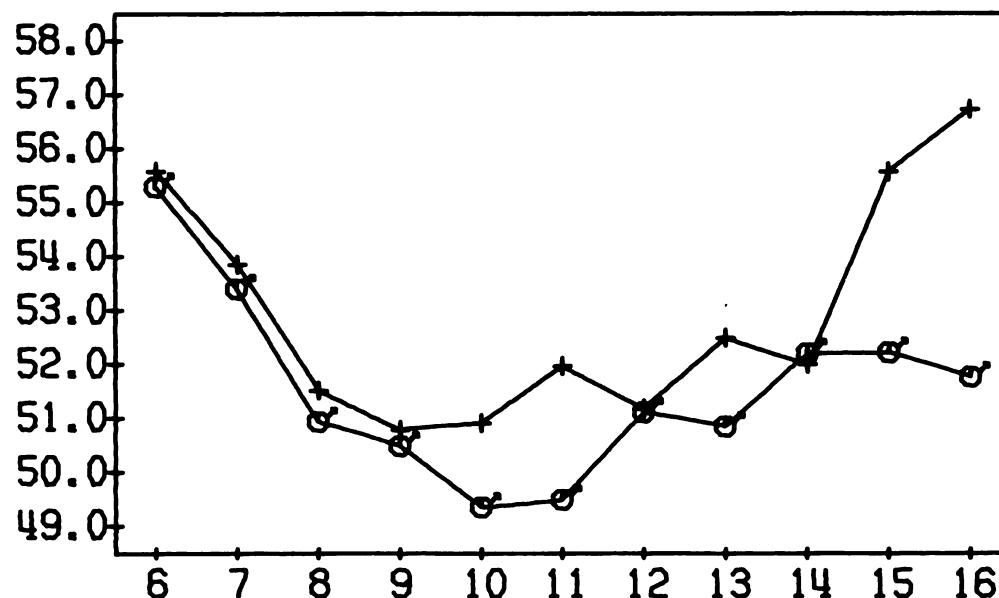
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	139.4	13.4	6	25	142.2	14.2
7	43	134.6	13.2	7	31	135.0	13.6
8	44	128.1	11.2	8	36	127.2	10.2
9	46	126.3	9.2	9	31	125.5	9.7
10	45	124.6	8.6	10	35	125.4	8.9
11	43	124.9	9.1	11	30	126.9	9.1
12	44	127.1	9.7	12	27	125.5	10.0
13	43	127.6	10.9	13	29	128.6	8.4
14	40	129.6	10.8	14	25	128.0	9.5
15	33	129.2	10.1	15	19	131.9	10.3
16	23	126.6	10.0	16	9	133.6	13.0



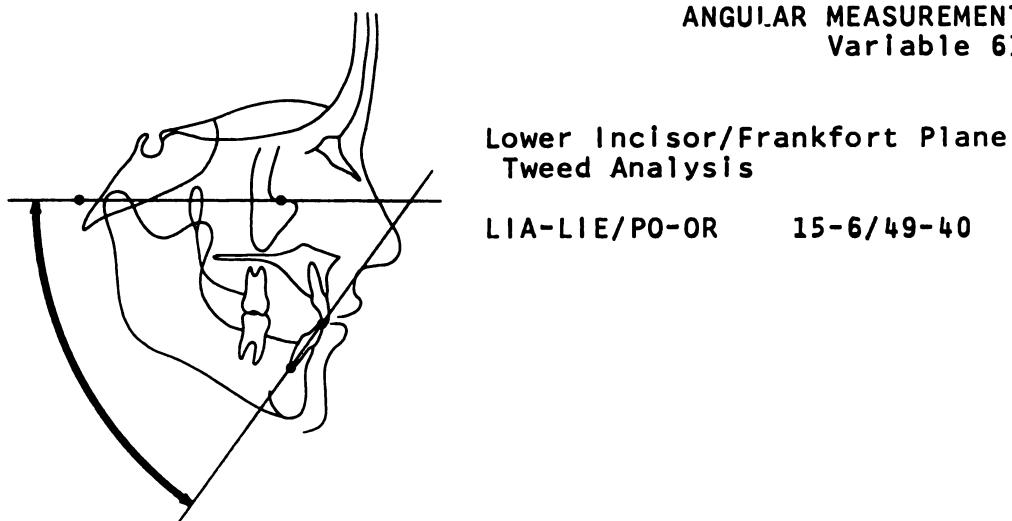
ANGULAR MEASUREMENT  
Variable 62



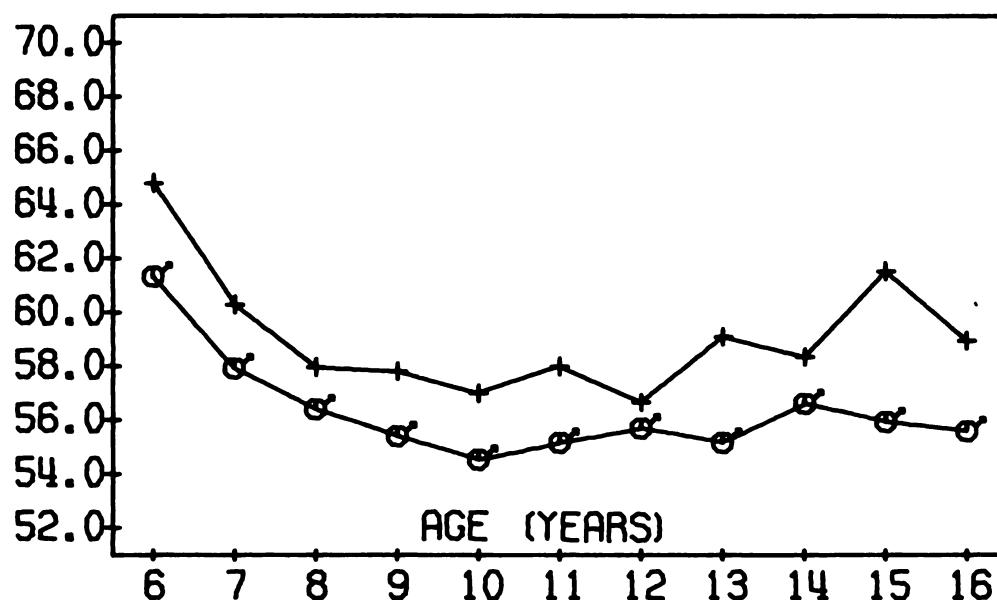
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	55.3	7.7	6	25	55.6	8.4
7	43	53.4	7.8	7	31	53.9	7.8
8	44	50.9	6.8	8	36	51.5	7.2
9	46	50.5	6.2	9	31	50.8	7.0
10	45	49.4	6.2	10	35	50.9	6.9
11	43	49.5	6.7	11	30	52.0	7.3
12	44	51.1	7.0	12	27	51.2	7.2
13	43	50.8	8.0	13	29	52.5	8.2
14	40	52.2	7.8	14	25	52.0	8.9
15	33	52.2	7.3	15	19	55.6	8.5
16	23	51.8	7.6	16	9	56.7	9.0



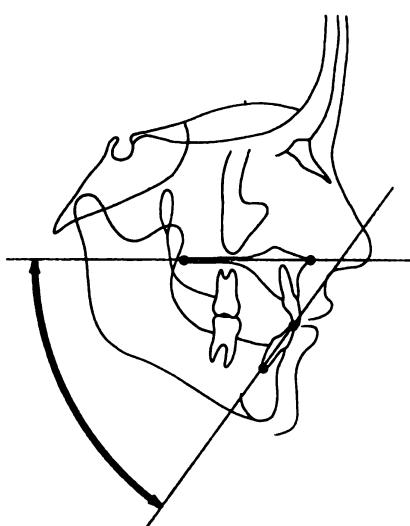
ANGULAR MEASUREMENT  
Variable 63



Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	61.3	8.1	6	12	64.8	7.5
7	22	57.9	9.6	7	14	60.3	9.2
8	23	56.4	7.7	8	18	58.0	9.1
9	23	55.4	7.0	9	15	57.8	7.7
10	24	54.5	6.7	10	14	57.0	7.5
11	25	55.2	6.8	11	13	58.0	5.7
12	24	55.7	6.3	12	13	56.7	7.7
13	23	55.2	7.0	13	9	59.1	6.3
14	20	56.6	8.2	14	9	58.3	9.4
15	17	55.9	8.1	15	7	61.5	9.2
16	13	55.6	8.2	16	5	59.0	10.7

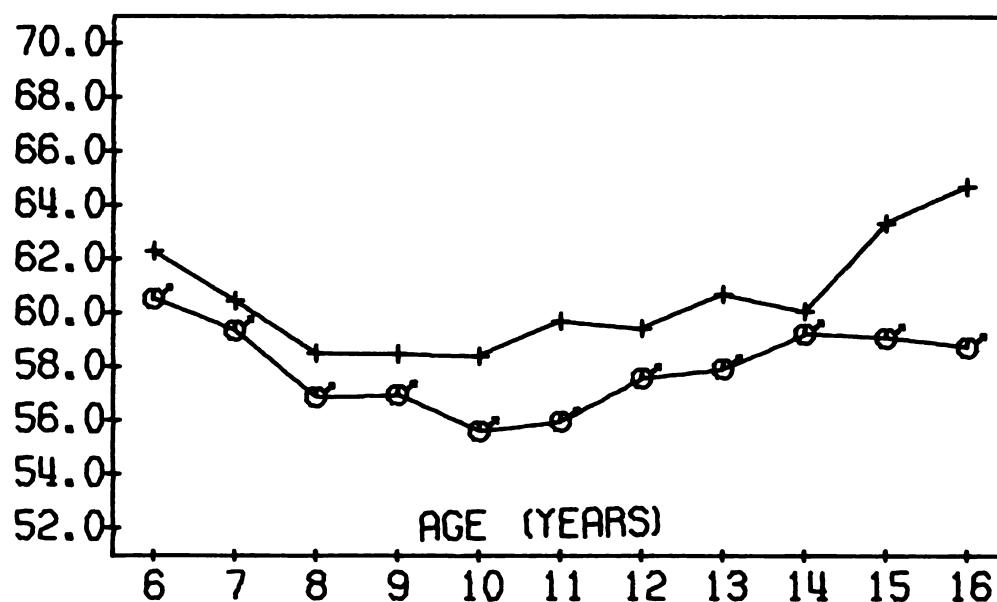


ANGULAR MEASUREMENT  
Variable 64

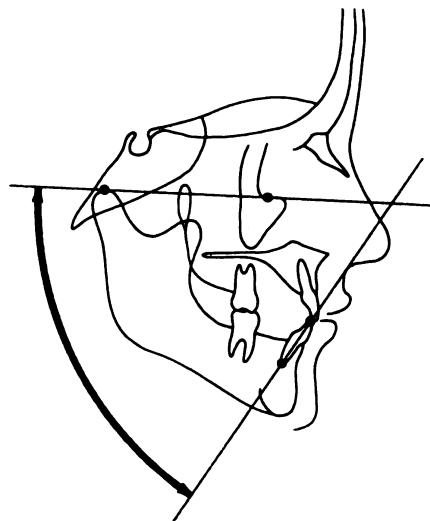


Lower Incisor/Palatal Plane  
LIA-LIE/PNS-ANS 15-6/45-10

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	60.5	8.3	6	24	62.3	9.1
7	43	59.4	8.0	7	31	60.5	8.2
8	44	56.9	6.7	8	36	58.5	7.1
9	46	57.0	6.2	9	31	58.5	7.2
10	45	55.6	5.8	10	35	58.4	7.3
11	43	56.0	6.3	11	30	59.7	7.4
12	44	57.6	7.1	12	27	59.5	7.9
13	43	57.9	7.8	13	29	60.7	7.8
14	39	59.2	7.8	14	25	60.1	9.1
15	33	59.1	6.7	15	19	63.4	9.1
16	23	58.7	7.7	16	9	64.7	10.7

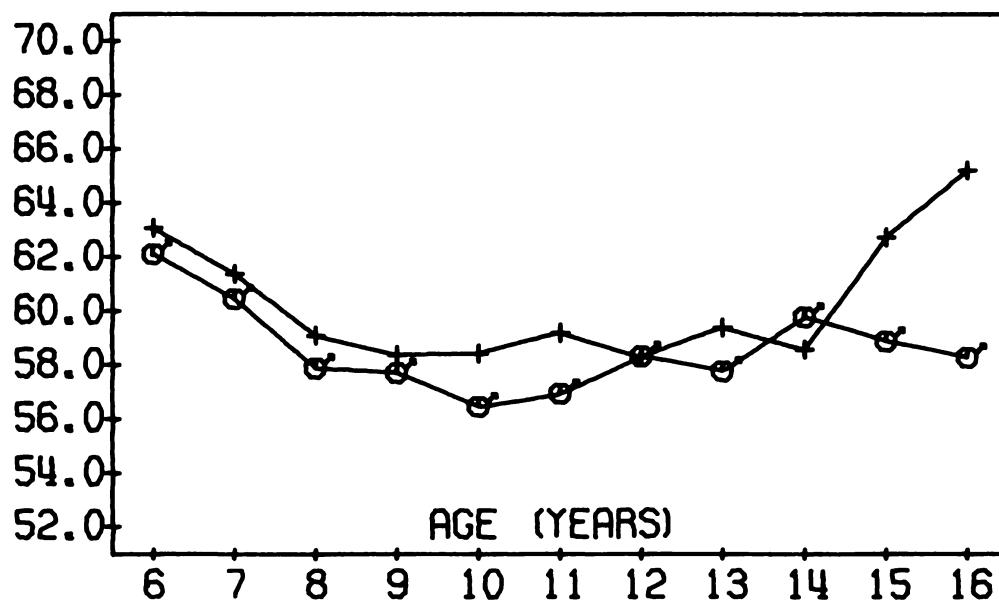


ANGULAR MEASUREMENT  
Variable 65

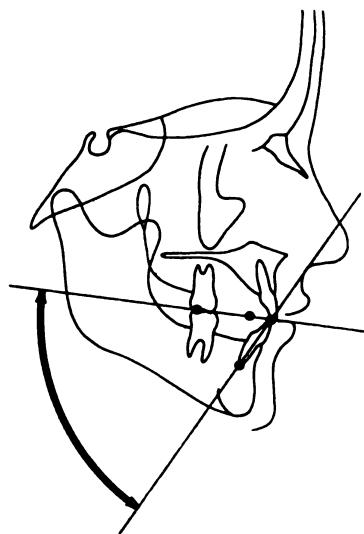


Lower Incisor/Condylar Plane  
LIA-LIE/CO-OR 15-6/33-40

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	62.1	7.8	6	25	63.1	7.6
7	43	60.5	7.9	7	31	61.4	8.1
8	44	57.9	6.8	8	36	59.1	6.8
9	46	57.7	6.4	9	31	58.4	6.8
10	45	56.5	6.4	10	35	58.4	6.2
11	43	57.0	6.5	11	30	59.2	6.2
12	44	58.3	7.1	12	27	58.3	6.6
13	42	57.8	8.0	13	29	59.4	7.4
14	40	59.8	8.0	14	25	58.6	7.9
15	33	58.9	7.1	15	19	62.7	7.9
16	23	58.3	7.3	*	16	9	65.2
				*			10.9



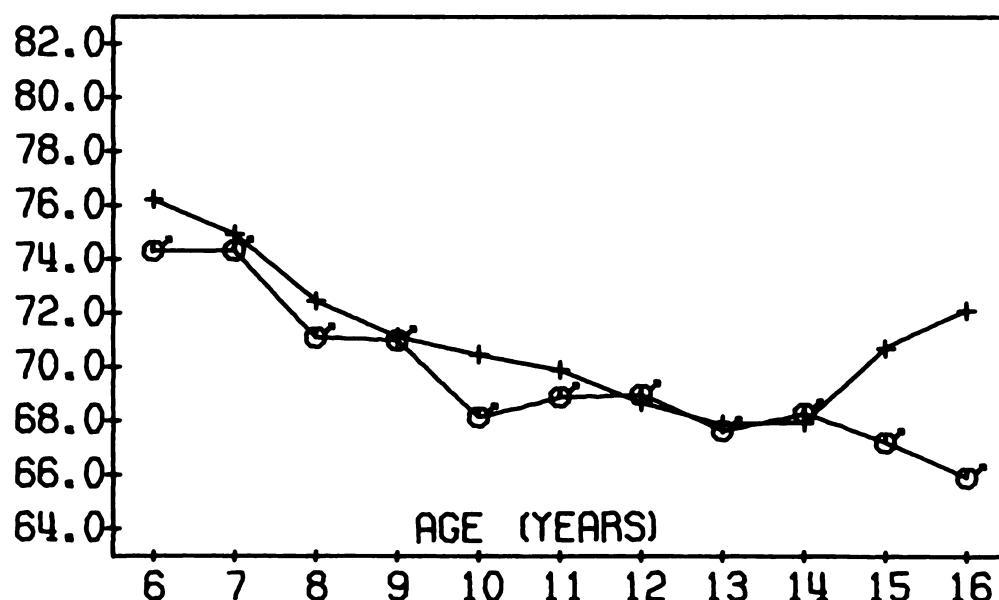
ANGULAR MEASUREMENT  
Variable 66



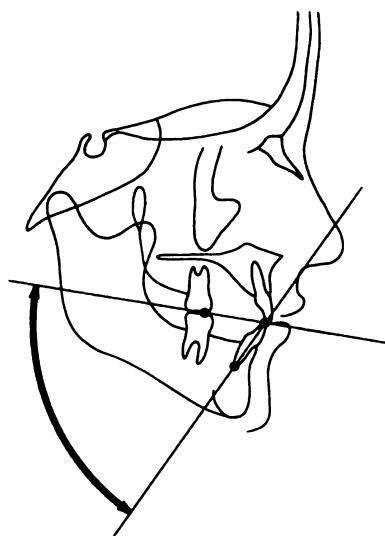
Lower Incisor/Functional  
Occlusal Plane

LIA-LIE/FPP-PMC 15-6/50-46

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	36	74.3	7.3	6	25	76.2	9.4
7	42	74.3	7.8	7	31	75.0	8.8
8	44	71.1	6.3	8	36	72.5	7.6
9	46	71.0	5.7	9	30	71.2	7.5
10	45	68.2	5.9	10	35	70.5	7.5
11	43	68.9	5.9	11	30	69.9	6.3
12	44	69.0	6.9	12	27	68.7	6.6
13	42	67.7	8.1	13	29	67.9	7.5
14	39	68.3	7.7	14	25	68.0	8.1
15	32	67.2	6.8	15	19	70.7	7.8
16	23	65.9	7.5	16	9	72.1	9.8



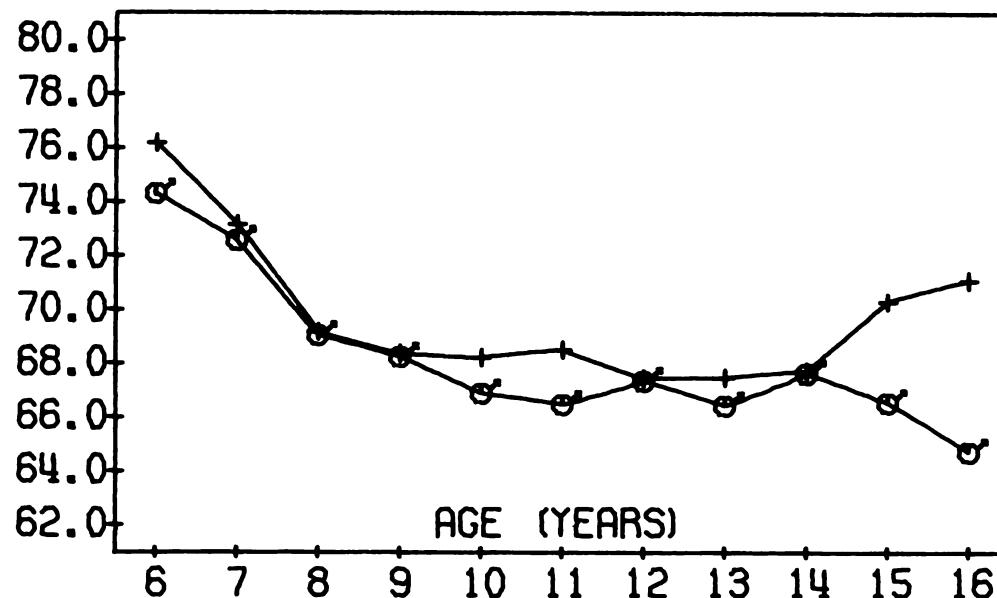
ANGULAR MEASUREMENT  
Variable 67

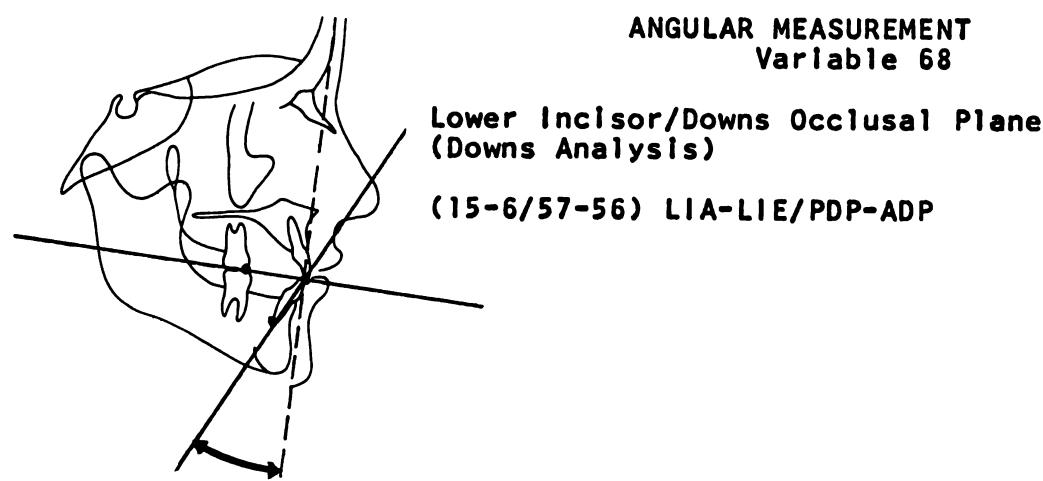


Lower Incisor/Downs Occlusal  
Plane

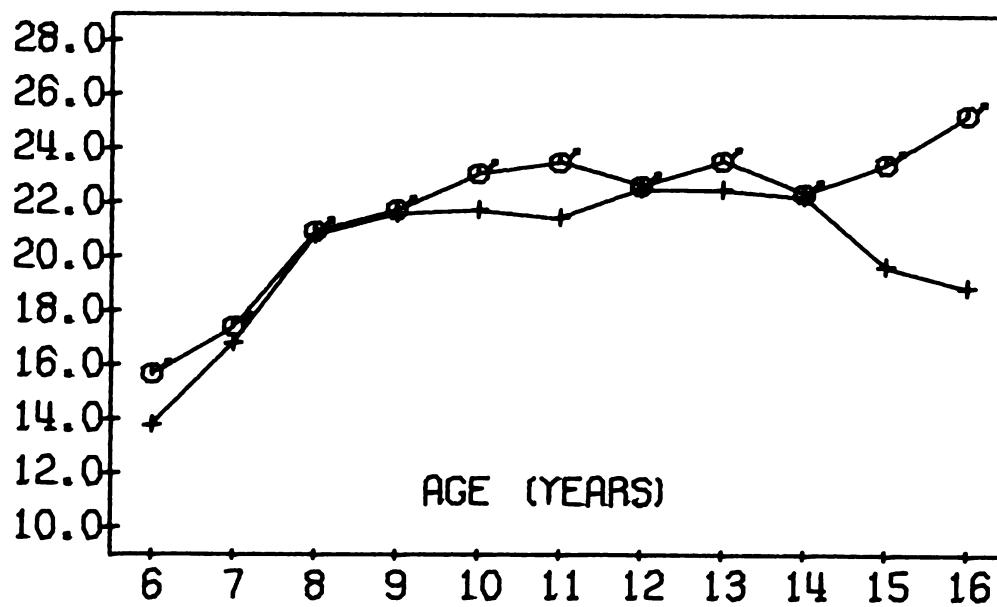
LIA-LIE/PDP-ADP 15-6/57-56

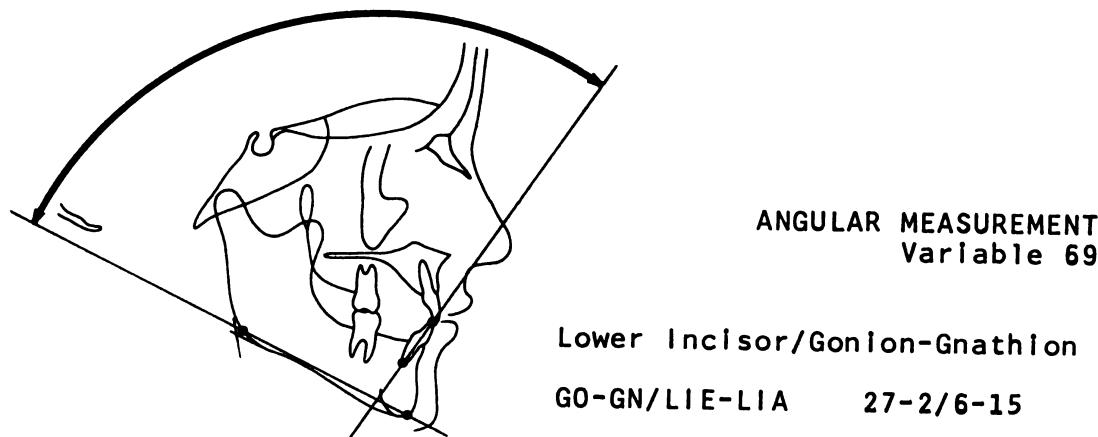
Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	74.3	8.4	6	25	76.2	8.7
7	43	72.6	7.6	7	31	73.2	7.9
8	44	69.0	6.1	8	36	69.2	6.9
9	46	68.3	5.6	9	31	68.4	6.8
10	45	66.9	5.5	10	35	68.2	6.9
11	43	66.5	5.6	11	30	68.5	6.4
12	44	67.3	6.4	12	27	67.4	6.9
13	43	66.4	6.6	13	29	67.5	7.2
14	40	67.6	6.9	14	25	67.7	7.4
15	33	66.6	6.3	15	19	70.3	7.4
16	23	64.7	6.8	*	16	9	71.1
							10.1



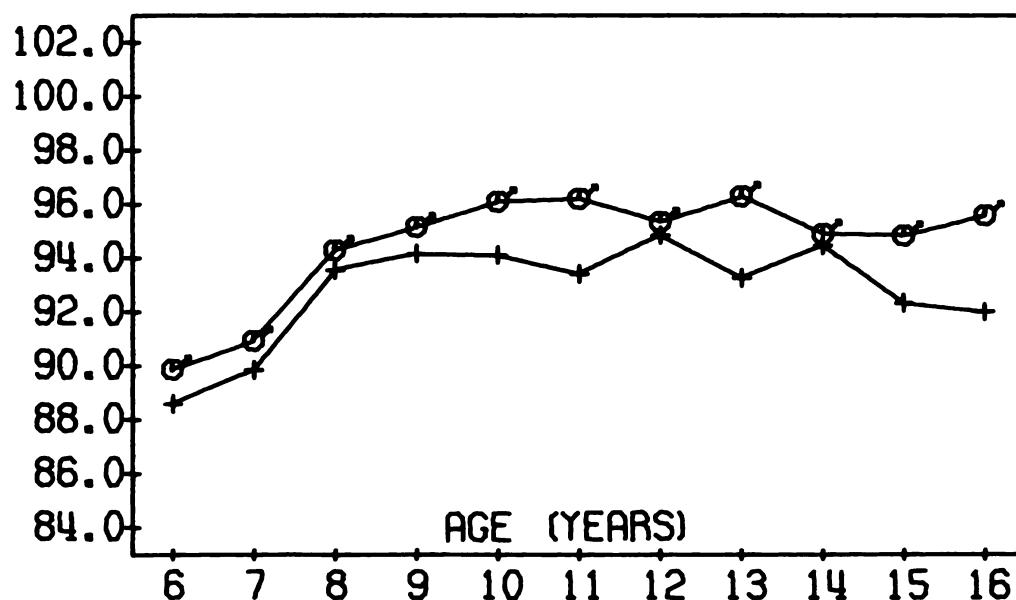


Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	15.7	8.4	6	25	13.8	8.7
7	43	17.4	7.6	7	31	16.8	7.9
8	44	21.0	6.1	8	36	20.8	6.9
9	46	21.7	5.6	9	31	21.6	6.8
10	45	23.1	5.5	10	35	21.8	6.9
11	43	23.5	5.6	11	30	21.5	6.4
12	44	22.7	6.4	12	27	22.6	6.9
13	43	23.6	6.6	13	29	22.5	7.2
14	40	22.4	6.9	14	25	22.3	7.4
15	33	23.4	6.3	15	19	19.7	7.4
16	23	25.3	6.8	16	9	18.9	10.1

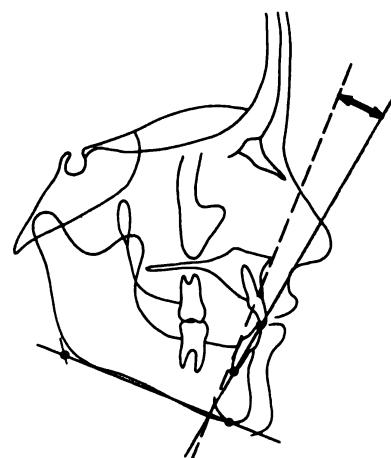




Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	89.9	6.7	6	25	88.6	7.2
7	43	91.0	6.5	7	31	89.9	8.0
8	44	94.3	5.7	8	36	93.6	6.8
9	47	95.2	5.7	9	31	94.2	7.0
10	46	96.1	5.0	10	35	94.1	6.7
11	43	96.2	5.3	* 11	30	93.4	5.8
12	44	95.4	5.8	12	27	94.9	6.6
13	43	96.3	6.9	13	29	93.3	5.7
14	40	94.9	7.2	14	25	94.5	6.9
15	33	94.8	6.8	15	19	92.3	6.5
16	23	95.6	6.6	16	9	92.0	9.4



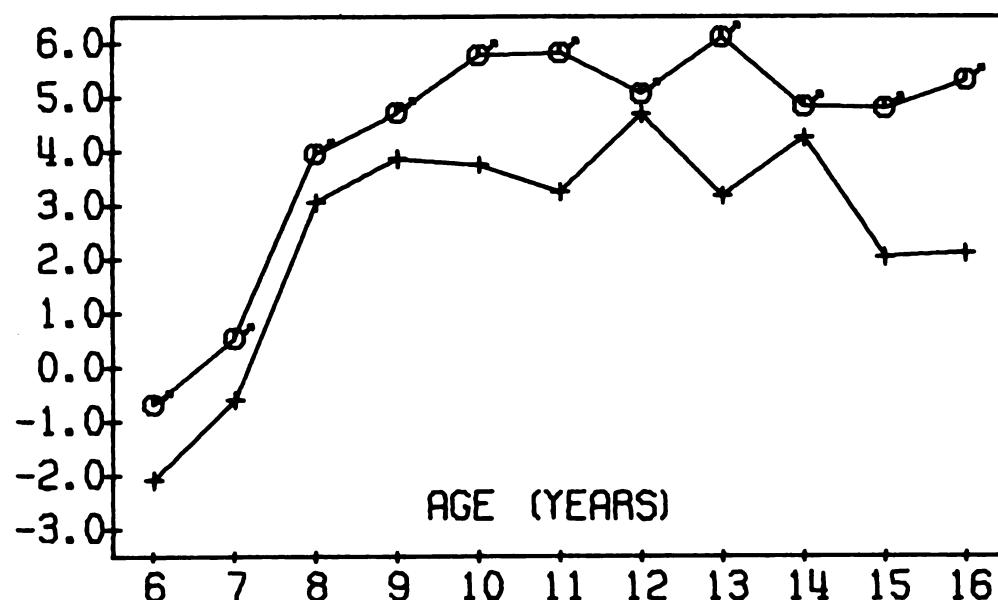
ANGULAR MEASUREMENT  
Variable 70

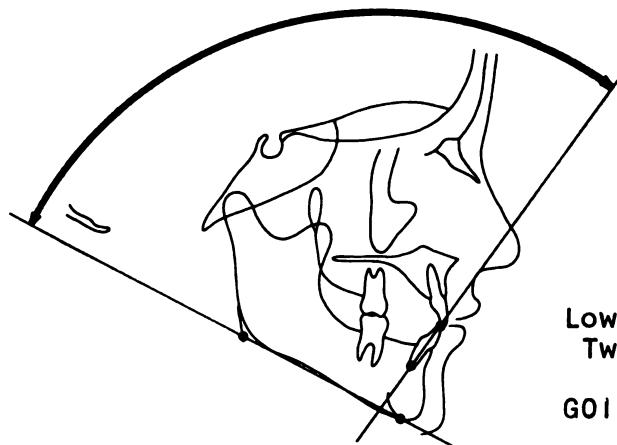


Lower Incisor/Mandibular Plane  
Downs Analysis

GOI-ME/LIE-LIA      28-1/6-15|  
-90 deg

Age	N	Male		Female			
		Mean deg.	S.D. deg.	Mean deg.	S.D. deg.		
6	37	-0.7	6.8	6	25	-2.1	7.2
7	43	0.5	6.5	7	31	-0.6	8.1
8	44	4.0	5.7	8	36	3.1	7.0
9	47	4.7	5.7	9	31	3.9	7.2
10	46	5.8	5.1	10	35	3.8	6.8
11	43	5.8	5.4	11	30	3.3	6.0
12	44	5.1	5.9	12	27	4.7	6.5
13	42	6.1	7.1	13	29	3.2	6.0
14	39	4.8	7.2	14	25	4.3	6.8
15	32	4.8	7.1	15	19	2.0	6.4
16	23	5.3	6.6	16	9	2.1	9.0



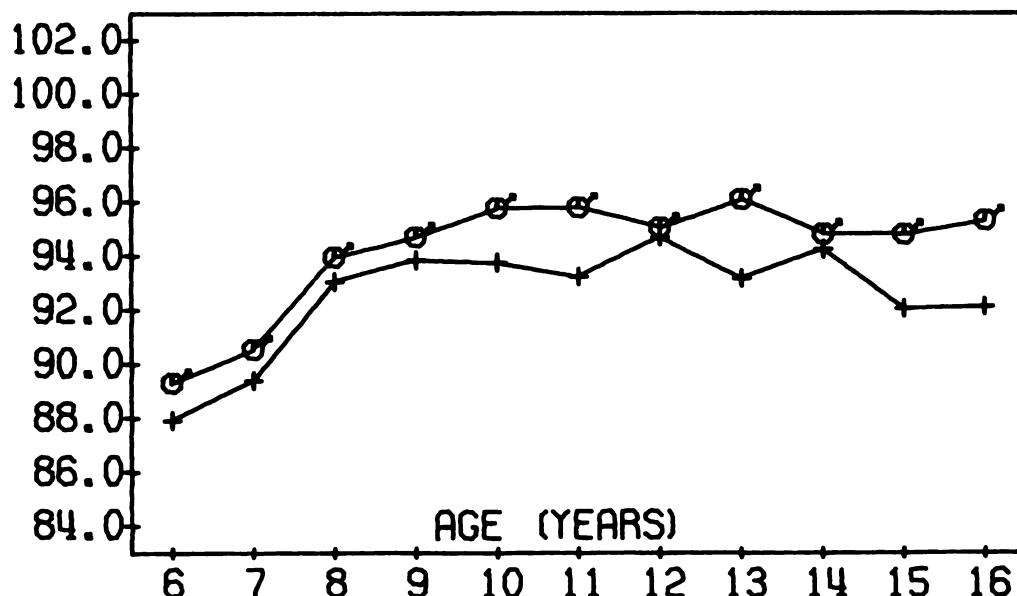


**ANGULAR MEASUREMENT  
Variable 71**

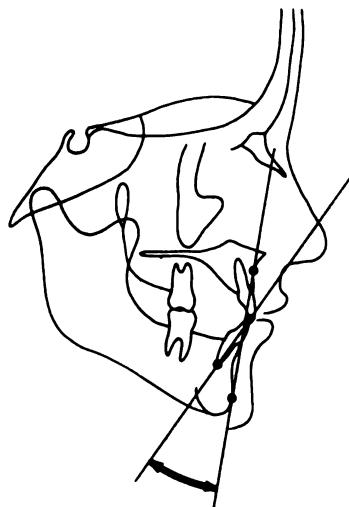
**Lower Incisor/Mandibular Plane  
Tweed Analysis**

**GOI-ME/LIE-LIA      28-1/6-15**

Age	N	Male		Female			
		Mean deg.	S.D. deg.	Mean deg.	S.D. deg.		
6	37	89.3	6.8	6	25	87.9	7.2
7	43	90.5	6.5	7	31	89.4	8.1
8	44	94.0	5.7	8	36	93.1	7.0
9	47	94.7	5.7	9	31	93.9	7.2
10	46	95.8	5.1	10	35	93.8	6.8
11	43	95.8	5.4	11	30	93.3	6.0
12	44	95.1	5.9	12	27	94.7	6.5
13	42	96.1	7.1	13	29	93.2	6.0
14	39	94.8	7.2	14	25	94.3	6.8
15	32	94.8	7.1	15	19	92.0	6.4
16	23	95.3	6.6	16	9	92.1	9.0



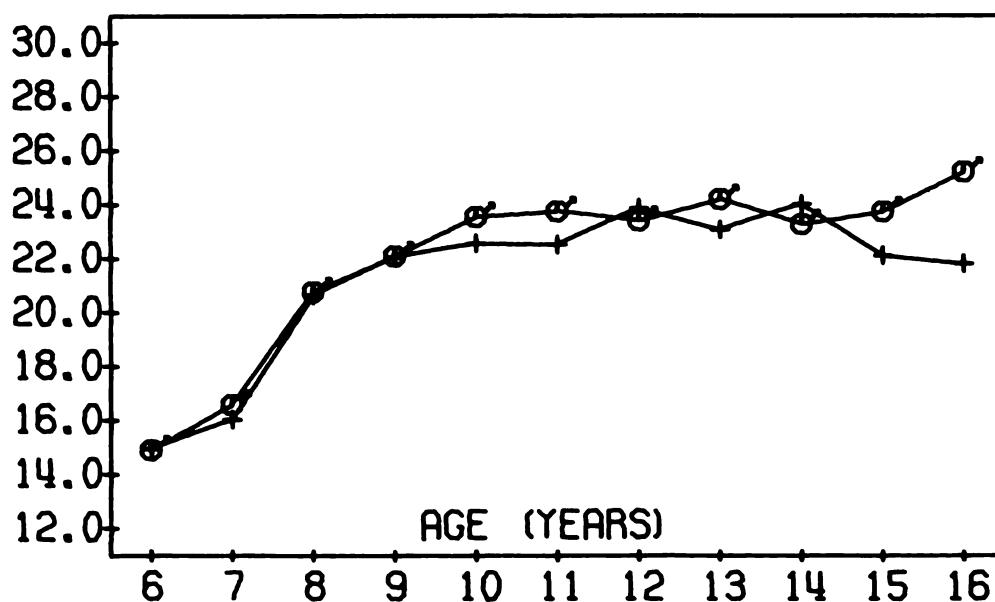
ANGULAR MEASUREMENT  
Variable 72



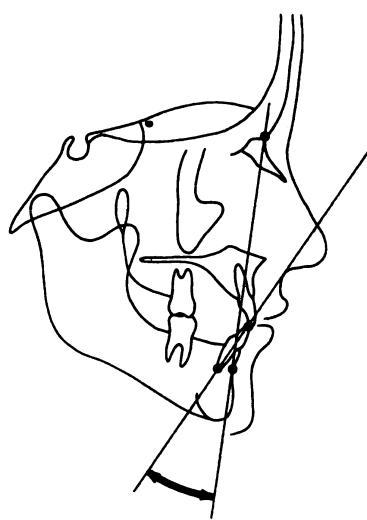
Lower Incisor/A Point-Pogonion  
Ricketts Analysis

PG-A/LIA-LIE 3-9/15-6

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	14.9	6.3	6	25	15.0	7.2
7	43	16.6	6.1	7	31	16.1	7.8
8	44	20.8	5.2	8	36	20.7	6.3
9	46	22.1	4.8	9	31	22.1	6.2
10	45	23.6	4.3	10	35	22.6	5.2
11	43	23.8	4.5	11	30	22.5	5.1
12	44	23.4	5.1	12	27	23.9	5.1
13	43	24.2	5.3	13	29	23.1	4.5
14	40	23.3	5.6	14	25	24.0	5.0
15	33	23.8	5.4	15	19	22.1	4.9
16	23	25.2	4.9	16	9	21.8	7.3



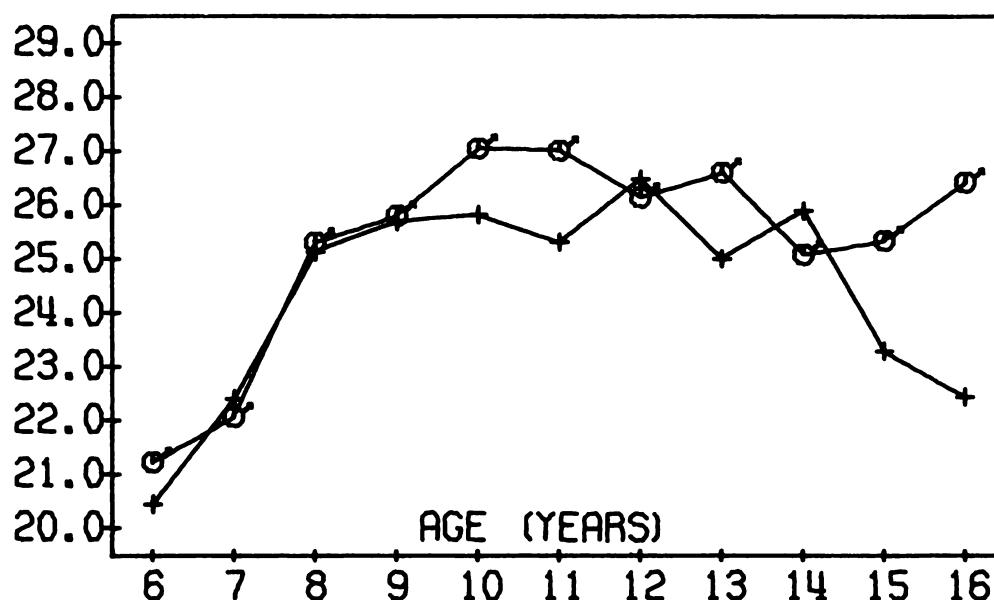
**ANGULAR MEASUREMENT  
Variable 73**



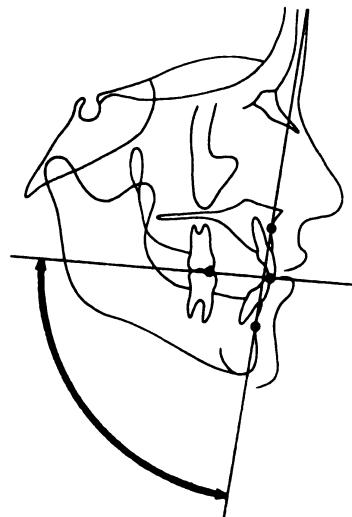
**Lower Incisor/Nasion-B Point  
Steiner Analysis**

**B-N/LIA-LIE 4-38/15-6**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	21.2	8.0	6	25	20.4	7.9
7	43	22.1	7.1	7	31	22.4	7.9
8	44	25.3	6.2	8	36	25.1	6.8
9	47	25.8	5.9	9	31	25.7	7.0
10	46	27.1	5.6	10	35	25.8	6.2
11	43	27.0	6.0	11	30	25.3	6.0
12	44	26.1	6.4	12	27	26.5	6.7
13	43	26.6	7.2	13	29	25.0	6.2
14	40	25.1	7.1	14	25	25.9	7.1
15	33	25.3	6.5	15	19	23.3	6.6
16	23	26.4	7.3	16	9	22.4	9.6



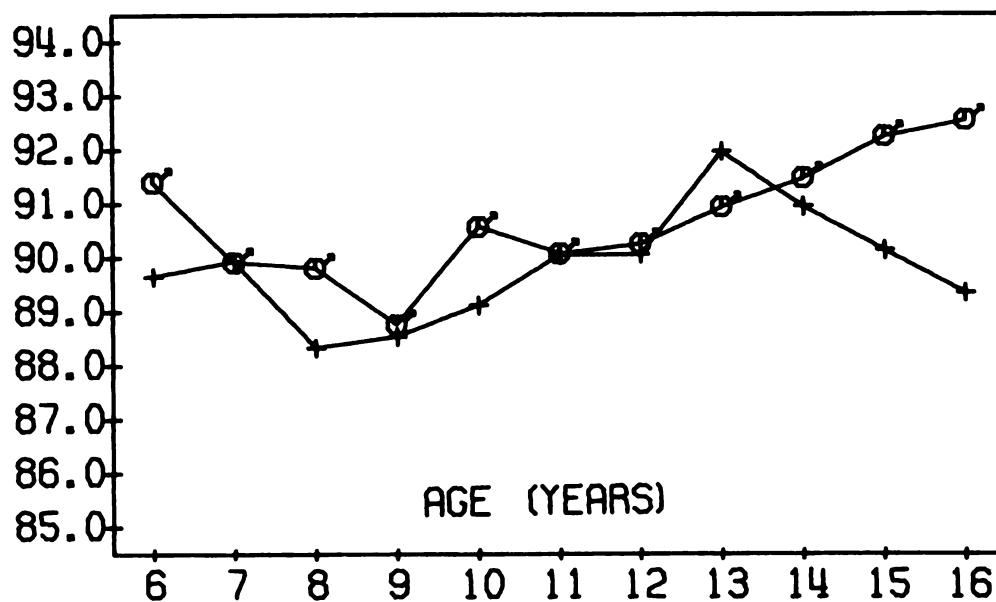
ANGULAR MEASUREMENT  
Variable 73.1



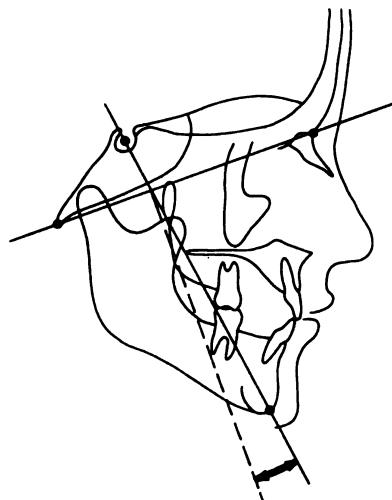
A Point-B Point/Functional  
Occlusal Plane

A-B/PMC-FPP 9-4/46-50

Age	N	Male		Female	
		Mean deg.	S.D. deg.	Mean deg.	S.D. deg.
6	36	91.4	5.0	6	24
7	43	89.9	5.8	7	31
8	44	89.8	5.2	8	36
9	46	88.8	3.1	9	30
10	45	90.6	4.7	10	35
11	43	90.1	3.6	11	30
12	44	90.3	3.8	12	27
13	42	90.9	3.9	13	29
14	39	91.5	4.3	14	25
15	32	92.2	4.2	15	19
16	23	92.5	5.4	16	9



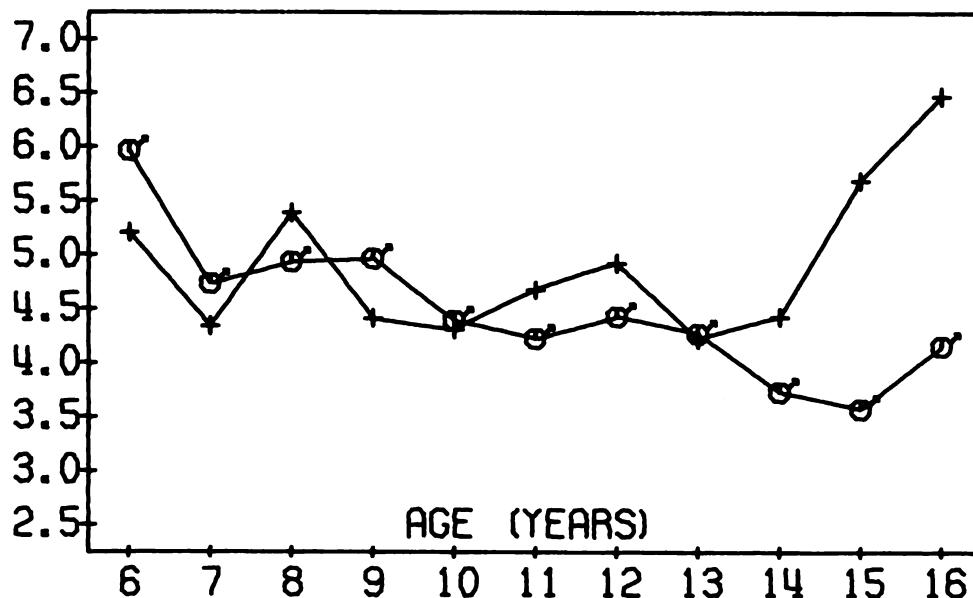
ANGULAR MEASUREMENT  
Variable 74



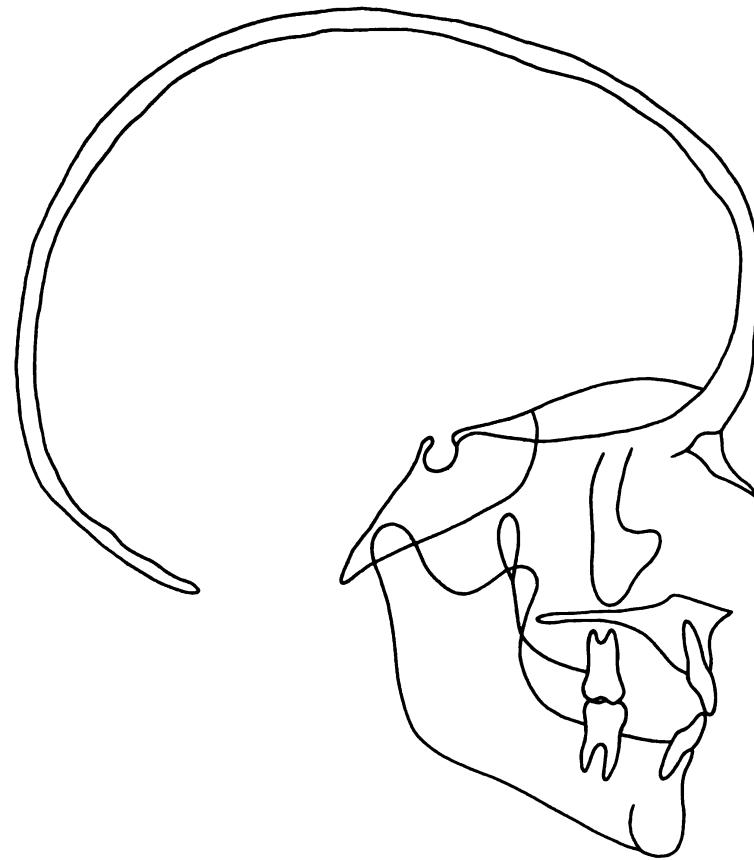
Gnathion-Sella/Basion-Nasion  
Ricketts Analysis

N-BA/GN-S      38-30/2-35  
-90 deg

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	6.0	2.9	6	25	5.2	3.3
7	44	4.7	3.2	7	31	4.3	2.8
8	44	4.9	3.5	8	36	5.4	3.4
9	46	5.0	3.2	9	31	4.4	3.6
10	45	4.4	3.4	10	35	4.3	3.9
11	43	4.2	3.4	11	30	4.7	3.8
12	44	4.4	3.5	12	27	4.9	3.7
13	43	4.3	3.4	13	29	4.2	4.4
14	40	3.7	3.9	14	25	4.4	4.7
15	33	3.6	3.9	15	19	5.7	4.7
16	23	4.2	3.8	16	9	6.5	4.5



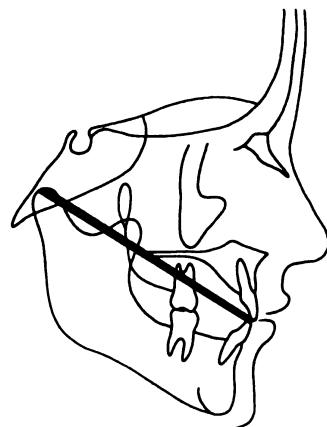




## LINEAR MEASUREMENTS (Variables 75-188)



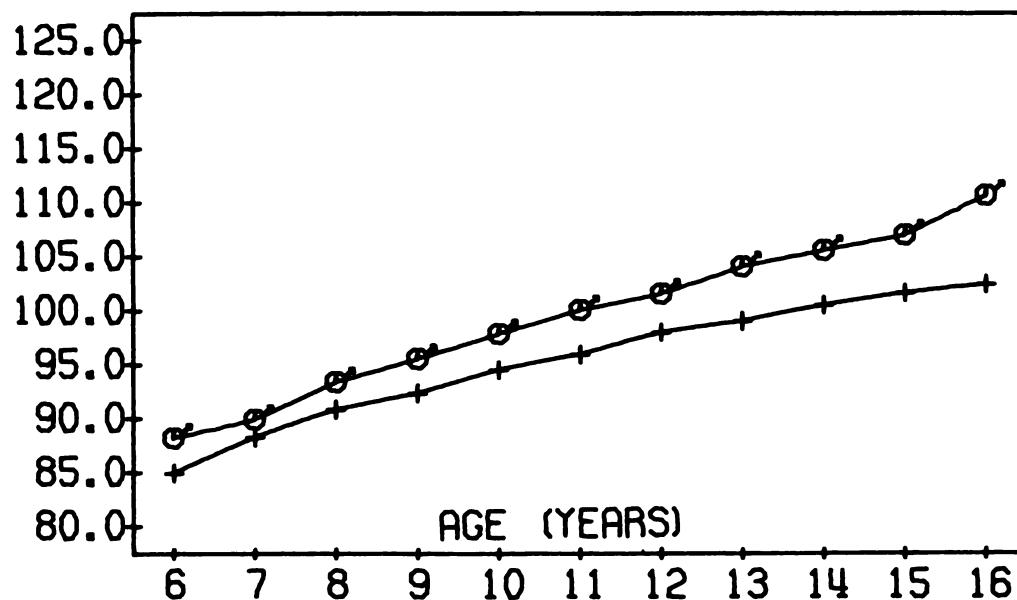
LINEAR MEASUREMENT  
Variable 75



Condylion-Lower Incisor Incisal  
Edge

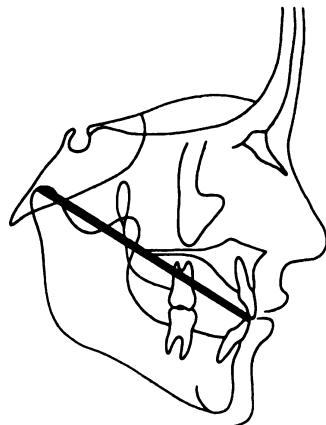
CO-LIE              33-6

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	88.3	4.2	**	6	25	85.0	3.5
7	44	89.9	3.3		7	31	88.3	4.6
8	44	93.5	4.1	**	8	36	90.8	4.7
9	47	95.6	4.1	**	9	31	92.3	5.0
10	46	97.9	4.0	**	10	35	94.5	4.9
11	43	100.1	4.8	**	11	30	95.9	4.3
12	44	101.6	5.1	**	12	27	98.0	4.7
13	43	104.1	5.1	**	13	29	99.0	3.7
14	40	105.6	5.7	**	14	25	100.5	4.3
15	33	107.0	5.0	**	15	19	101.6	5.3
16	23	110.7	5.7	**	16	9	102.4	6.8





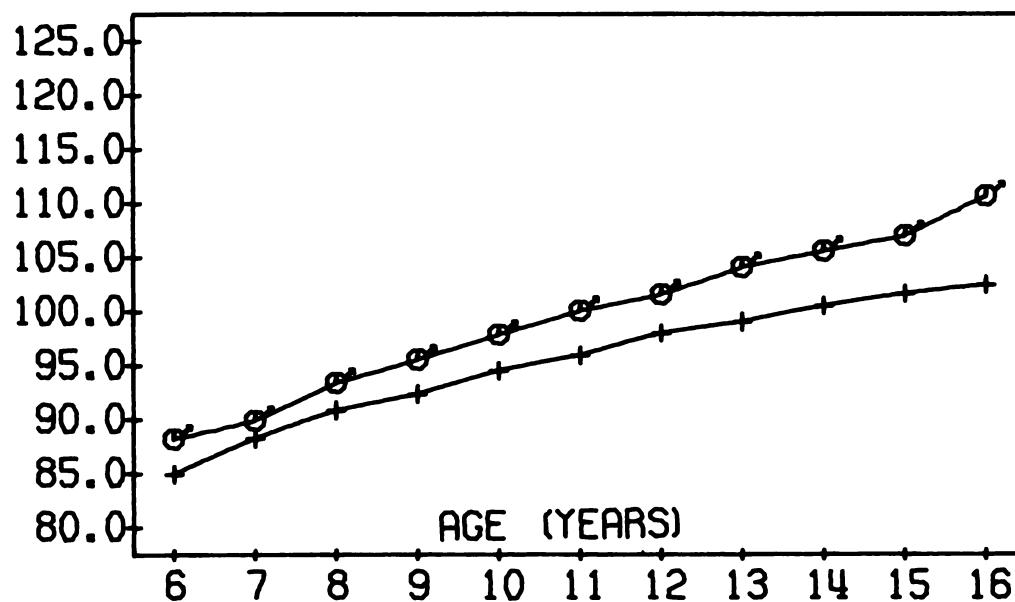
LINEAR MEASUREMENT  
Variable 75



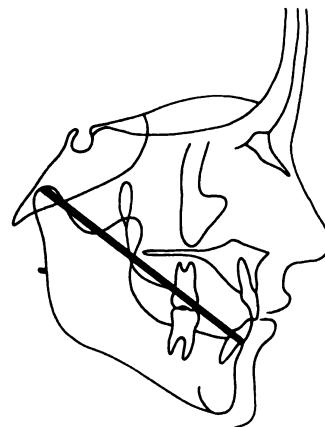
Condylion-Lower Incisor Incisal  
Edge

CO-LIE                    33-6

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	88.3	4.2	**	6	25	85.0	3.5
7	44	89.9	3.3		7	31	88.3	4.6
8	44	93.5	4.1	**	8	36	90.8	4.7
9	47	95.6	4.1	**	9	31	92.3	5.0
10	46	97.9	4.0	**	10	35	94.5	4.9
11	43	100.1	4.8	**	11	30	95.9	4.3
12	44	101.6	5.1	**	12	27	98.0	4.7
13	43	104.1	5.1	**	13	29	99.0	3.7
14	40	105.6	5.7	**	14	25	100.5	4.3
15	33	107.0	5.0	**	15	19	101.6	5.3
16	23	110.7	5.7	**	16	9	102.4	6.8



LINEAR MEASUREMENT  
Variable 76

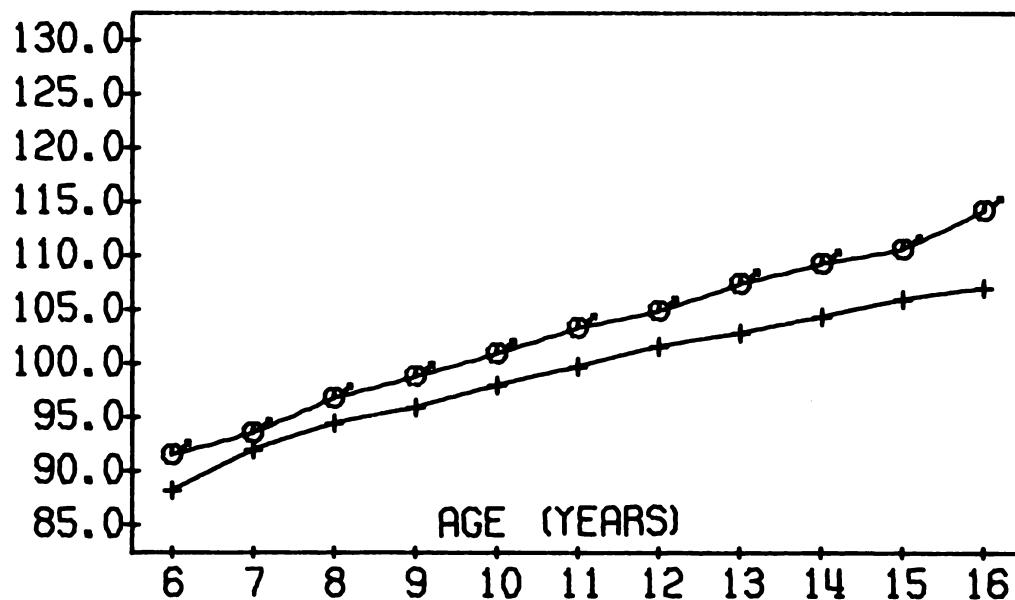


Condylion-Infradentale

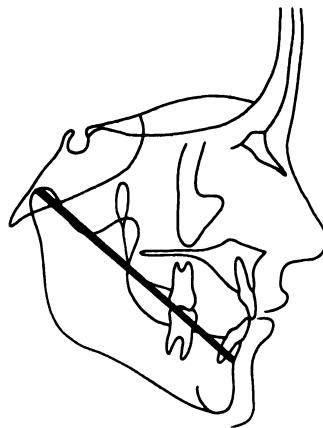
CO-ID

33-5

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	91.6	4.1	**	6	25	88.2	3.6
7	44	93.6	3.1		7	31	92.0	4.2
8	44	96.9	3.6	**	8	36	94.5	4.0
9	47	98.9	3.8	**	9	31	95.9	4.4
10	46	101.0	3.7	**	10	35	98.0	4.4
11	43	103.4	4.4	**	11	30	99.7	3.9
12	44	105.0	4.5	**	12	27	101.6	4.3
13	43	107.5	4.6	**	13	29	102.9	3.7
14	40	109.4	5.2	**	14	25	104.4	3.7
15	33	110.7	4.5	**	15	19	106.0	4.7
16	23	114.3	5.2	**	16	9	107.0	5.0



LINEAR MEASUREMENT  
Variable 77

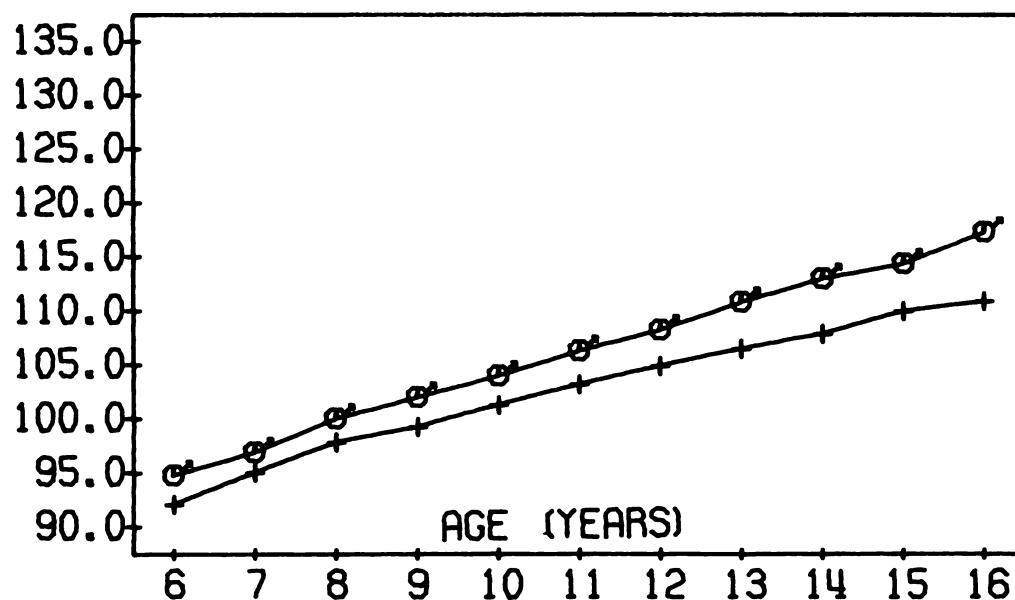


Condylion-B Point

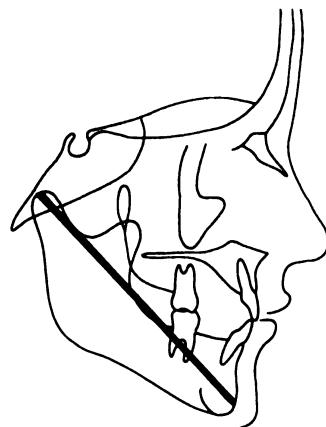
CO-B

33-4

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	94.8	4.2	**	6	25	92.1	3.9
7	44	96.9	3.3	*	7	31	95.1	4.1
8	44	100.1	3.8	**	8	36	97.8	4.1
9	47	102.1	3.9	**	9	31	99.2	4.2
10	46	104.1	3.7	**	10	35	101.3	4.5
11	43	106.4	4.2	**	11	30	103.2	4.3
12	44	108.3	4.3	**	12	27	104.9	4.2
13	43	110.9	4.5	**	13	29	106.5	4.1
14	40	113.1	5.4	**	14	25	107.9	3.7
15	33	114.4	4.3	**	15	19	110.0	4.6
16	23	117.4	5.1	**	16	9	110.9	4.0



LINEAR MEASUREMENT  
Variable 78

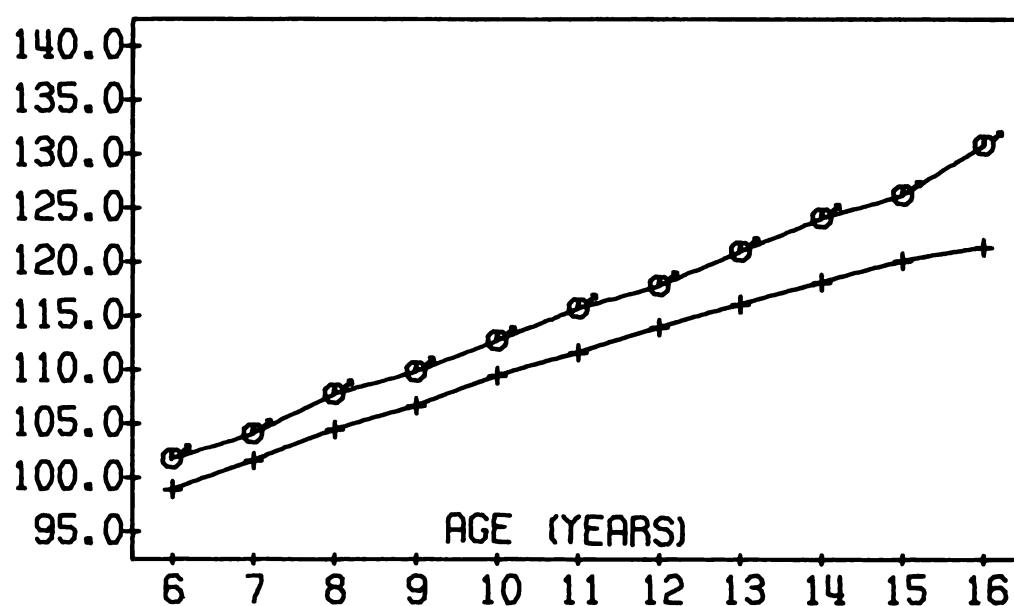


Condylion-Pogonion

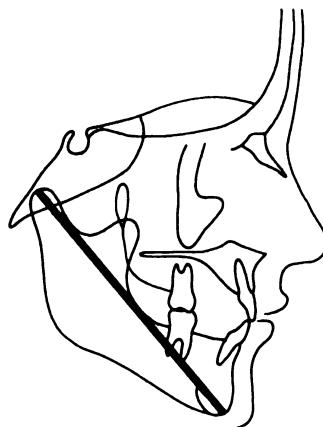
CO-PG

33-3

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	101.8	4.4	**	6	25	98.9	4.3
7	44	104.1	3.5	**	7	31	101.6	4.6
8	44	107.8	3.8	**	8	36	104.5	5.0
9	47	109.9	4.0	**	9	31	106.7	5.2
10	46	112.8	4.0	**	10	35	109.5	4.9
11	43	115.8	4.5	**	11	30	111.6	4.9
12	44	117.9	4.8	**	12	27	114.0	4.6
13	43	121.0	5.5	**	13	29	116.1	3.9
14	40	124.1	5.9	**	14	25	118.1	3.9
15	33	126.3	5.1	**	15	19	120.1	5.1
16	23	130.9	5.7	**	16	9	121.4	3.9



LINEAR MEASUREMENT  
Variable 79

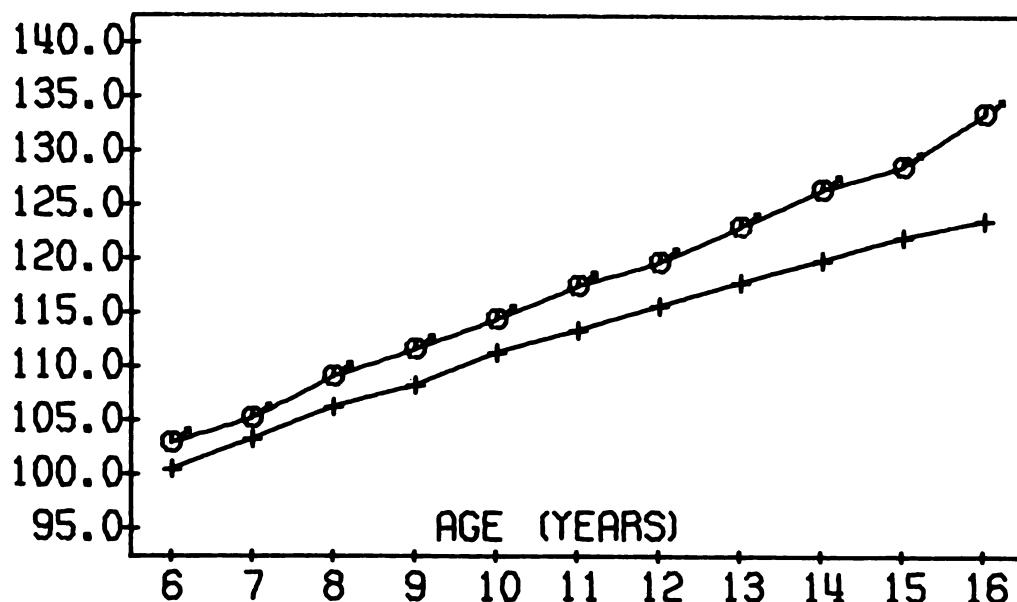


Condylion-Gnathion

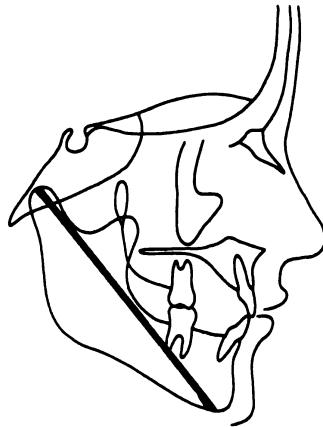
CO-GN

33-2

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	103.0	4.5	*	6	25	100.5
7	44	105.3	3.6	*	7	31	103.3
8	44	109.2	3.8	**	8	36	106.3
9	47	111.7	3.9	**	9	31	108.3
10	46	114.5	3.9	**	10	35	111.3
11	43	117.6	4.3	**	11	30	113.4
12	44	119.7	4.5	**	12	27	115.7
13	43	123.1	5.5	**	13	29	117.8
14	40	126.5	5.7	**	14	25	119.9
15	33	128.7	5.0	**	15	19	122.0
16	23	133.6	5.4	**	16	9	123.6



LINEAR MEASUREMENT  
Variable 80

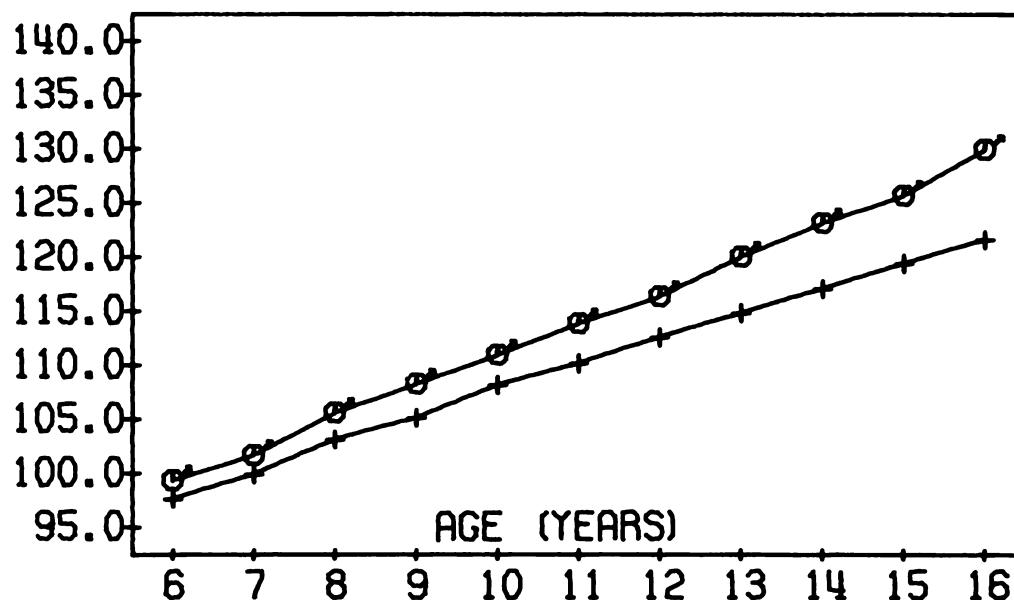


Condylion-Menton

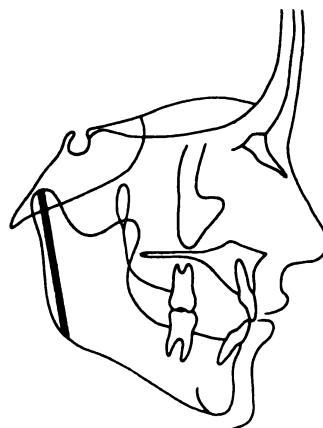
CO-ME

33-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	99.4	4.8	6	25	97.6	3.9
7	44	101.7	3.7	7	31	99.9	4.5
8	44	105.7	4.0	8	36	103.1	4.5
9	47	108.3	4.2	9	31	105.1	4.5
10	46	111.0	4.0	10	35	108.2	4.6
11	43	113.9	4.9	11	30	110.2	4.2
12	44	116.4	5.0	12	27	112.6	4.4
13	42	120.1	5.8	13	29	114.8	4.5
14	39	123.2	6.1	14	25	117.1	4.4
15	32	125.8	5.2	15	19	119.4	4.9
16	23	130.0	5.4	16	9	121.6	3.5



LINEAR MEASUREMENT  
Variable 81

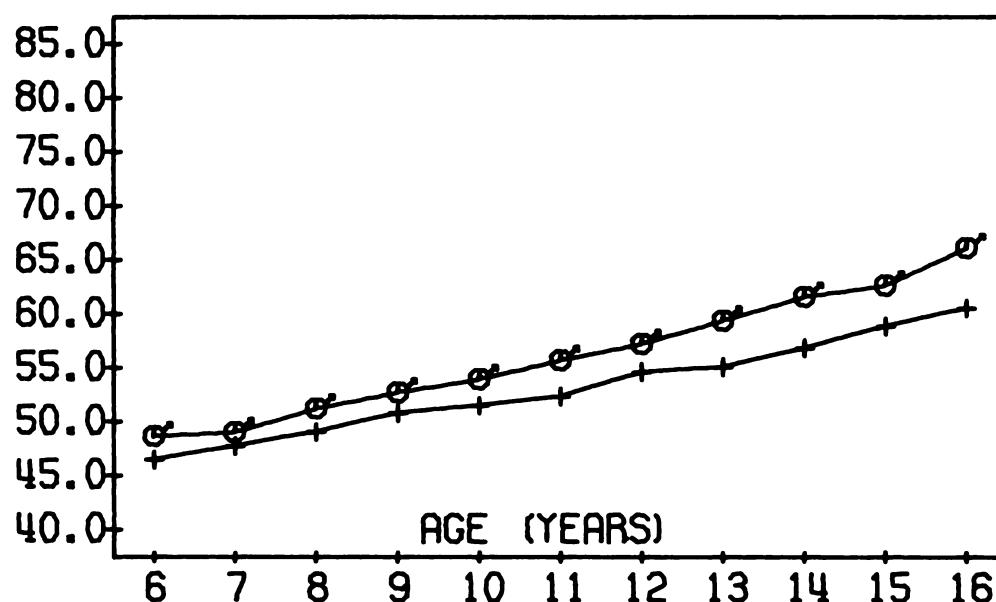


Condylion-Gonion

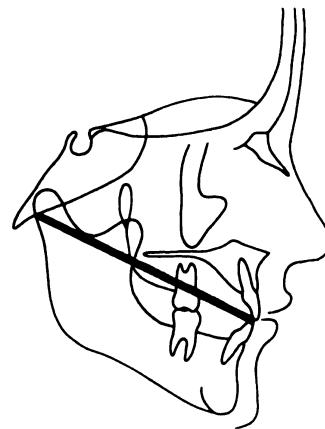
CO-GO

33-27

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	48.7	3.5	**	6	25	46.5	2.9
7	44	49.1	3.4		7	31	47.7	2.8
8	44	51.3	3.1	**	8	36	49.1	2.9
9	47	52.8	3.3	**	9	31	50.8	2.9
10	46	54.0	3.5	**	10	35	51.5	2.7
11	43	55.8	3.5	**	11	30	52.4	2.8
12	44	57.2	3.9	**	12	27	54.6	3.9
13	43	59.4	4.2	**	13	29	55.1	3.8
14	40	61.6	4.4	**	14	25	56.8	3.5
15	33	62.7	4.1	**	15	19	58.9	3.4
16	23	66.1	4.1	**	16	9	60.5	2.4



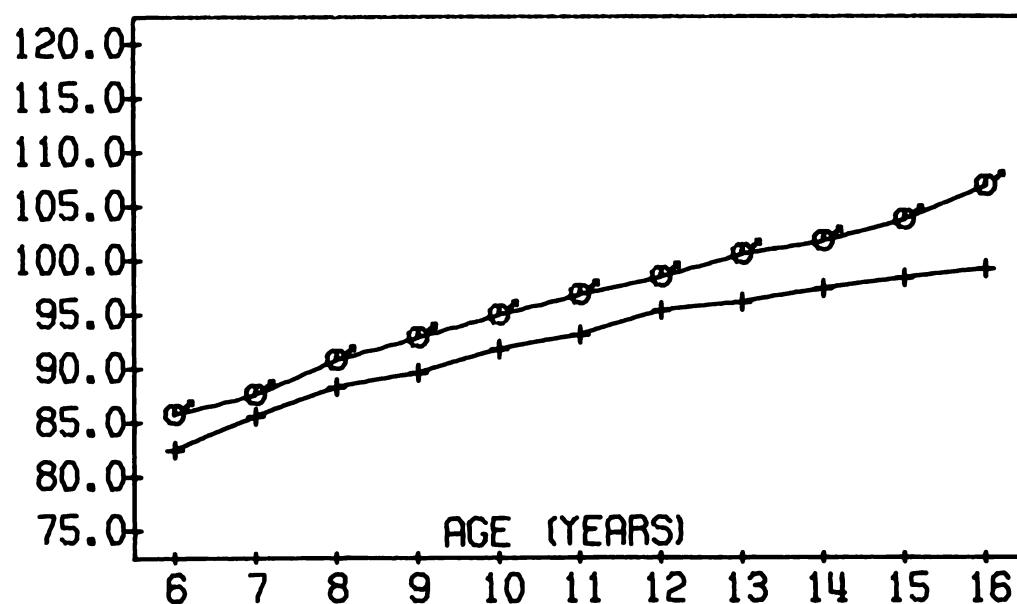
LINEAR MEASUREMENT  
Variable 82



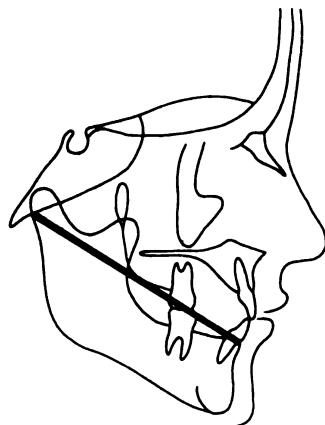
Articulare-Lower Incisor  
Incisal Edge

AR-LIE            31-6

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	85.8	3.8	**	6	25	82.5	4.3
7	44	87.7	3.3	*	7	31	85.6	5.0
8	44	90.9	3.9	**	8	36	88.3	5.0
9	47	92.9	3.9	**	9	31	89.6	5.0
10	46	95.0	3.6	**	10	35	91.7	5.2
11	43	96.9	4.5	**	11	30	93.1	4.4
12	44	98.5	4.8	**	12	27	95.3	4.8
13	43	100.6	4.9	**	13	29	96.1	4.3
14	40	101.8	5.5	**	14	25	97.4	5.2
15	33	103.8	4.6	**	15	19	98.3	5.8
16	23	106.9	5.5	**	16	9	99.2	7.6



LINEAR MEASUREMENT  
Variable 83

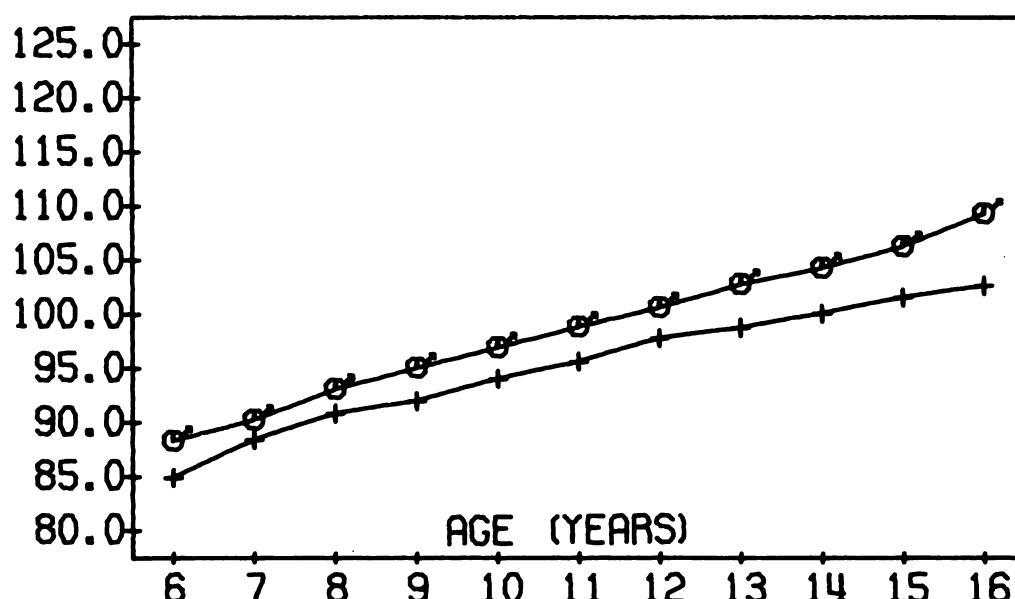


Articulare-Infradentale

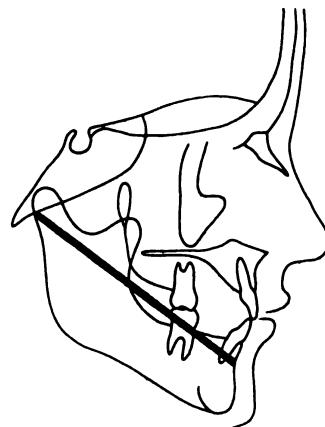
AR-ID

31-5

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	88.4	3.5	**	6	25	84.9	4.4
7	44	90.3	3.1	*	7	31	88.4	4.6
8	44	93.2	3.4	**	8	36	90.8	4.4
9	47	95.1	3.5	**	9	31	92.0	4.6
10	46	97.0	3.3	**	10	35	94.0	4.8
11	43	98.9	4.0	**	11	30	95.6	4.2
12	44	100.7	4.2	**	12	27	97.8	4.5
13	43	102.8	4.4	**	13	29	98.7	4.4
14	40	104.3	4.9	**	14	25	100.1	4.8
15	33	106.3	4.1	**	15	19	101.6	5.4
16	23	109.4	5.0	**	16	9	102.7	6.2



LINEAR MEASUREMENT  
Variable 84

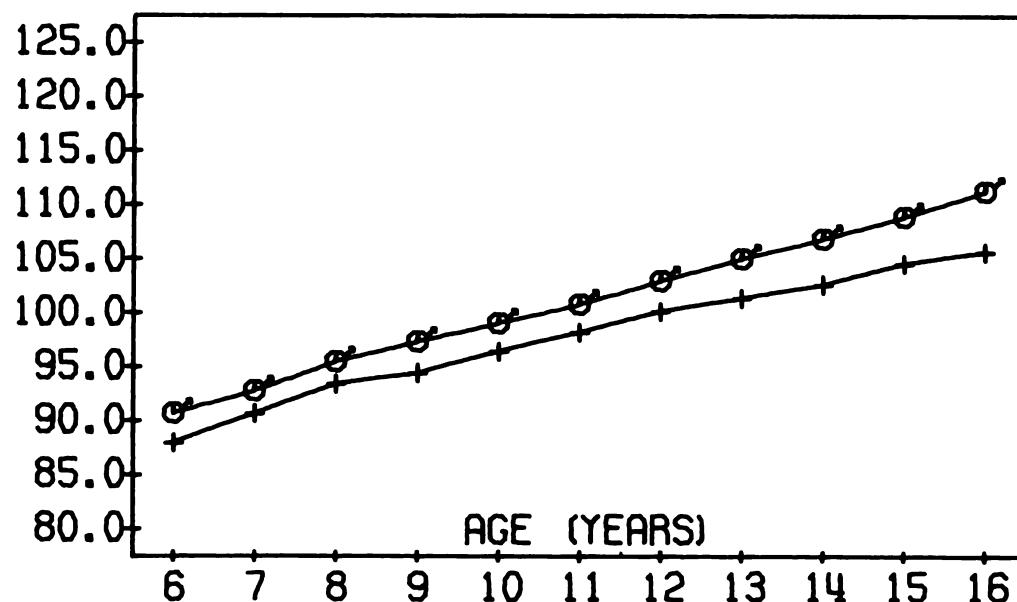


Articulare-B Point

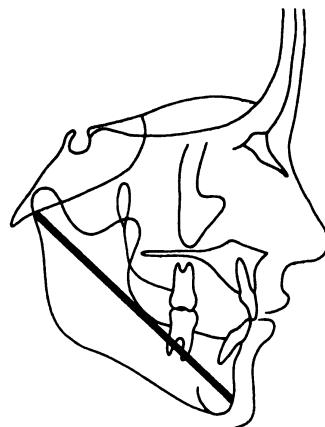
AR-B

31-4

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	90.8	3.5	6	25	88.0	4.8
7	44	92.8	3.2	7	31	90.7	4.6
8	44	95.5	3.4	8	36	93.4	4.5
9	47	97.4	3.4	9	31	94.4	4.3
10	46	99.1	3.2	10	35	96.4	4.8
11	43	100.8	3.8	11	30	98.2	4.6
12	44	103.0	4.0	12	27	100.1	4.4
13	43	105.0	4.2	13	29	101.3	4.8
14	40	106.9	4.9	14	25	102.6	4.8
15	33	108.9	3.9	15	19	104.6	5.6
16	23	111.3	4.7	16	9	105.6	5.2



LINEAR MEASUREMENT  
Variable 85

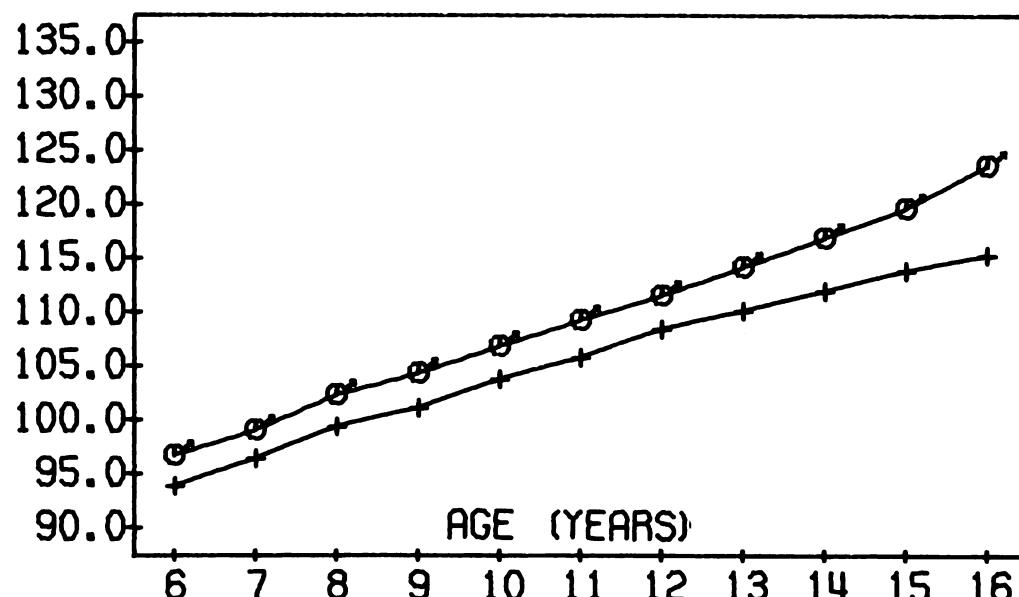


Articulare-Pogonion

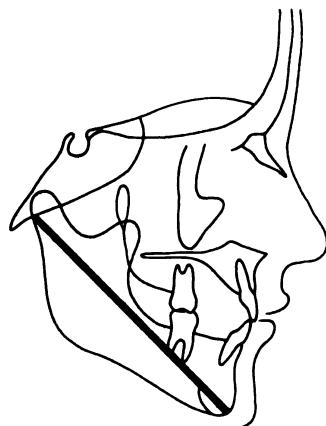
AR-PG

31-3

Age	N	Male			Age	N	Female		
		Mean mm	S.D. mm	**			Mean mm	S.D. mm	
6	37	96.8	3.7	**	6	25	93.9	5.1	
7	44	99.1	3.2	**	7	31	96.4	4.9	
8	44	102.4	3.3	**	8	36	99.4	5.5	
9	47	104.4	3.5	**	9	31	101.1	5.2	
10	46	106.9	3.4	**	10	35	103.8	5.2	
11	43	109.3	4.0	**	11	30	105.8	5.2	
12	44	111.6	4.2	**	12	27	108.4	5.0	
13	43	114.2	5.2	**	13	29	110.1	4.8	
14	40	116.9	5.4	**	14	25	112.0	5.0	
15	33	119.7	4.3	**	15	19	113.8	5.9	
16	23	123.7	5.0	**	16	9	115.2	4.9	



LINEAR MEASUREMENT  
Variable 86

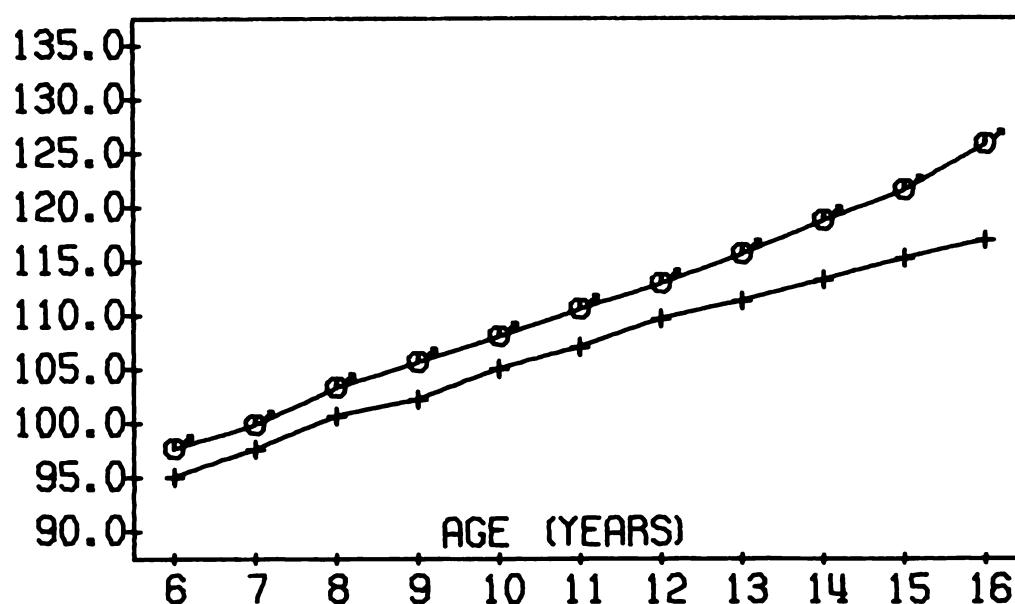


Articulare-Gnathion

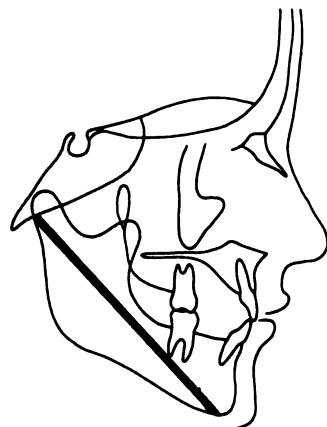
AR-GN

31-2

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	97.7	3.9	*	6	25	95.1
7	44	100.0	3.4	**	7	31	97.6
8	44	103.4	3.4	**	8	36	100.7
9	47	105.8	3.4	**	9	31	102.3
10	46	108.1	3.5	**	10	35	105.1
11	43	110.7	3.8	**	11	30	107.1
12	44	113.0	4.0	**	12	27	109.7
13	43	115.8	5.1	**	13	29	111.4
14	40	118.8	5.2	**	14	25	113.3
15	33	121.6	4.4	**	15	19	115.2
16	23	125.9	4.8	**	16	9	117.0



LINEAR MEASUREMENT  
Variable 87

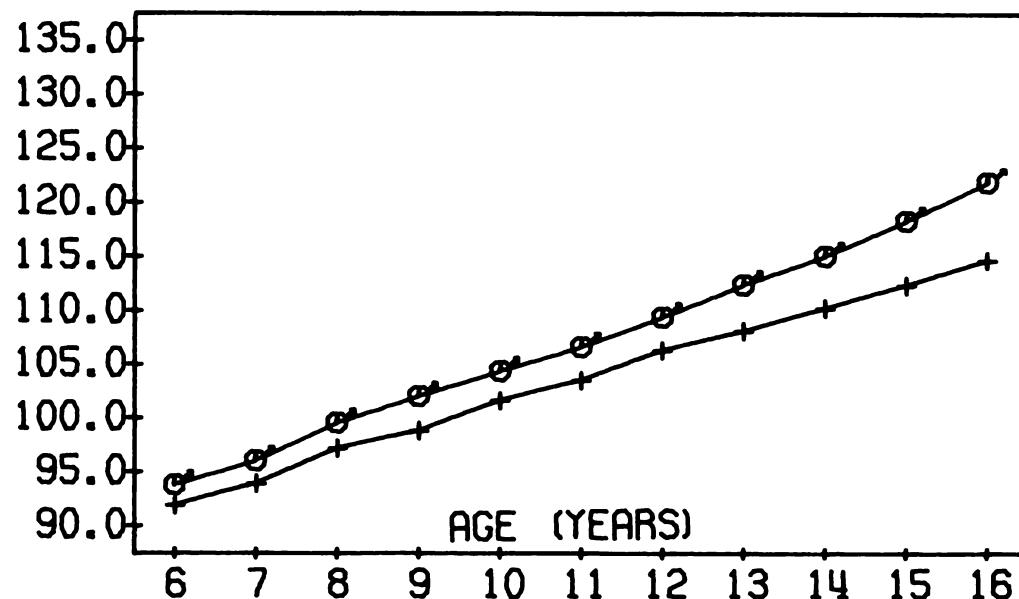


Articulare-Menton

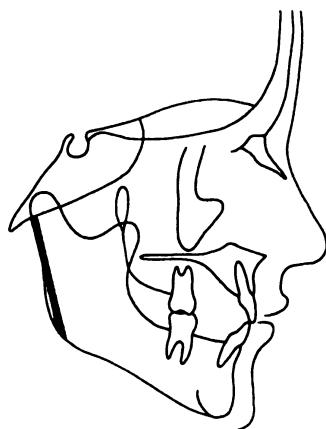
AR-ME

31-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	93.8	4.2	6	25	91.9	4.9
7	44	96.1	3.6	*	7	31	94.0
8	44	99.6	3.6	**	8	36	97.2
9	47	102.1	3.9	**	9	31	98.8
10	46	104.4	3.7	**	10	35	101.6
11	43	106.7	4.4	**	11	30	103.5
12	44	109.4	4.5	**	12	27	106.3
13	42	112.4	5.4	**	13	29	108.1
14	39	115.1	5.7	**	14	25	110.2
15	32	118.4	4.5	**	15	19	112.3
16	23	121.9	4.7	**	16	9	114.7

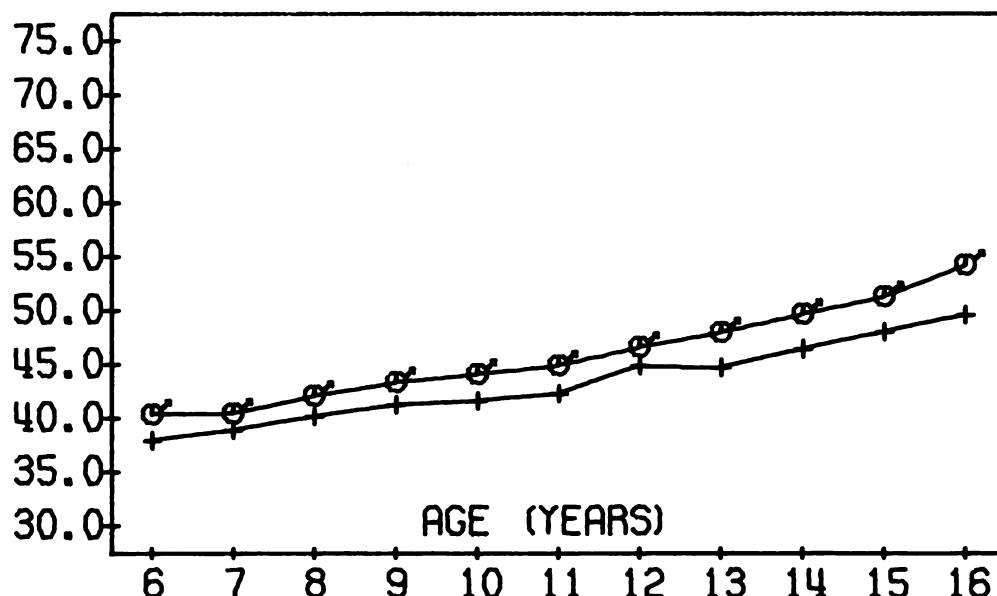


LINEAR MEASUREMENT  
Variable 88

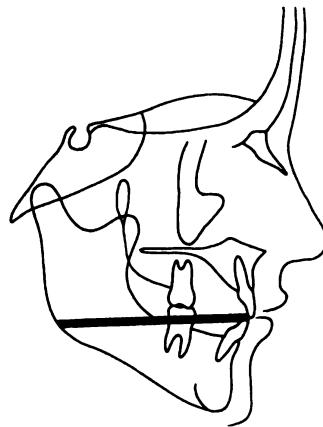


Articulare-Gonion  
AR-GO      31-27

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	40.4	3.3	**	6	25	37.9	3.7
7	44	40.5	3.3	*	7	31	38.9	3.4
8	44	42.2	3.4	**	8	36	40.2	3.2
9	47	43.4	3.3	**	9	31	41.2	3.5
10	46	44.2	3.4	**	10	35	41.6	3.2
11	43	45.0	3.9	**	11	30	42.3	3.1
12	44	46.7	3.8		12	27	44.9	3.9
13	43	48.0	4.6	**	13	29	44.7	3.8
14	40	49.8	4.6	**	14	25	46.4	4.6
15	33	51.4	4.6	**	15	19	48.1	4.1
16	23	54.3	4.1	**	16	9	49.6	3.9



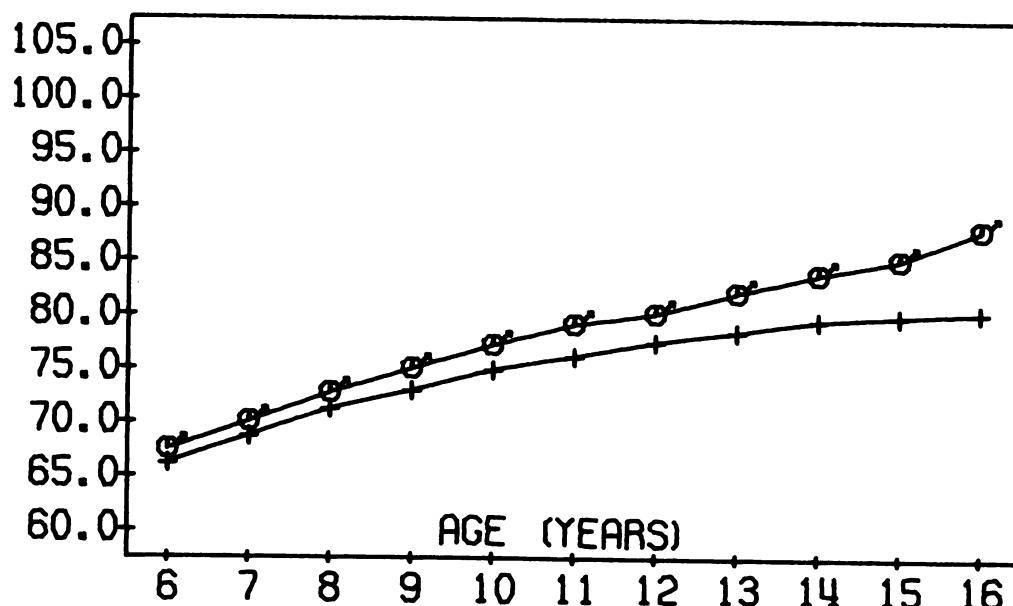
LINEAR MEASUREMENT  
Variable 89



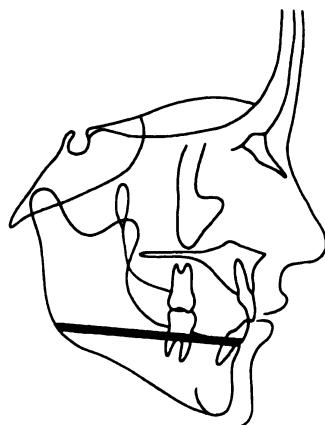
Gonion-Lower Incisor Incisal  
Edge

GO-LIE      27-6

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	67.5	3.2	6	25	66.2	4.0
7	44	70.1	3.6	7	31	68.7	4.1
8	44	72.9	3.5	8	36	71.3	4.3
9	47	75.2	3.5	*	9	73.0	4.5
10	46	77.3	3.3	**	10	74.9	4.5
11	43	79.3	3.8	**	11	76.2	4.0
12	44	80.3	4.0	**	12	77.5	4.2
13	43	82.2	4.4	**	13	78.5	3.6
14	40	83.9	5.1	**	14	79.6	4.0
15	33	85.3	5.0	**	15	80.0	4.4
16	23	88.1	4.9	**	16	80.4	5.9



LINEAR MEASUREMENT  
Variable 90

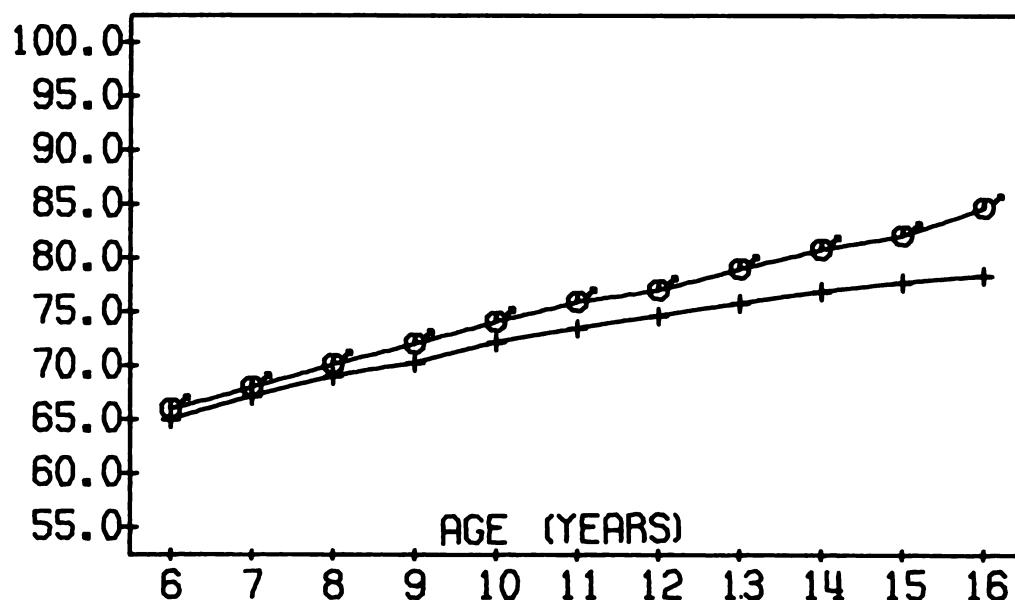


Gonion-Infradentale

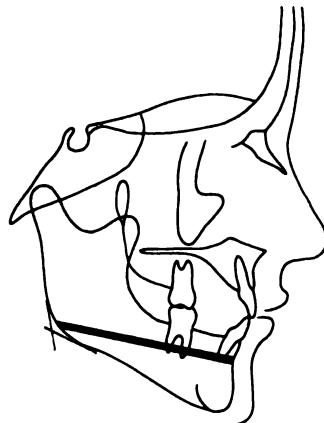
GO-ID

27-5

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	66.1	2.7	6	25	65.0	3.8
7	44	68.1	3.1	7	31	67.2	3.5
8	44	70.2	2.8	8	36	69.0	3.7
9	47	72.1	3.0	*	9	31	70.3
10	46	74.2	2.9	**	10	35	72.2
11	43	76.0	3.3	**	11	30	73.5
12	44	77.1	3.4	**	12	27	74.7
13	43	79.0	3.8	**	13	29	75.8
14	40	80.8	4.3	**	14	25	76.9
15	33	82.1	4.4	**	15	19	77.7
16	23	84.7	4.2	**	16	9	78.4



LINEAR MEASUREMENT  
Variable 91

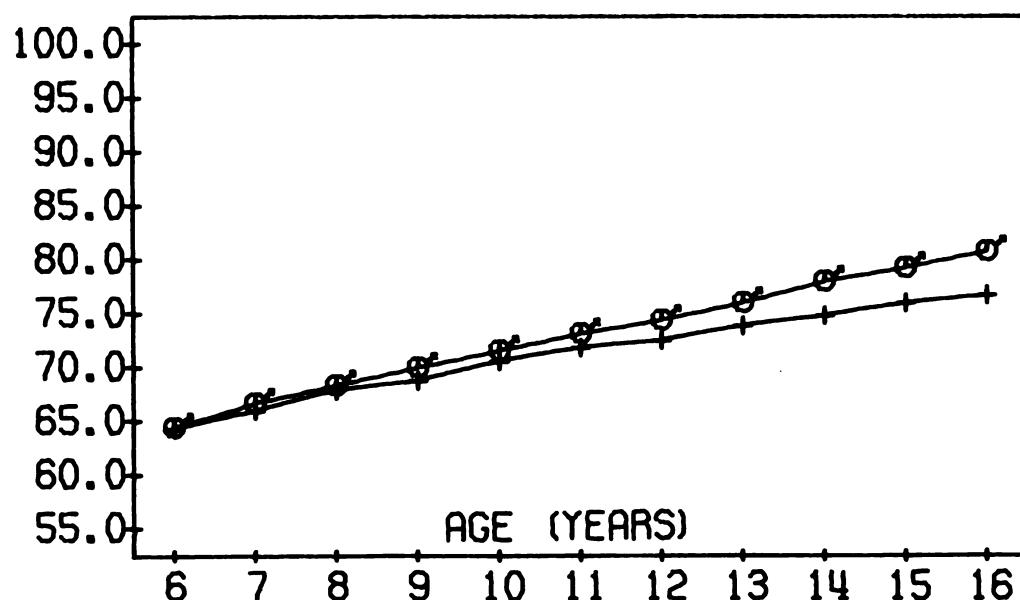


Gonion-B Point

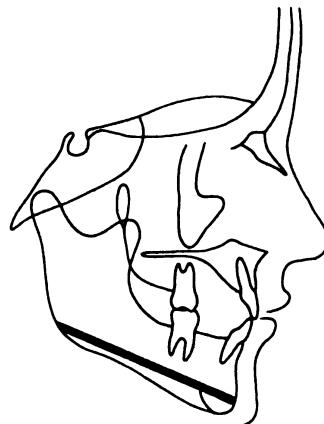
GO-B

27-4

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	64.5	2.7	6	25	64.3	3.9	
7	44	66.7	3.1	7	31	66.0	3.4	
8	44	68.4	2.8	8	36	67.9	3.8	
9	47	70.0	2.7	9	31	68.8	3.7	
10	46	71.6	2.7	10	35	70.5	3.9	
11	43	73.2	3.0	11	30	71.8	3.7	
12	44	74.4	3.3	12	27	72.5	3.2	
13	43	76.1	3.3	13	29	73.8	3.8	
14	40	78.0	3.9	14	25	74.7	3.4	
15	33	79.2	3.9	15	19	75.9	3.6	
16	23	80.8	4.0	**	16	9	76.7	4.0



LINEAR MEASUREMENT  
Variable 92

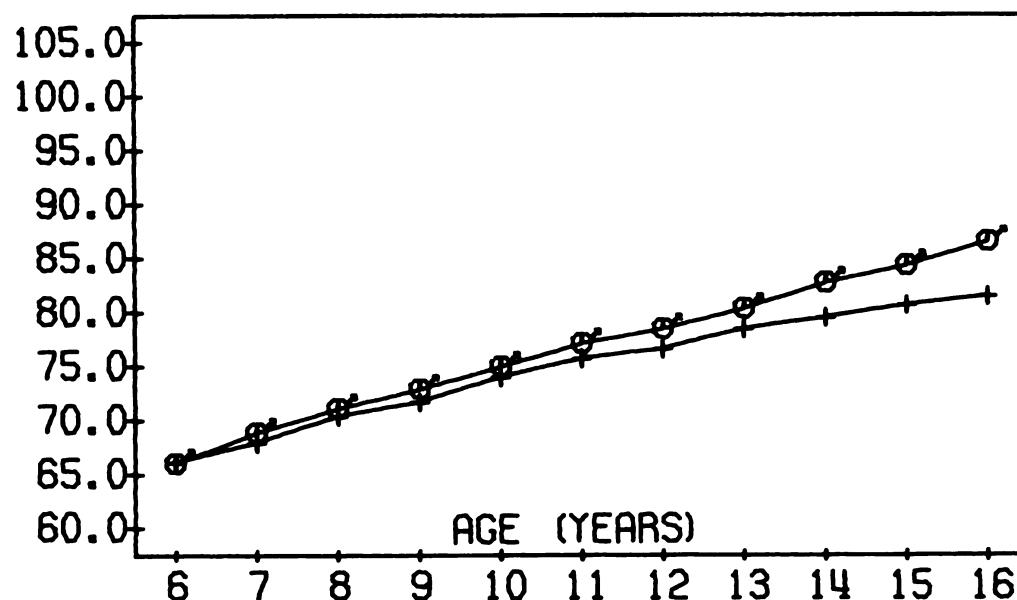


Gonion-Pogonion

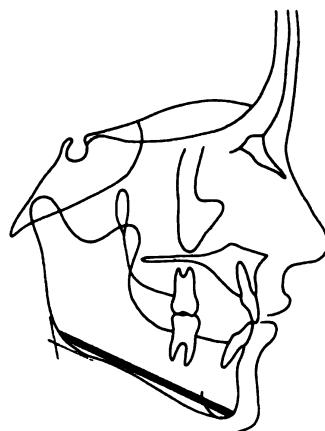
GO-PG

27-3

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	66.1	2.8	6	25	66.1	4.2	
7	44	68.9	3.0	7	31	67.9	3.9	
8	44	71.2	2.9	8	36	70.4	4.2	
9	47	73.0	2.7	9	31	71.7	4.5	
10	46	75.1	2.8	10	35	74.0	4.2	
11	43	77.1	3.2	11	30	75.7	4.2	
12	44	78.5	3.4	*	12	27	76.6	3.8
13	43	80.4	3.7	*	13	29	78.4	4.0
14	40	82.8	4.0	**	14	25	79.4	3.7
15	33	84.3	4.1	**	15	19	80.6	3.9
16	23	86.5	3.7	**	16	9	81.5	3.8



LINEAR MEASUREMENT  
Variable 93

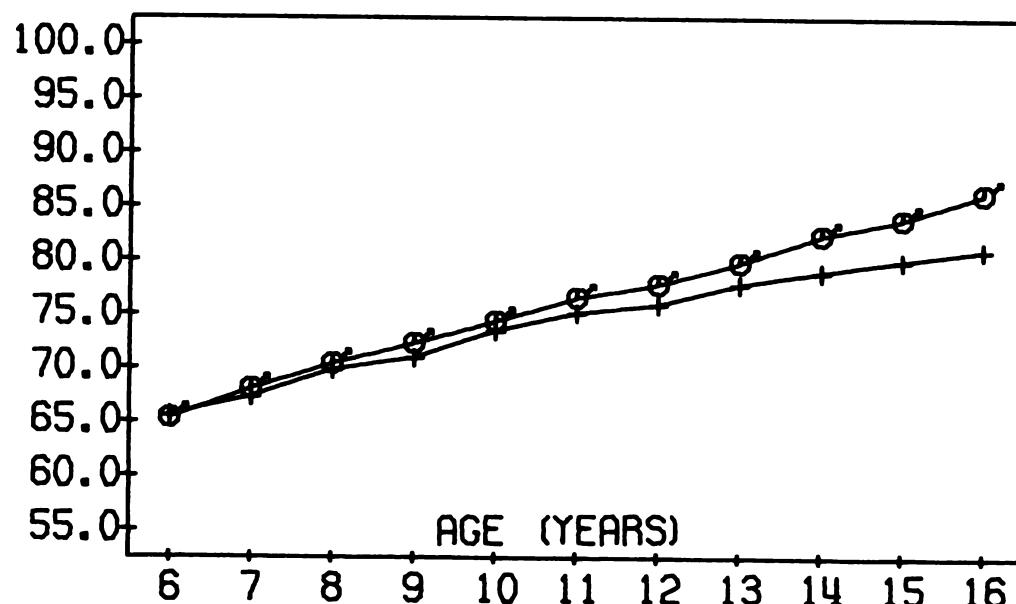


Gonion-Gnathion

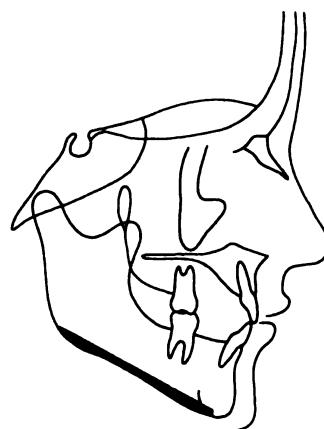
GO-GN

27-2

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	65.4	2.8	6	25	65.6	4.2	
7	44	68.2	3.0	7	31	67.3	4.0	
8	44	70.5	2.8	8	36	69.8	4.2	
9	47	72.4	2.7	9	31	70.9	4.6	
10	46	74.4	2.8	10	35	73.4	4.4	
11	43	76.6	3.0	11	30	75.1	4.2	
12	44	77.9	3.2	*	12	27	75.9	4.1
13	43	79.9	3.8	*	13	29	77.8	4.2
14	40	82.4	3.8	**	14	25	78.9	4.0
15	33	84.0	3.9	**	15	19	80.0	4.1
16	23	86.3	3.6	**	16	9	81.0	4.0



LINEAR MEASUREMENT  
Variable 94

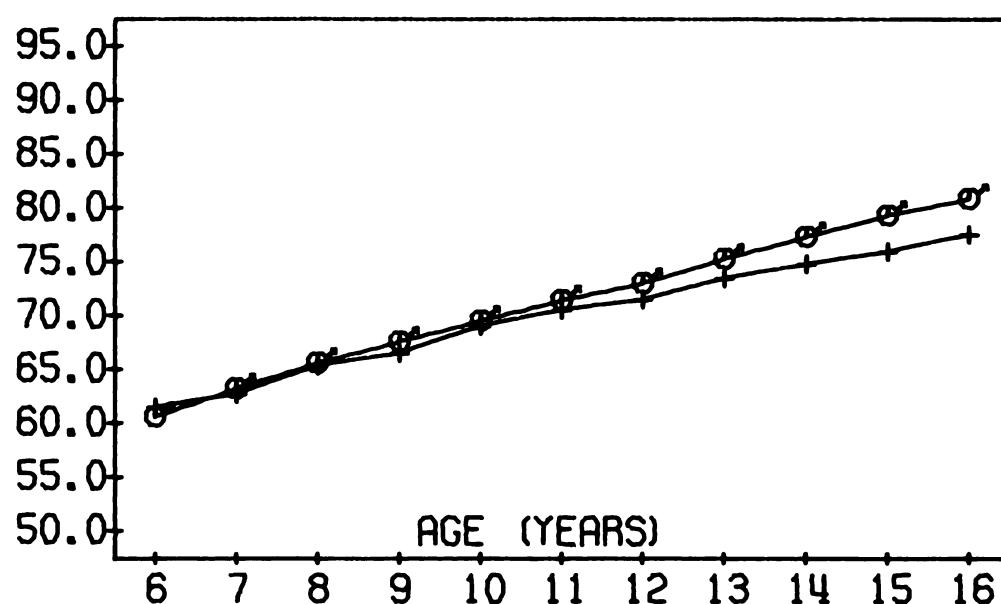


Gonion-Menton

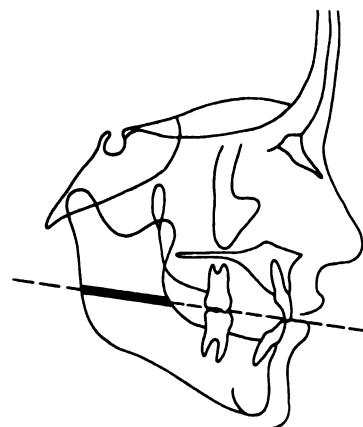
GO-ME

27-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	60.7	3.2	6	25	61.5	4.0
7	44	63.3	3.0	7	31	62.7	4.0
8	44	65.7	3.1	8	36	65.4	4.3
9	47	67.7	3.1	9	31	66.5	4.4
10	46	69.6	3.0	10	35	69.0	4.2
11	43	71.5	3.3	11	30	70.6	3.9
12	44	73.1	3.5	12	27	71.5	4.0
13	42	75.3	3.8	13	29	73.4	4.4
14	39	77.4	3.9	14	25	74.8	4.4
15	32	79.4	4.0	15	19	75.9	4.4
16	23	80.9	3.6	*	9	77.6	3.4



LINEAR MEASUREMENT  
Variable 95

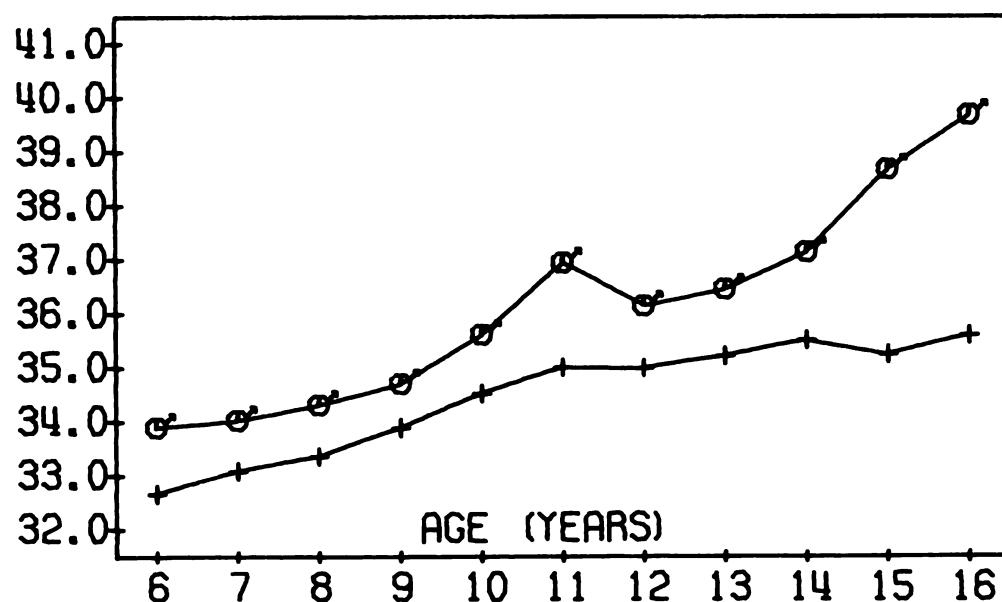


Anterior Ramus Border-  
Posterior Ramus Border

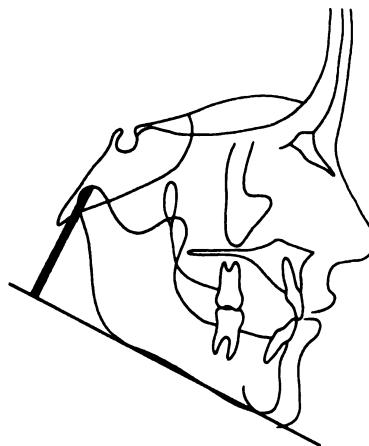
AB-PB

52-51

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	33.9	1.9	*	6	25	32.7	2.5
7	44	34.0	2.0		7	31	33.1	3.0
8	44	34.3	2.5		8	36	33.4	2.5
9	47	34.7	2.5		9	31	33.9	2.6
10	46	35.6	2.3	*	10	35	34.5	2.4
11	43	37.0	2.7	**	11	30	35.0	2.7
12	44	36.2	2.4	*	12	27	35.0	2.0
13	43	36.5	2.5	*	13	29	35.2	2.4
14	40	37.1	3.2	*	14	25	35.5	2.1
15	33	38.7	3.4	**	15	19	35.2	2.2
16	23	39.7	2.9	**	16	9	35.6	2.9



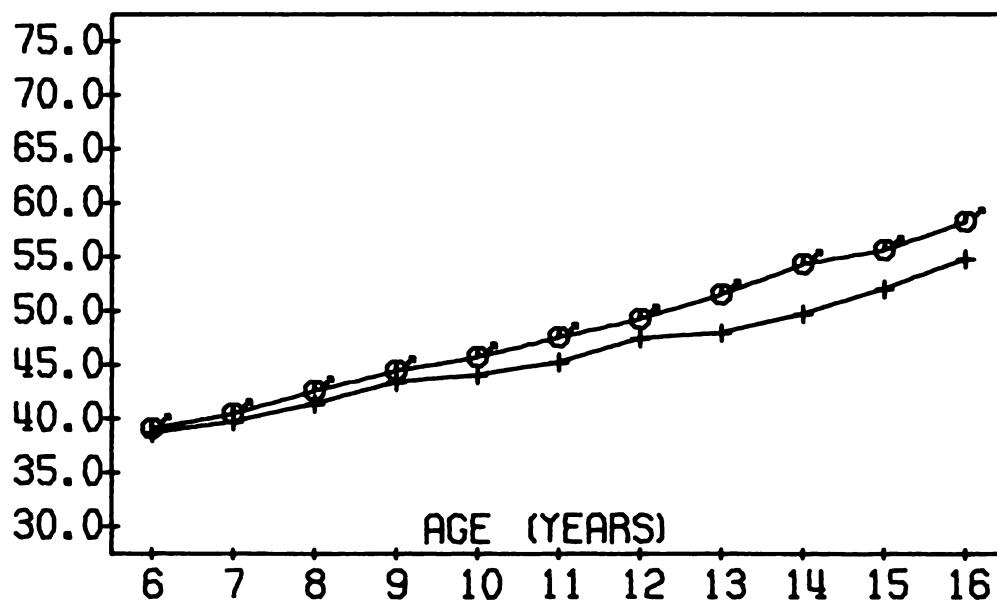
LINEAR MEASUREMENT  
Variable 96



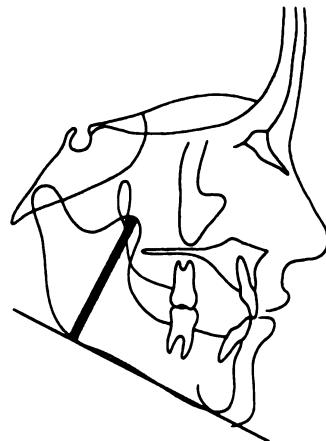
Condylion perpendicular to  
Mandibular Plane

CO<sub>1</sub>G01-ME      33128-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	39.1	3.7	6	25	38.7	4.2
7	44	40.5	4.2	7	31	39.7	3.7
8	44	42.6	3.7	8	36	41.4	3.8
9	47	44.5	4.2	9	31	43.4	3.8
10	46	45.8	4.4	10	35	44.0	3.9
11	43	47.6	4.2	11	30	45.2	4.3
12	44	49.3	4.8	12	27	47.4	4.3
13	42	51.6	5.2	13	29	48.0	5.9
14	39	54.4	5.5	14	25	49.7	4.8
15	32	55.7	4.8	15	19	52.0	4.0
16	23	58.3	5.2	*	9	54.8	2.7



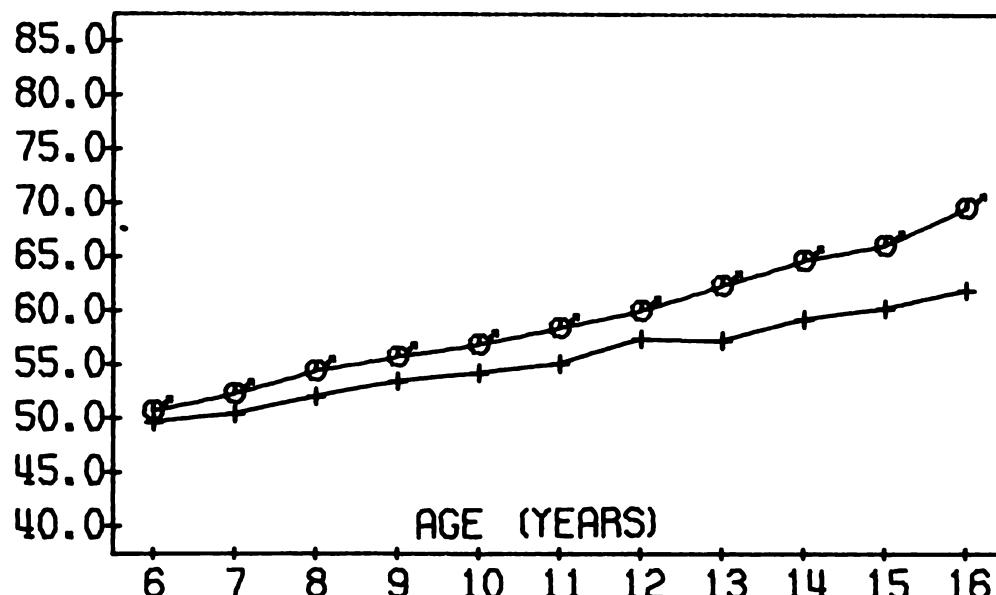
LINEAR MEASUREMENT  
Variable 97



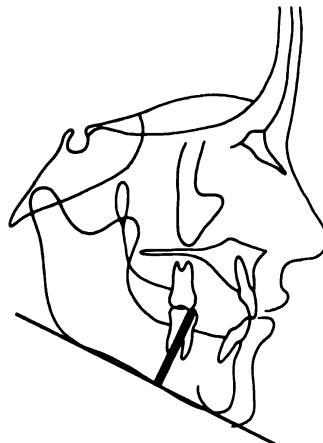
Coronoid Process perpendicular  
to Mandibular Plane

CP $\perp$ G01-ME      44 $\perp$ 28-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	50.7	3.2	6	25	49.6	3.3
7	44	52.4	3.4	7	31	50.4	3.2
8	44	54.5	3.2	8	36	52.0	3.2
9	47	55.8	3.4	9	31	53.4	3.1
10	46	56.9	3.7	10	35	54.2	3.5
11	43	58.5	3.4	11	30	55.1	3.0
12	44	60.1	3.9	12	27	57.4	3.6
13	42	62.4	4.2	13	29	57.2	3.7
14	39	64.8	4.5	14	25	59.2	3.8
15	32	66.2	4.5	15	19	60.3	3.4
16	23	69.7	4.8	16	9	62.0	3.3



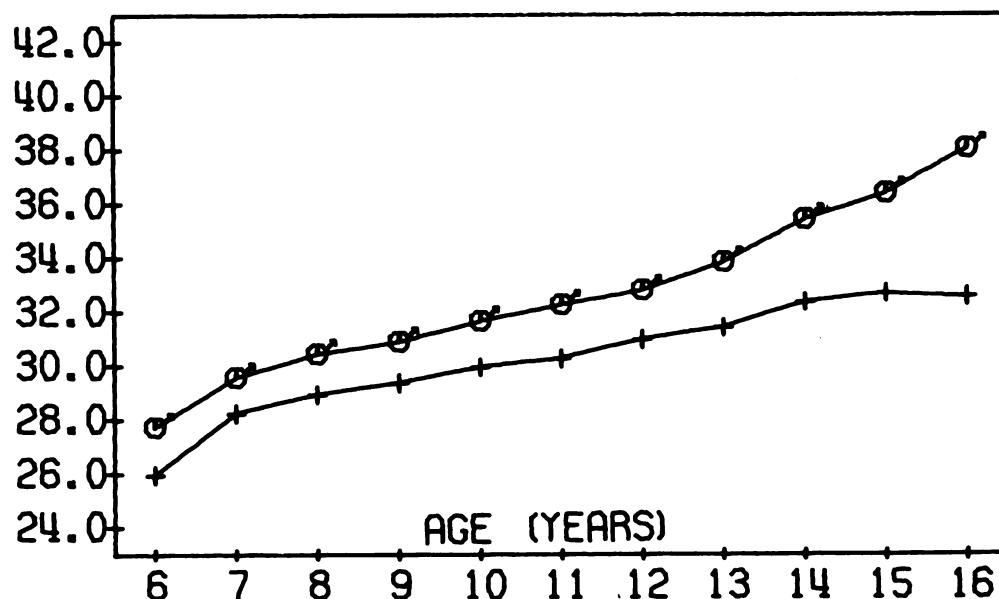
LINEAR MEASUREMENT  
Variable 98



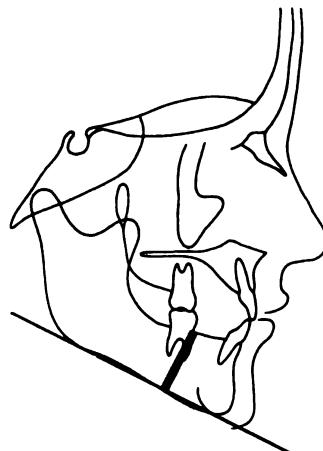
Lower Molar Mesial Cusp Tip  
perpendicular to Mandibular  
Plane

LMT<sub>1</sub>G01-ME      18<sub>1</sub>28-1

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	27.7	4.0		6	25	26.0	3.9
7	44	29.6	2.2	**	7	31	28.2	2.7
8	44	30.5	2.1	**	8	36	28.9	1.5
9	47	30.9	2.0	**	9	31	29.4	2.1
10	46	31.7	1.9	**	10	35	29.9	2.2
11	43	32.3	2.2	**	11	30	30.3	1.9
12	44	32.8	2.5	**	12	27	31.0	2.2
13	42	33.8	3.0	**	13	29	31.4	2.2
14	39	35.4	3.0	**	14	25	32.3	2.4
15	32	36.4	3.0	**	15	19	32.7	2.9
16	23	38.0	2.8	**	16	9	32.6	2.9



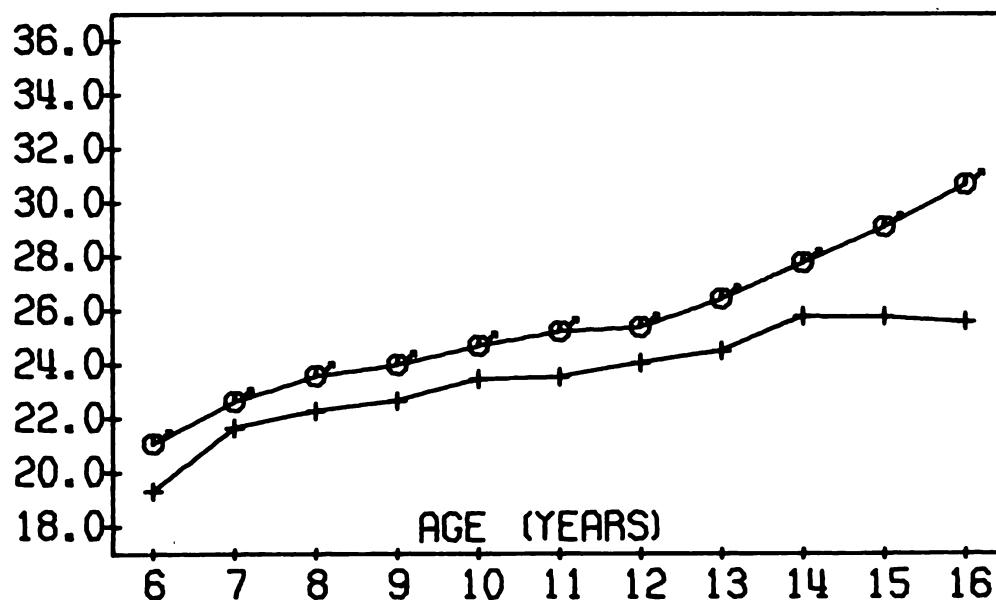
LINEAR MEASUREMENT  
Variable 99



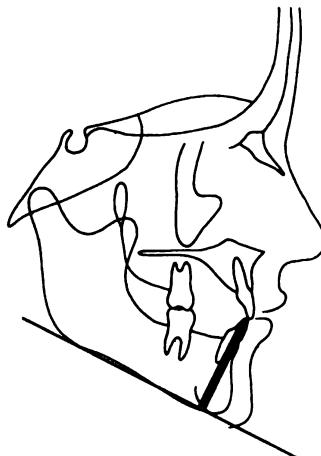
Lower Molar Mesial Cemento-  
Enamel Junction perpendicular  
to Mandibular Plane

LMJTG01-ME 17128-1

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	21.1	4.6		6	25	19.3	4.7
7	44	22.7	2.2		7	31	21.7	2.6
8	44	23.6	2.2		8	36	22.3	1.9
9	47	24.0	2.0	**	9	31	22.7	2.3
10	46	24.7	2.1	**	10	35	23.5	2.2
11	43	25.3	2.6	**	11	30	23.6	2.2
12	44	25.4	2.7	*	12	27	24.1	2.4
13	42	26.5	3.3	**	13	29	24.5	2.2
14	39	27.8	3.0	**	14	25	25.8	2.5
15	32	29.1	3.0	**	15	19	25.8	2.7
16	23	30.7	2.5	**	16	9	25.6	3.1



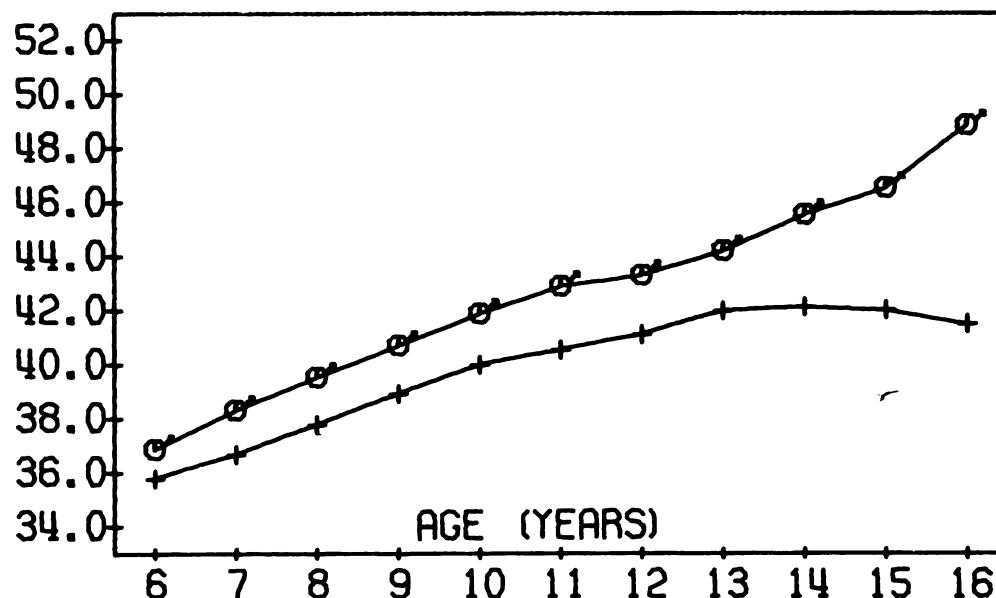
LINEAR MEASUREMENT  
Variable 101



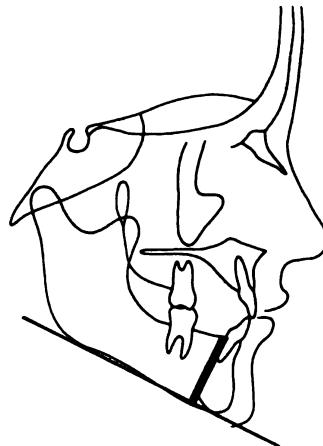
Lower Incisor Incisal Edge  
perpendicular to Mandibular  
Plane

LIE<sub>1</sub>G01-ME 6128-1

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	36.9	2.6		6	25	35.8	2.3
7	44	38.3	2.5	**	7	31	36.7	2.2
8	44	39.6	2.4	**	8	36	37.8	2.2
9	47	40.7	2.4	**	9	31	38.9	2.5
10	46	41.9	2.4	**	10	35	40.0	2.6
11	43	42.9	2.7	**	11	30	40.5	2.6
12	44	43.3	2.7	**	12	27	41.1	2.2
13	42	44.2	3.1	**	13	29	42.0	2.6
14	39	45.6	3.6	**	14	25	42.1	2.6
15	32	46.6	3.4	**	15	19	42.0	3.2
16	23	48.9	3.0	**	16	9	41.5	3.1



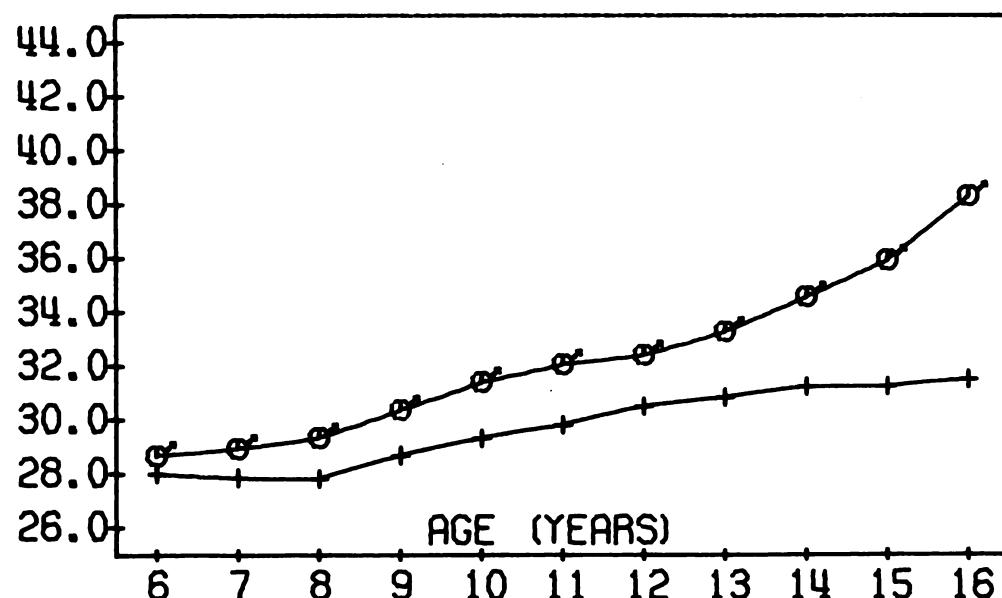
LINEAR MEASUREMENT  
Variable 100



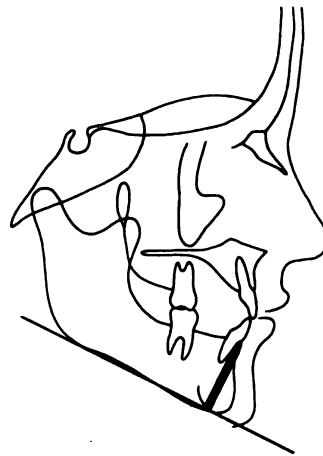
Lower Incisor Lingual Bony  
Contact Point perpendicular  
to Mandibular Plane

LIB|G01-ME 14|28-1

Age	N	Male		S.D.	**	Age	N	Female	
		Mean	S.D.					Mean	S.D.
6	37	28.7	2.5			6	25	28.0	2.5
7	44	29.0	2.1			7	31	27.9	2.1
8	44	29.4	2.2			8	36	27.8	2.0
9	47	30.4	2.3			9	31	28.7	2.4
10	46	31.4	2.5			10	35	29.3	2.9
11	43	32.1	2.5			11	30	29.8	2.6
12	44	32.4	2.9			12	27	30.5	2.5
13	42	33.3	3.3			13	29	30.8	2.6
14	39	34.6	3.7			14	25	31.2	2.3
15	32	35.9	3.2			15	19	31.2	2.6
16	23	38.3	2.9	**		16	9	31.5	3.9



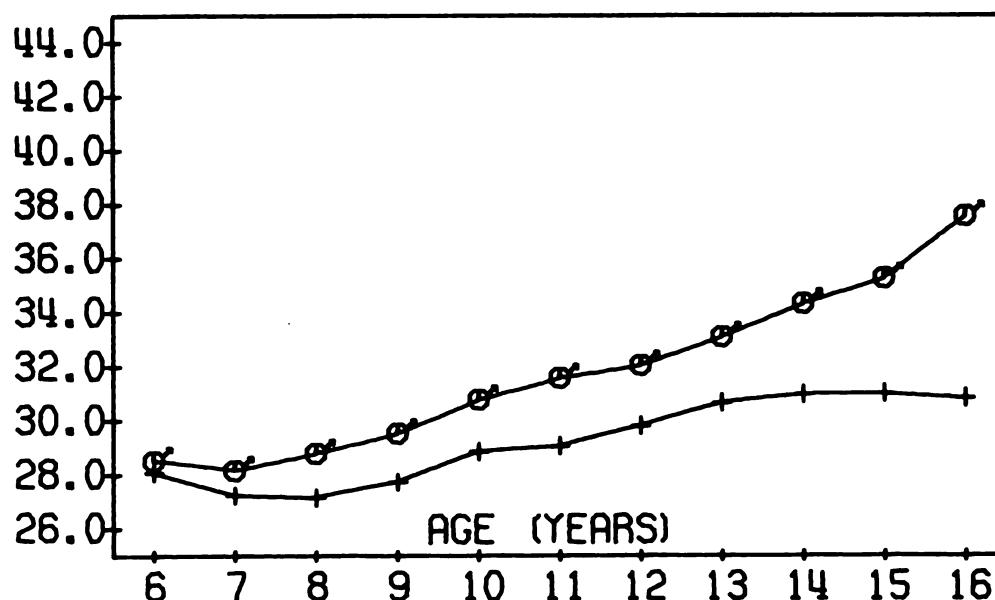
LINEAR MEASUREMENT  
Variable 102



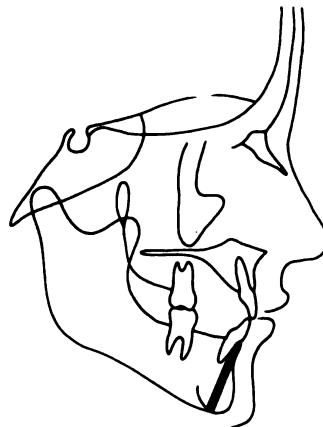
Infradentale perpendicular to  
Mandibular Plane

ID<sub>L</sub>G01-ME      5<sub>L</sub>28-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	28.5	2.6	6	25	28.1	3.2
7	44	28.2	2.4	7	31	27.3	2.3
8	44	28.8	2.1	8	36	27.2	2.2
9	47	29.5	2.3	9	31	27.7	2.7
10	46	30.8	2.3	10	35	28.8	2.4
11	43	31.6	2.5	11	30	29.0	2.6
12	44	32.0	2.5	12	27	29.8	1.6
13	42	33.1	2.9	13	29	30.6	2.0
14	39	34.3	3.1	14	25	31.0	1.9
15	32	35.3	3.2	15	19	31.0	2.3
16	23	37.6	2.9	16	9	30.8	2.9



LINEAR MEASUREMENT  
Variable 103

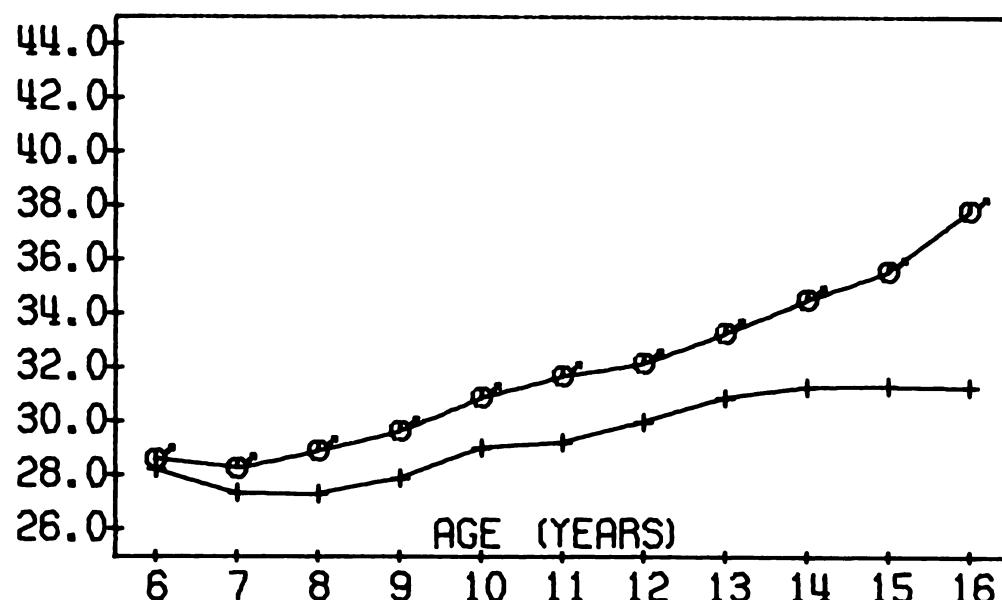


Infradentale-Menton

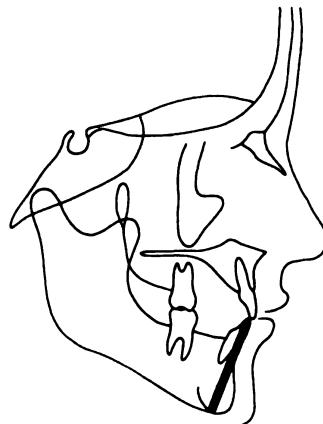
ID-ME

5-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	28.6	2.6	6	25	28.2	3.2
7	44	28.3	2.4	7	31	27.3	2.3
8	44	28.9	2.1	8	36	27.3	2.3
9	47	29.6	2.3	9	31	27.9	2.7
10	46	30.9	2.3	10	35	29.0	2.5
11	43	31.7	2.4	11	30	29.2	2.7
12	44	32.2	2.5	12	27	30.0	1.7
13	42	33.3	2.9	13	29	30.9	2.1
14	39	34.6	3.1	14	25	31.3	2.0
15	32	35.6	3.1	15	19	31.3	2.3
16	23	37.9	2.9	16	9	31.3	2.8



LINEAR MEASUREMENT  
Variable 104

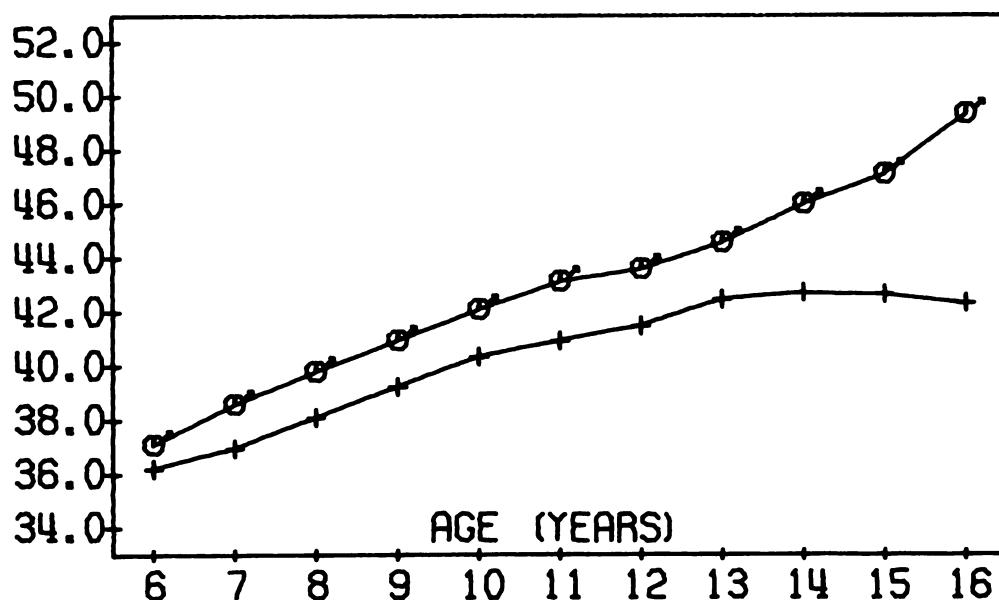


Lower Incisor Incisal Edge-  
Menton

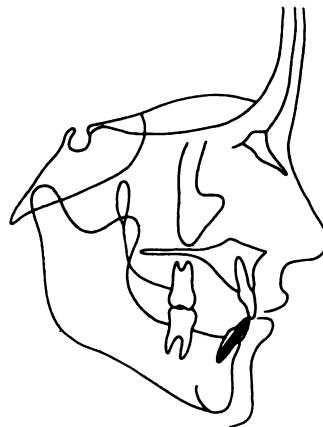
LIE-ME

6-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	37.1	2.6	6	25	36.2	2.2
7	44	38.6	2.5	7	31	37.0	2.2
8	44	39.8	2.3	8	36	38.1	2.2
9	47	41.0	2.4	9	31	39.2	2.6
10	46	42.1	2.4	10	35	40.4	2.7
11	43	43.2	2.7	11	30	40.9	2.7
12	44	43.6	2.7	12	27	41.5	2.2
13	42	44.6	3.2	13	29	42.5	2.6
14	39	46.0	3.5	14	25	42.7	2.6
15	32	47.1	3.3	15	19	42.7	3.1
16	23	49.4	2.9	16	9	42.3	2.7

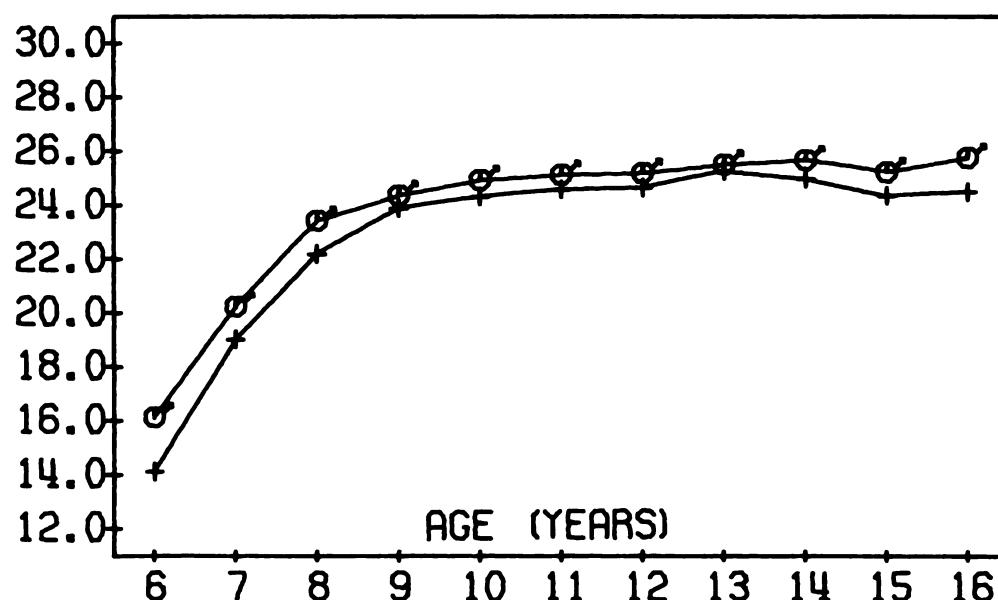


LINEAR MEASUREMENT  
Variable 105

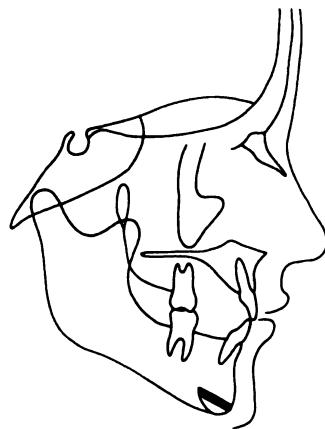


Lower Incisor Incisal Edge-  
Lower Incisor Apex  
LIE-LIA 6-15

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	16.1	5.4	6	25	14.1	5.1
7	43	20.3	4.1	7	31	19.0	4.1
8	44	23.4	1.9	8	36	22.2	2.5
9	47	24.4	1.9	9	31	23.9	1.9
10	46	24.9	1.5	10	35	24.3	1.7
11	43	25.1	1.8	11	30	24.6	1.5
12	44	25.2	2.0	12	27	24.6	1.4
13	43	25.5	1.8	13	29	25.3	2.0
14	40	25.7	2.1	14	25	25.0	1.8
15	33	25.2	1.8	15	19	24.3	1.0
16	23	25.8	1.8	16	9	24.5	0.9



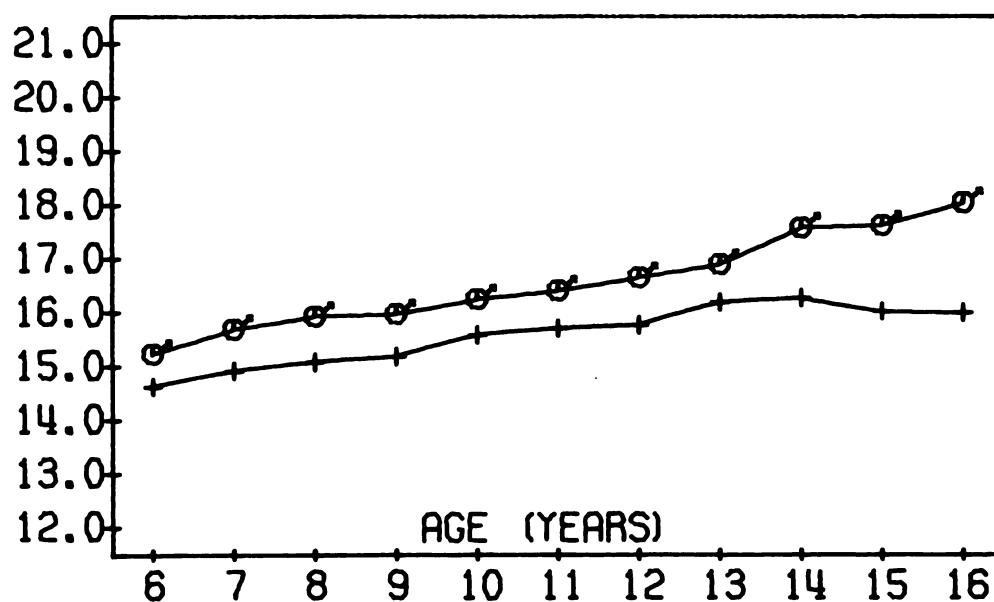
LINEAR MEASUREMENT  
Variable 106



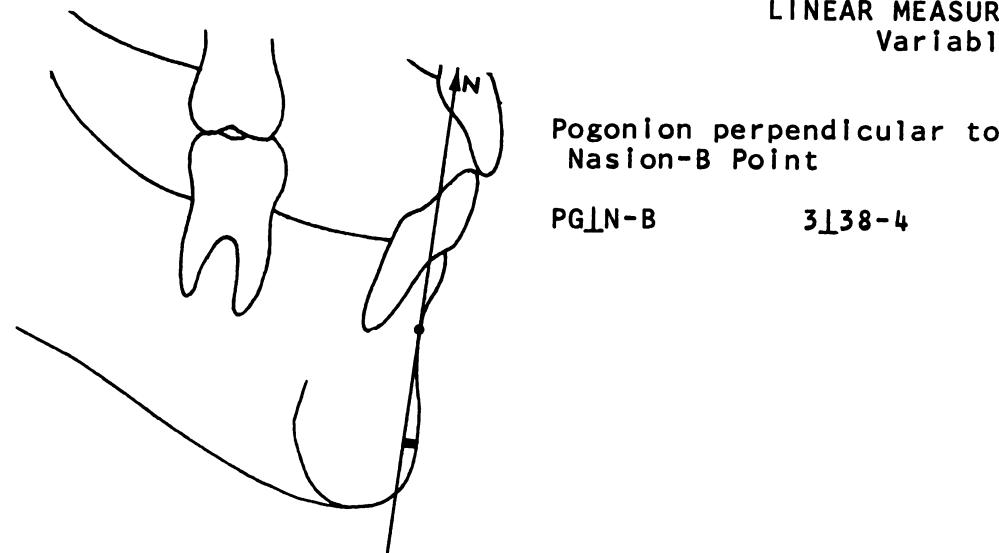
Pogonion-Lingual Symphyseal  
Point

PG-SYMP      3-16

Age	N	Male			Age	N	Female		
		Mean mm	S.D. mm	*			Mean mm	S.D. mm	
6	37	15.2	1.1		6	25	14.6	1.8	
7	44	15.7	1.3		7	31	14.9	1.8	
8	44	15.9	1.3	**	8	36	15.1	1.6	
9	47	16.0	1.4	*	9	31	15.2	1.8	
10	46	16.3	1.3		10	35	15.6	1.9	
11	43	16.4	1.5		11	30	15.7	1.8	
12	44	16.7	1.4	*	12	27	15.8	1.8	
13	43	16.9	1.6		13	29	16.2	2.0	
14	40	17.6	1.8	**	14	25	16.3	1.8	
15	33	17.6	1.7	**	15	19	16.0	1.7	
16	23	18.1	1.6	**	16	9	16.0	1.8	



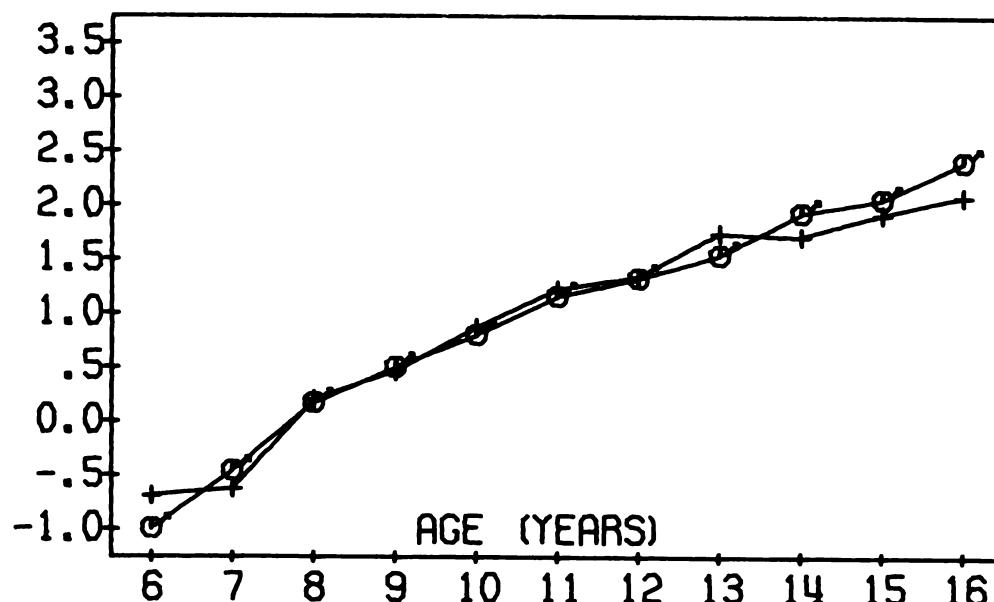
LINEAR MEASUREMENT  
Variable 107



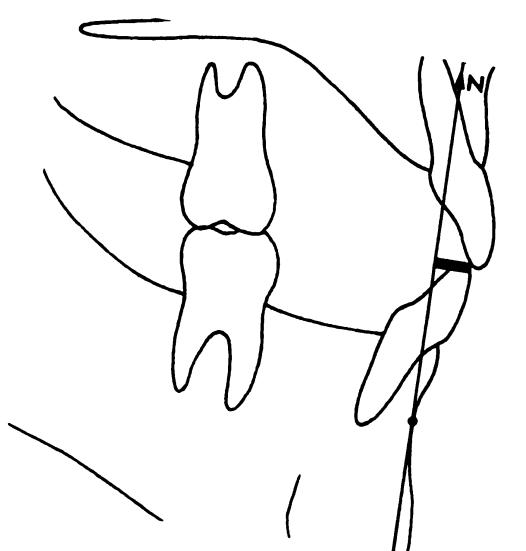
Pogonion perpendicular to  
Nasion-B Point

PG $\perp$ N-B      3138-4

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	-1.0	1.7	6	25	-0.7	1.5
7	44	-0.5	1.5	7	31	-0.6	1.3
8	44	0.2	1.4	8	36	0.2	1.3
9	47	0.5	1.3	9	31	0.5	1.6
10	46	0.8	1.6	10	35	0.9	1.1
11	43	1.2	1.5	11	30	1.2	1.2
12	44	1.3	1.6	12	27	1.3	1.5
13	43	1.5	1.8	13	29	1.7	1.3
14	40	1.9	1.6	14	25	1.7	1.6
15	33	2.1	1.8	15	19	1.9	1.4
16	23	2.4	2.5	16	9	2.1	1.6



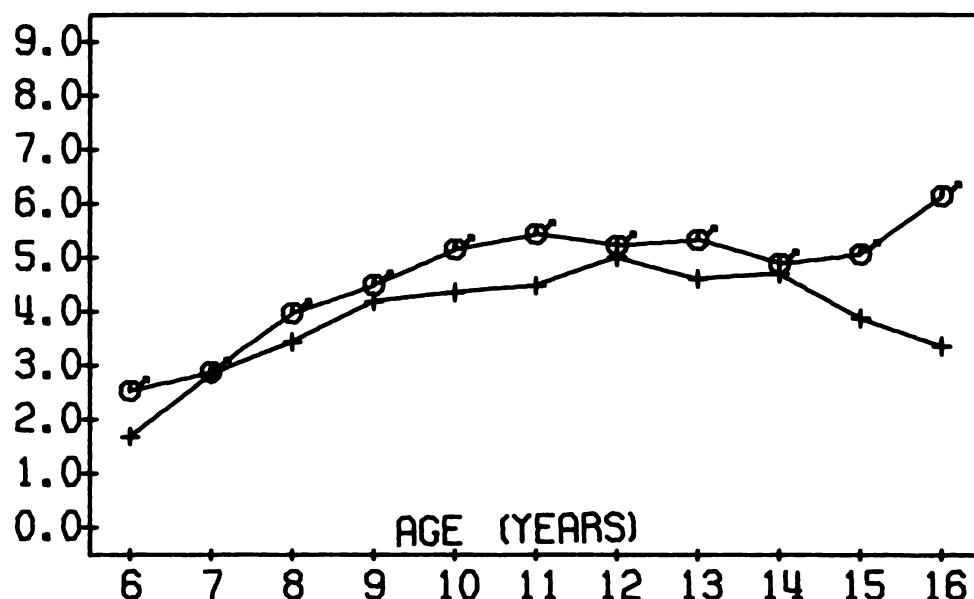
**LINEAR MEASUREMENT**  
Variable 108



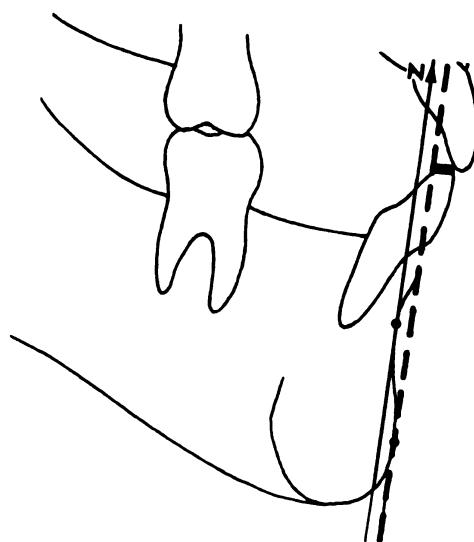
Lower Incisor Incisal Edge  
perpendicular to Nasion-  
B Point

LIE\_N-B      6138-4

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	37	2.5	2.2	6	25	1.7	2.3
7	44	2.9	2.3	7	31	2.8	2.1
8	44	4.0	2.5	8	36	3.4	2.3
9	47	4.5	2.4	9	31	4.2	2.3
10	46	5.2	2.3	10	35	4.4	2.1
11	43	5.4	2.5	11	30	4.5	2.3
12	44	5.2	2.6	12	27	5.0	2.5
13	43	5.3	2.8	13	29	4.6	2.4
14	40	4.9	2.8	14	25	4.7	2.6
15	33	5.1	2.7	15	19	3.9	2.8
16	23	6.1	2.9	*	16	9	3.4
			*				3.6



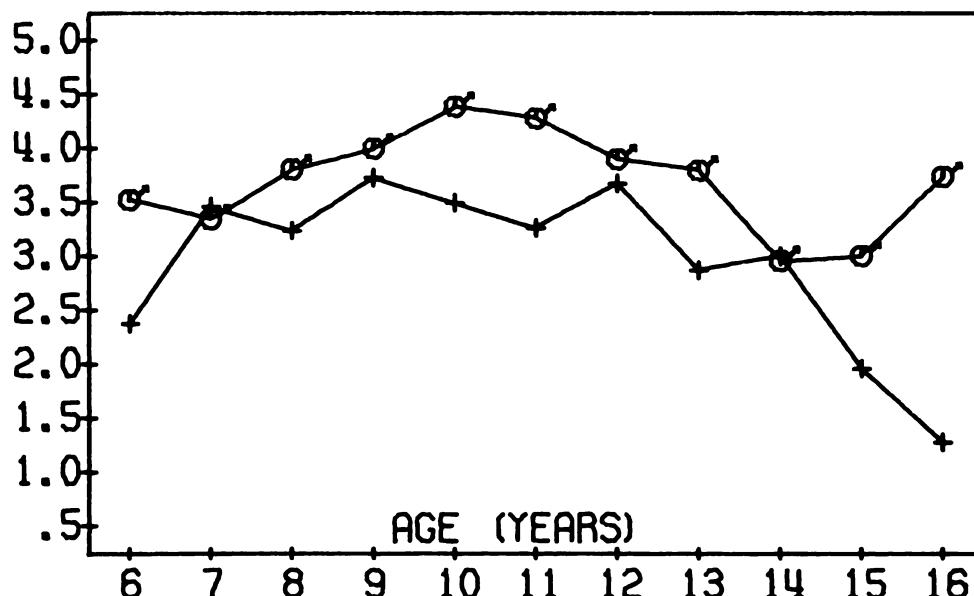
LINEAR MEASUREMENT  
Variable 109



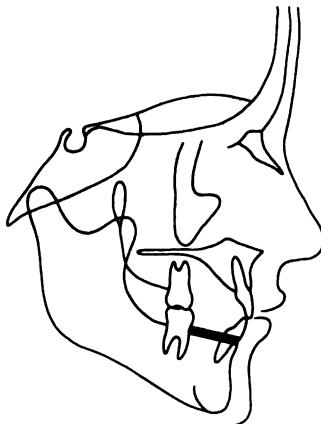
Lower Incisor Incisal Edge  
perpendicular to Pogonion  
parallel to Nasion-B Point

LIE<sub>N-B</sub>/PG<sub>N-B</sub> 6<sub>1</sub>38-4/  
3<sub>1</sub>38-4

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	3.5	3.4	6	25	2.4	3.4
7	44	3.3	3.3	7	31	3.5	2.7
8	44	3.8	3.5	8	36	3.2	3.0
9	46	4.0	3.3	9	31	3.7	3.4
10	45	4.4	3.5	10	35	3.5	2.6
11	43	4.3	3.6	11	30	3.3	2.9
12	44	3.9	3.8	12	27	3.7	3.5
13	43	3.8	4.1	13	29	2.9	3.2
14	40	3.0	3.7	14	25	3.0	3.8
15	33	3.0	3.8	15	19	2.0	3.6
16	23	3.7	5.0	16	9	1.3	4.5



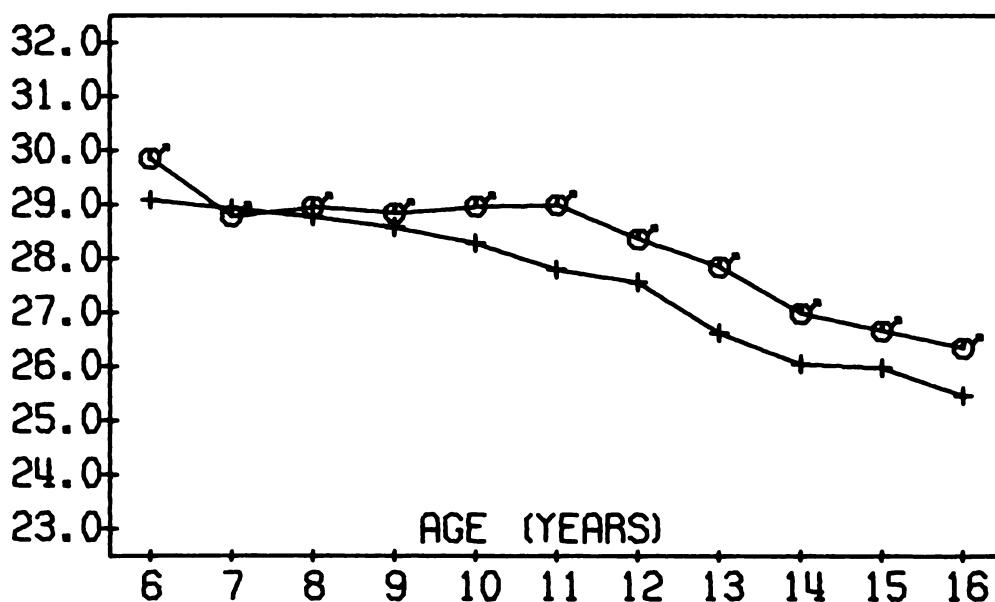
**LINEAR MEASUREMENT  
Variable 110**



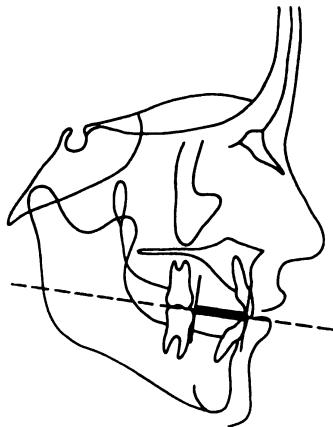
Infradentale perpendicular to  
Lower Molar Mesial Cemento-  
Enamel Junction

ID-LMJ                    5-17

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	22	29.8	1.9	6	18	29.1	2.5
7	40	28.8	1.5	*	7	26	28.9
8	43	29.0	1.5		8	35	28.8
9	47	28.8	1.8		9	31	28.6
10	46	29.0	1.8	10	35	28.3	2.2
11	43	29.0	1.7	**	11	30	27.8
12	44	28.4	2.1		12	27	27.6
13	42	27.8	2.1	*	13	29	26.6
14	39	27.0	2.0		14	25	26.0
15	30	26.7	2.3		15	19	26.0
16	22	26.3	1.9		16	9	25.5



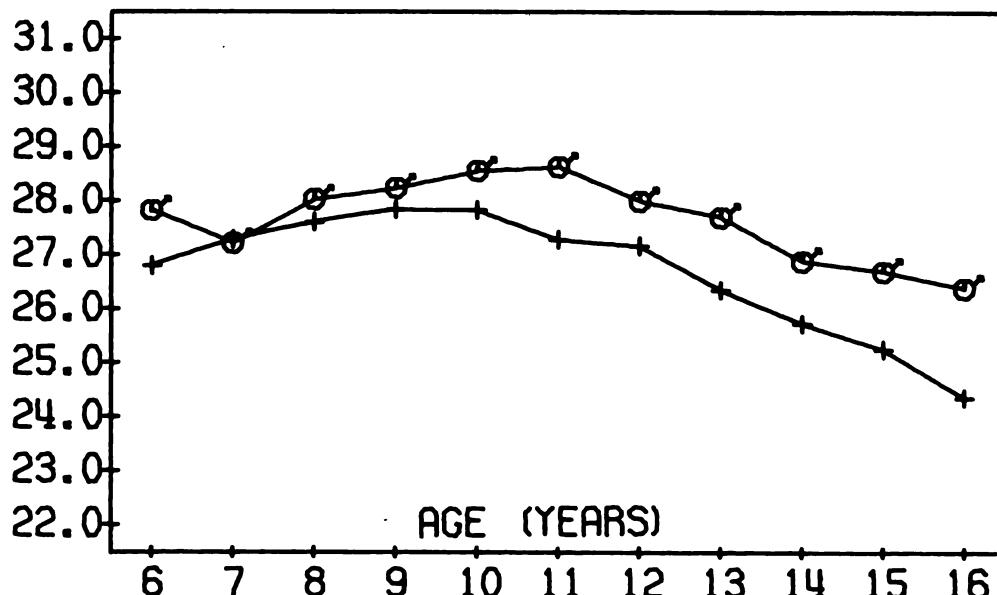
LINEAR MEASUREMENT  
Variable 111



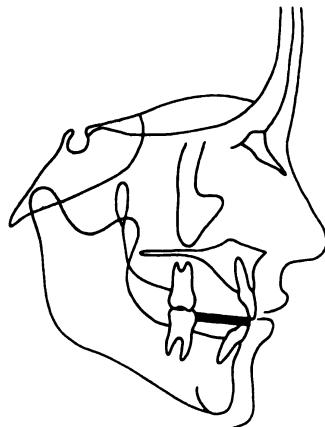
Lower Molar Mesial Contact  
Point perpendicular to Lower  
Incisor Incisal Edge  
on Downs Occlusal Plane

ADP-PDP $\perp$ LMC- 56-57 $\pm$ 54-  
ADP-PDP $\perp$ LIE 56-57 $\pm$ 6

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	22	27.8	1.8	6	18	26.8	2.6
7	40	27.2	1.7	*	7	26	27.3
8	43	28.0	1.7		8	35	27.6
9	47	28.2	1.8		9	31	27.8
10	46	28.6	1.6		10	34	27.8
11	43	28.6	2.0	**	11	30	27.3
12	44	28.0	2.1		12	27	27.2
13	41	27.7	2.1	**	13	29	26.4
14	38	26.9	2.0	*	14	24	25.7
15	29	26.7	1.9	*	15	19	25.3
16	22	26.4	1.6	**	16	9	24.4



LINEAR MEASUREMENT  
Variable 112

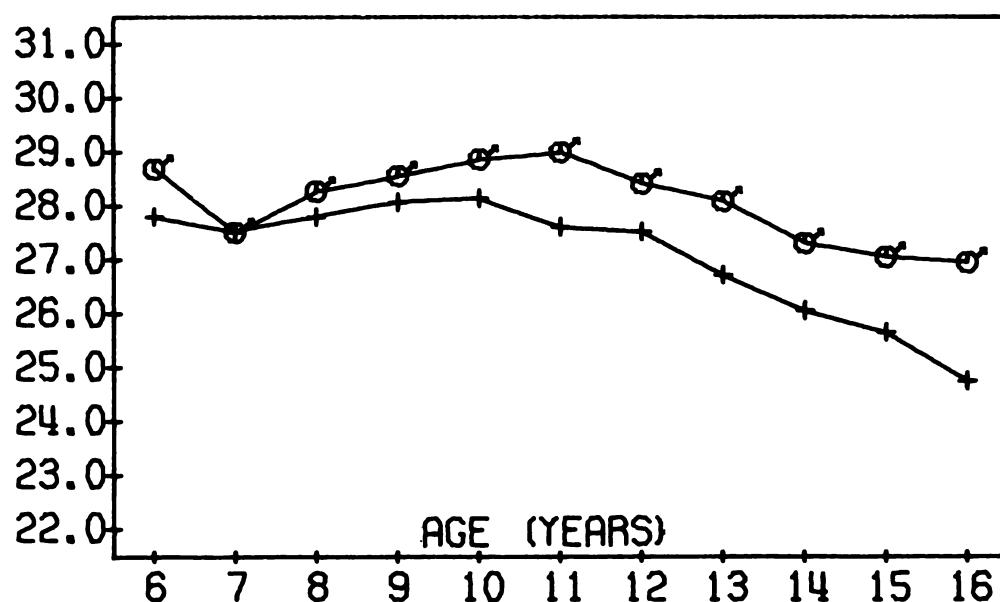


Lower Incisor Incisal Edge-  
Lower Molar Mesial Contact  
Point

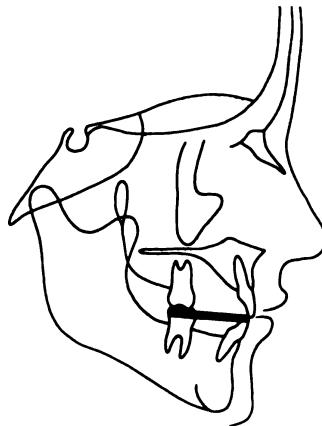
LIE-LMC

6-54

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	22	28.7	2.1	6	18	27.8	2.8
7	40	27.5	1.8	7	26	27.5	2.5
8	43	28.3	1.8	8	35	27.8	2.1
9	47	28.6	1.8	9	31	28.1	2.3
10	46	28.9	1.6	10	34	28.1	2.3
11	43	29.0	2.0	11	30	27.6	2.3
12	44	28.4	2.1	12	27	27.5	2.7
13	41	28.1	2.0	13	29	26.7	2.3
14	38	27.3	2.0	14	24	26.1	2.2
15	29	27.0	1.9	15	19	25.7	2.4
16	22	27.0	1.6	16	9	24.8	2.0



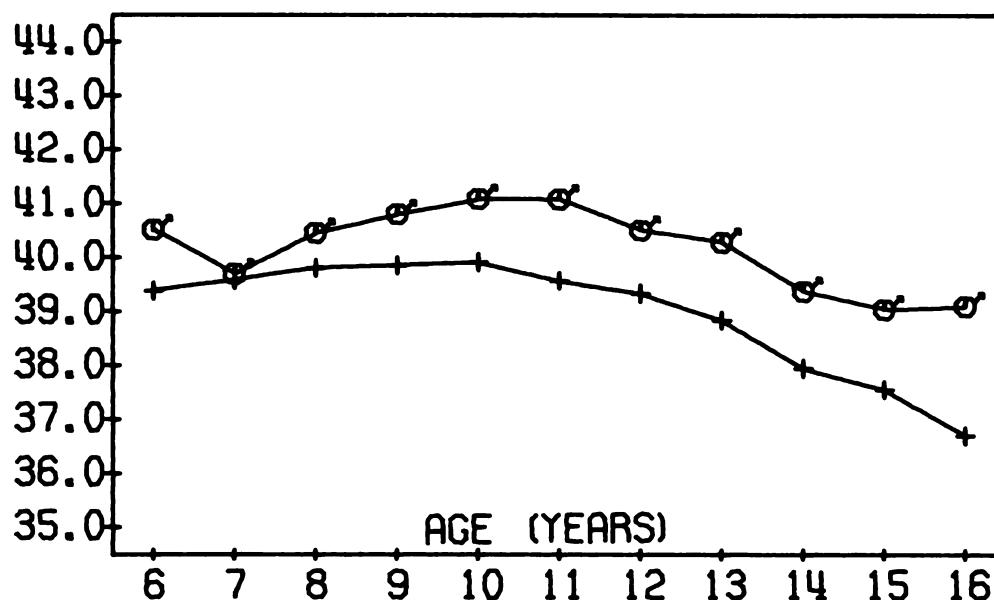
LINEAR MEASUREMENT  
Variable 113



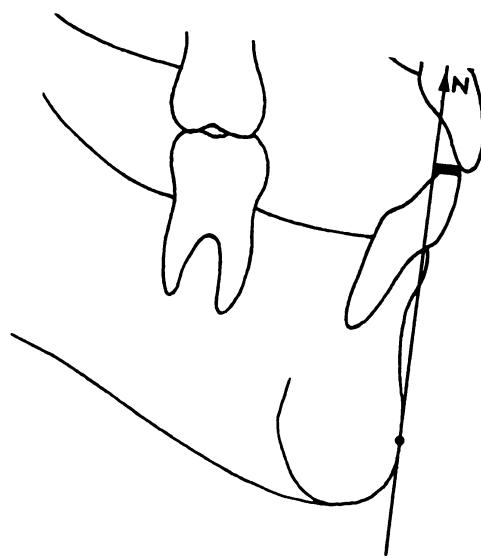
Lower Incisor Incisal Edge-  
Lower Molar Distal Contact  
Point

LIE-LDC      6-25

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	22	40.5	2.1	6	18	39.4	3.1
7	40	39.7	1.9	7	26	39.6	2.6
8	43	40.5	1.9	8	35	39.8	2.3
9	47	40.8	2.0	9	31	39.9	2.5
10	46	41.1	1.7	10	35	39.9	2.3
11	43	41.1	2.2	11	30	39.6	2.4
12	44	40.5	2.2	12	27	39.3	2.8
13	42	40.3	2.3	13	29	38.8	2.3
14	39	39.4	2.5	14	25	37.9	2.1
15	30	39.0	2.5	15	19	37.6	2.2
16	22	39.1	2.0	16	9	36.7	1.7



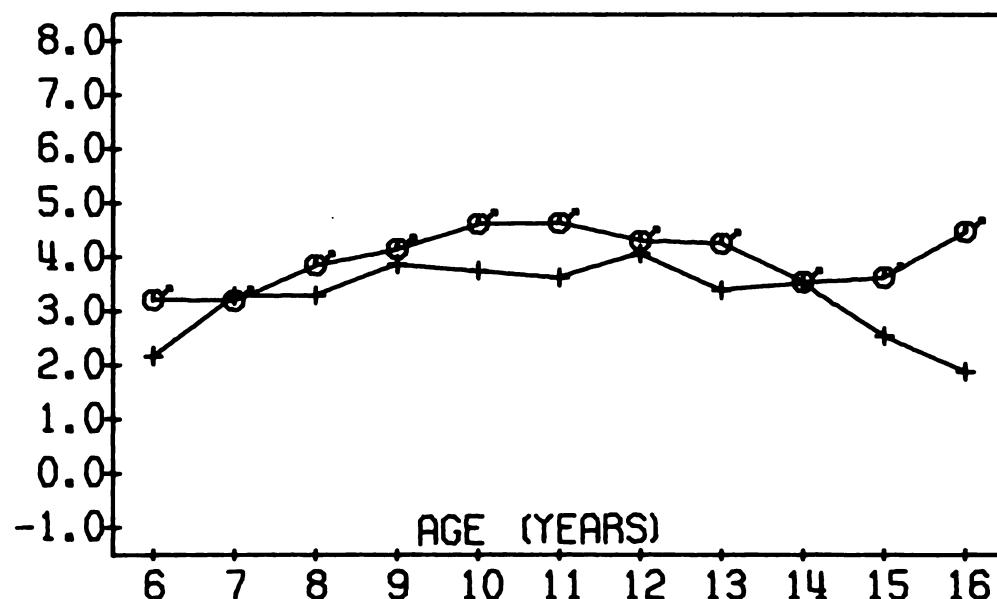
LINEAR MEASUREMENT  
Variable 114



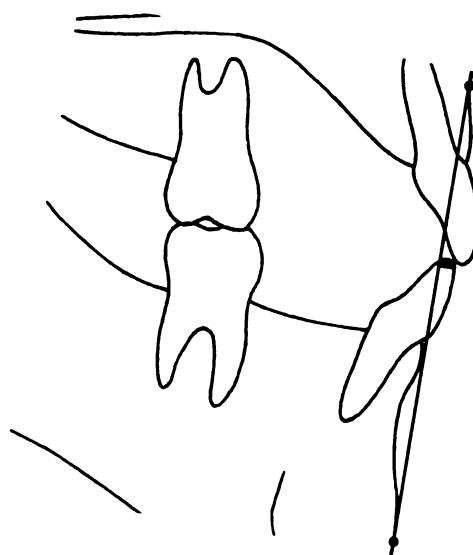
Lower Incisor Incisal Edge  
perpendicular to Nasion-  
Pogonion

LIE\_N-PG      6138-3

Age	N	Male		Female	
		Mean	S.D.	Mean	S.D.
6	37	3.2	3.0	2.2	3.1
7	44	3.2	3.0	3.3	2.5
8	44	3.9	3.1	3.3	2.7
9	46	4.2	3.0	3.9	3.0
10	45	4.6	3.1	3.8	2.5
11	43	4.6	3.2	3.6	2.7
12	44	4.3	3.4	4.1	3.1
13	43	4.3	3.7	3.4	3.0
14	40	3.6	3.3	3.5	3.4
15	33	3.6	3.4	2.5	3.3
16	23	4.5	4.3	1.9	4.2



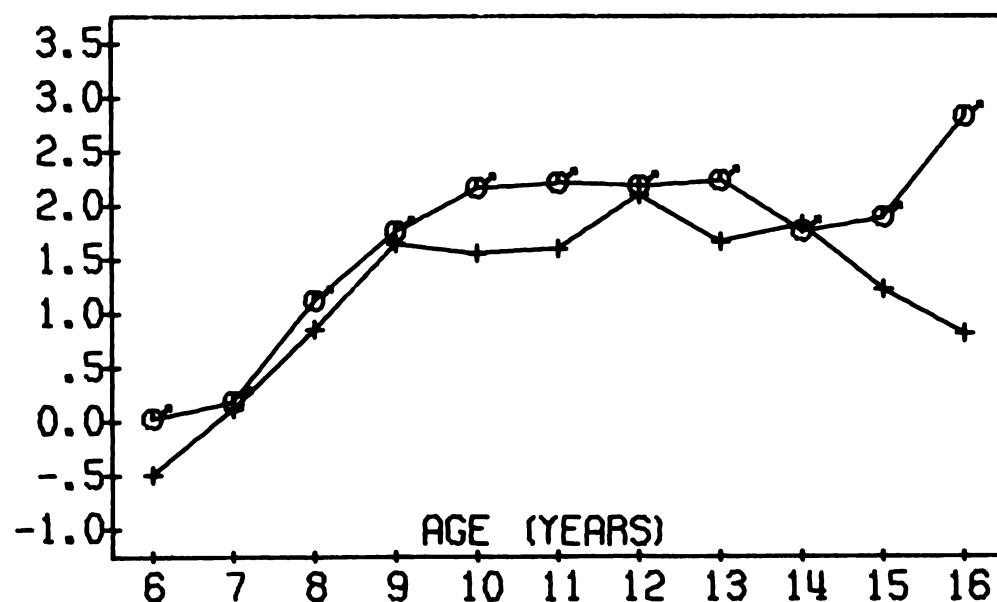
LINEAR MEASUREMENT  
Variable 115



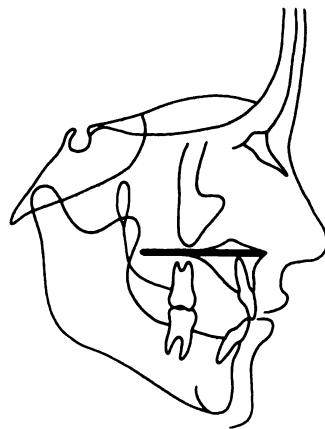
Lower Incisor Incisal Edge  
perpendicular to A Point-  
Pogonion  
Ricketts Analysis

LIE<sub>1A</sub>-PG      6<sub>1A</sub>-PG

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	0.0	2.2	6	25	-0.5	2.7
7	44	0.2	2.5	7	31	0.1	2.5
8	44	1.1	2.5	8	36	0.9	2.4
9	46	1.8	2.4	9	31	1.6	2.7
10	45	2.2	2.4	10	35	1.6	1.8
11	43	2.2	2.3	11	30	1.6	2.3
12	44	2.2	2.6	12	27	2.1	2.5
13	43	2.2	2.6	13	29	1.7	2.3
14	40	1.8	2.5	14	25	1.8	2.4
15	33	1.9	2.6	15	19	1.2	2.5
16	23	2.8	2.9	16	9	0.8	2.8



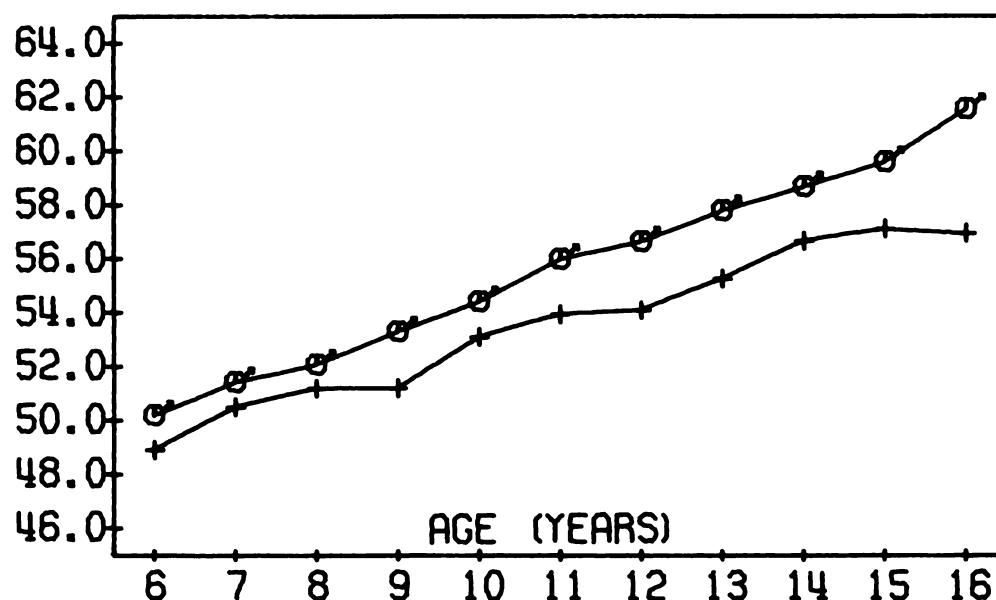
LINEAR MEASUREMENT  
Variable 116



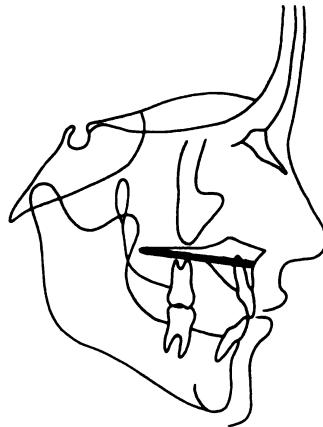
Posterior Nasal Spine-Anterior  
Nasal Spine

PNS-ANS                  45-10

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	50.2	2.2	*	6	24	48.9	2.3
7	44	51.4	2.5		7	31	50.5	2.9
8	44	52.1	2.9		8	36	51.2	2.5
9	47	53.3	2.9	**	9	31	51.2	3.2
10	46	54.4	2.6	*	10	35	53.1	3.1
11	43	56.0	2.4	**	11	30	53.9	4.0
12	44	56.7	3.1	**	12	27	54.1	3.2
13	43	57.8	3.1	**	13	29	55.3	3.0
14	39	58.7	3.6	*	14	25	56.7	2.9
15	33	59.6	3.6	**	15	19	57.1	2.7
16	23	61.6	3.7	**	16	9	57.0	4.4

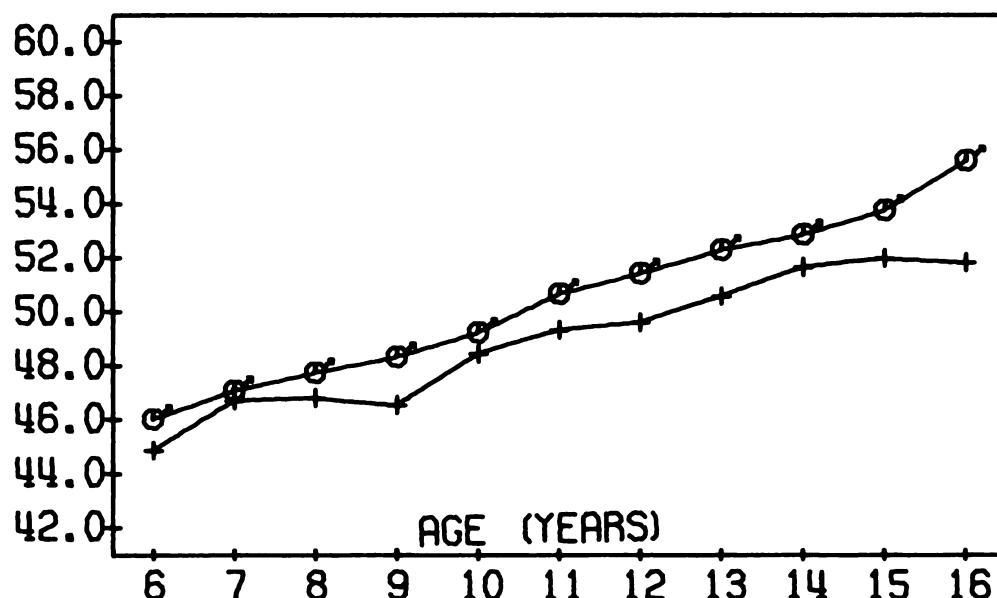


LINEAR MEASUREMENT  
Variable 117

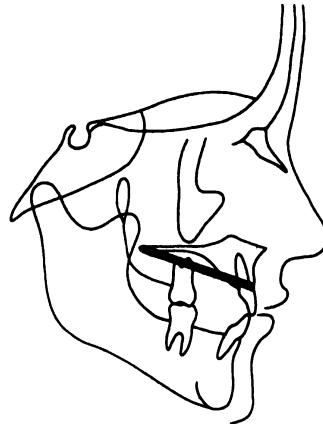


Posterior Nasal Spine-A Point  
PNS-A                  45-9

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	46.0	1.9	*	6	24	44.9	2.3
7	44	47.1	2.2		7	31	46.7	2.6
8	44	47.8	2.5		8	36	46.8	2.4
9	47	48.4	2.7	**	9	31	46.6	2.8
10	46	49.2	2.2		10	35	48.4	3.2
11	43	50.7	2.0	*	11	30	49.3	3.5
12	44	51.5	2.7	**	12	27	49.6	2.9
13	43	52.3	2.8	**	13	29	50.6	3.1
14	39	52.9	3.3		14	25	51.7	2.6
15	33	53.8	3.4	*	15	19	52.0	2.6
16	23	55.6	3.5	**	16	9	51.8	3.9



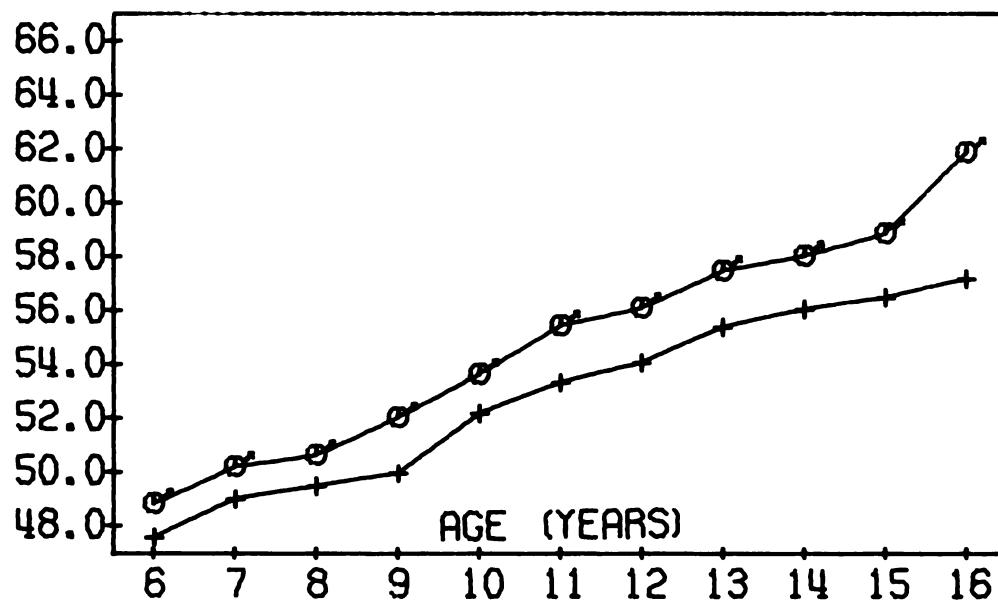
LINEAR MEASUREMENT  
Variable 118



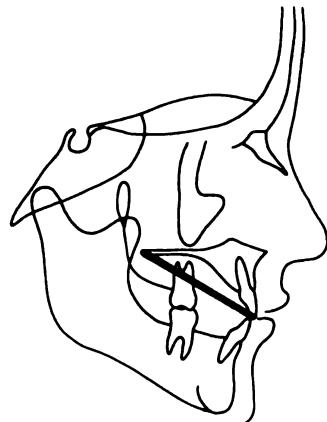
Posterior Nasal Spine-  
Supradentale

PNS-SD      45-8

Age	N	Male			Age	N	Female		
		Mean mm	S.D. mm	*			Mean mm	S.D. mm	
6	37	48.9	2.0	*	6	24	47.6	2.7	
7	44	50.2	2.3		7	31	49.0	2.9	
8	44	50.7	3.0		8	36	49.5	2.7	
9	47	52.1	2.9	**	9	31	50.0	3.3	
10	46	53.7	2.7	*	10	35	52.2	3.4	
11	43	55.5	2.2	**	11	30	53.3	3.9	
12	44	56.1	3.0	**	12	27	54.1	3.3	
13	43	57.5	3.4	**	13	29	55.4	3.0	
14	39	58.1	3.4	**	14	25	56.1	2.8	
15	33	58.9	4.4	*	15	19	56.5	3.0	
16	23	61.9	3.7	**	16	9	57.2	4.5	



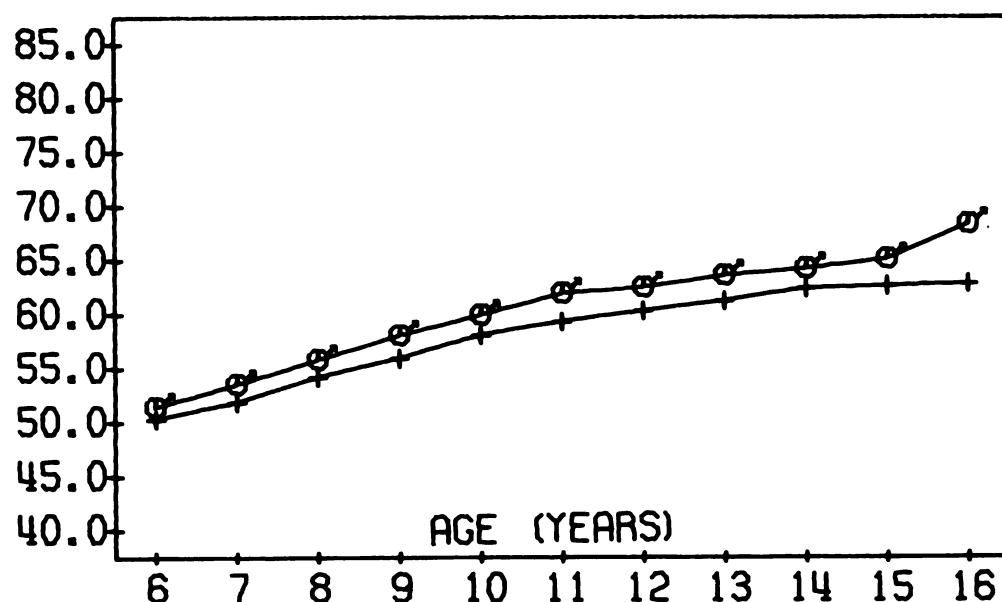
LINEAR MEASUREMENT  
Variable 119



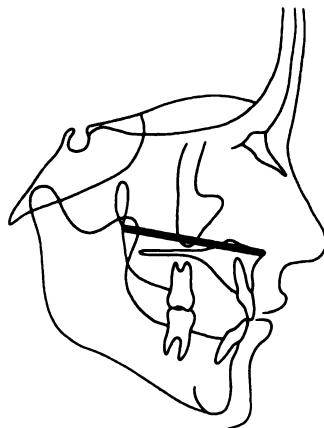
Posterior Nasal Spine-Upper  
Incisor Incisal Edge

PNS-UIE      45-7

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	51.5	2.7	6	24	50.3	3.2	
7	44	53.6	2.9	7	31	51.9	3.4	
8	44	55.9	3.7	*	8	36	54.2	3.6
9	47	58.2	3.8	**	9	31	56.0	3.7
10	46	60.1	3.1	**	10	35	58.1	3.5
11	43	62.1	2.7	**	11	30	59.4	4.1
12	44	62.6	3.3	**	12	27	60.3	3.8
13	43	63.7	3.8	**	13	29	61.2	3.2
14	39	64.3	3.8	*	14	25	62.4	3.2
15	33	65.2	4.8		15	19	62.6	3.7
16	23	68.4	3.9	**	16	9	62.8	4.8



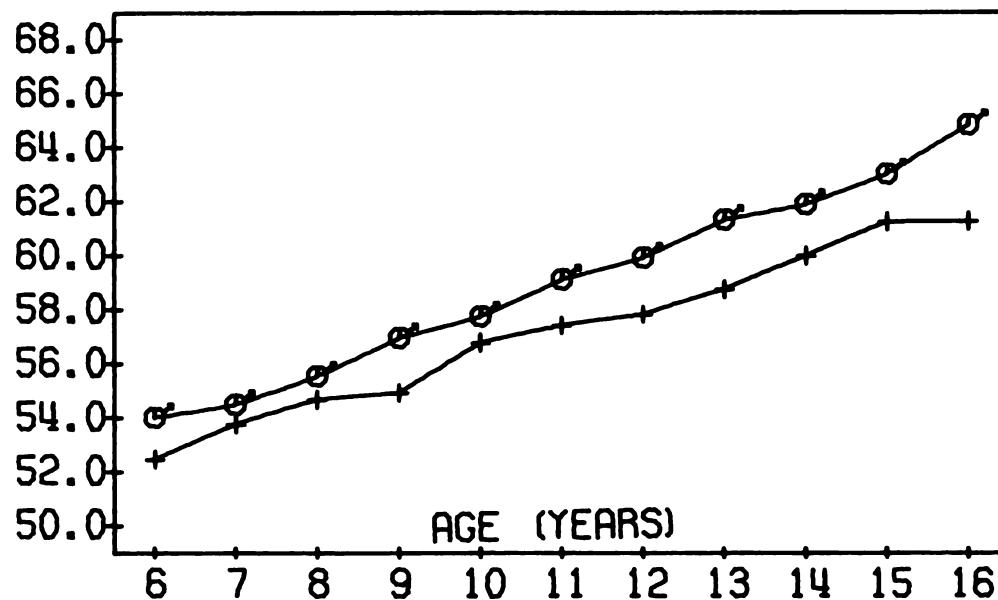
LINEAR MEASUREMENT  
Variable 120



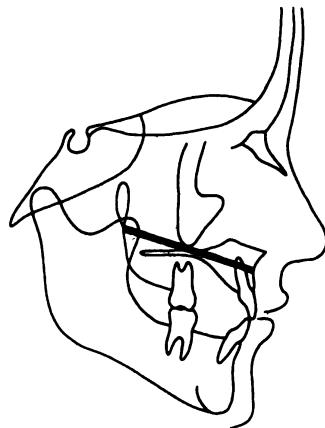
Pterygo-Maxillary Fissure,  
Inferior-Anterior Nasal Spine

PTM-ANS      43-10

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	54.0	2.2		6	25	52.5	2.1
7	44	54.5	2.5		7	31	53.8	2.6
8	44	55.6	2.8		8	36	54.7	2.7
9	47	57.0	2.9	**	9	31	54.9	2.7
10	46	57.8	2.3		10	35	56.8	3.1
11	43	59.1	2.5	**	11	30	57.4	3.3
12	44	60.0	3.2	**	12	27	57.8	3.1
13	43	61.4	2.8	**	13	29	58.8	3.4
14	40	61.9	3.5	*	14	25	60.0	3.5
15	33	63.0	3.0		15	19	61.3	3.6
16	23	64.9	3.3	*	16	9	61.3	4.8



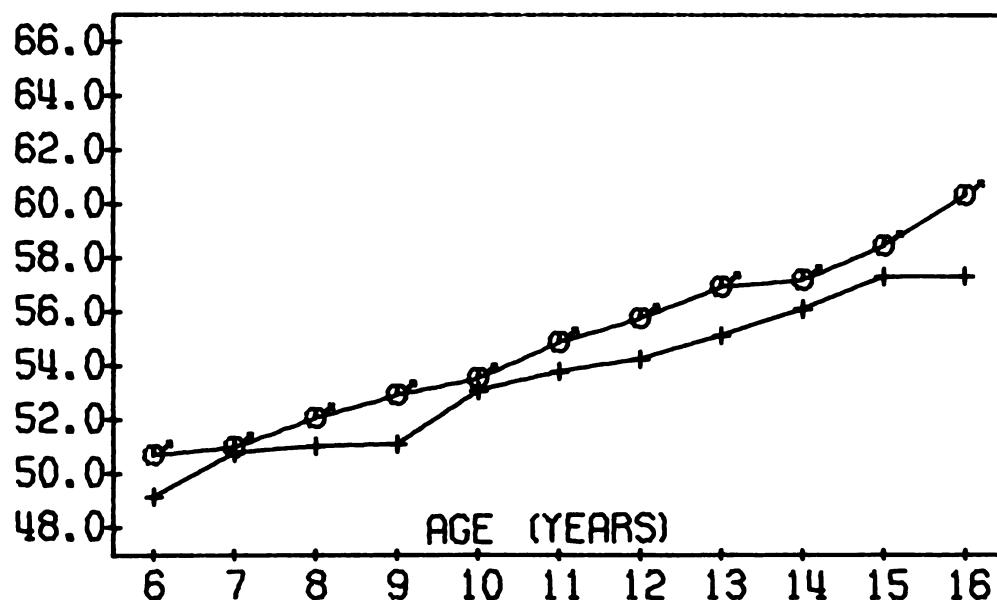
LINEAR MEASUREMENT  
Variable 121



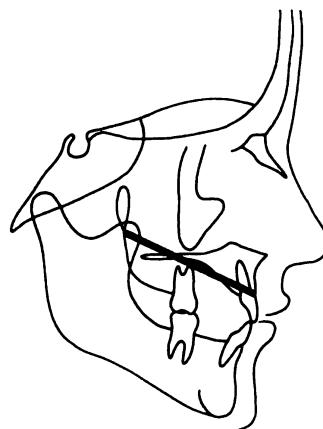
Pterygo-Maxillary Fissure  
Inferior-A Point

PTM-A                  43-9

Age	N	Male			Age	N	Female		
		Mean mm	S.D. mm	**			Mean mm	S.D. mm	
6	37	50.7	2.1	**	6	25	49.1	2.1	
7	44	51.0	2.8		7	31	50.8	2.6	
8	44	52.1	2.7		8	36	51.0	2.6	
9	47	53.0	2.7	**	9	31	51.1	2.7	
10	46	53.6	2.1		10	35	53.1	3.2	
11	43	54.9	2.3		11	30	53.8	3.0	
12	44	55.8	3.4		12	27	54.3	2.9	
13	43	57.0	2.6	**	13	29	55.1	3.4	
14	40	57.2	3.5		14	25	56.1	3.1	
15	33	58.5	3.1		15	19	57.3	3.4	
16	23	60.4	3.5	*	16	9	57.3	4.3	



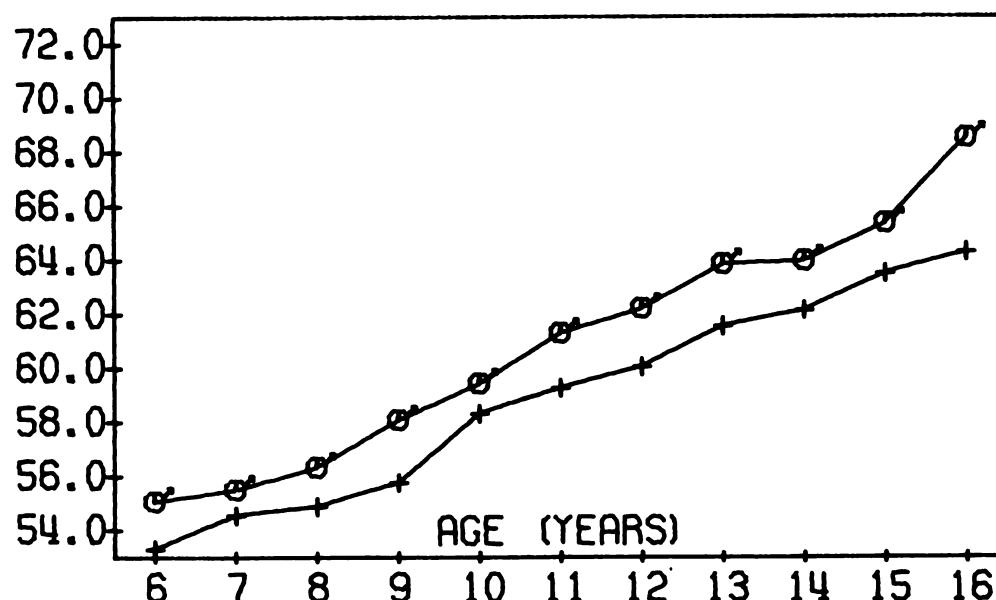
LINEAR MEASUREMENT  
Variable 122



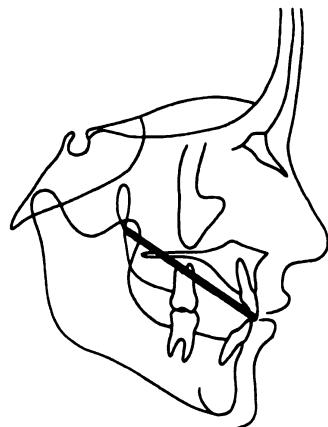
Pterygo-Maxillary Fissure,  
Inferior-Supradentale

PTM-SD      43-8

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	55.1	2.2	**	6	25	53.3	2.5
7	44	55.5	3.0		7	31	54.6	2.8
8	44	56.3	3.3	*	8	36	54.9	3.1
9	47	58.1	3.1	**	9	31	55.8	3.3
10	46	59.4	2.8		10	35	58.3	3.4
11	43	61.3	2.7	**	11	30	59.3	3.5
12	44	62.2	3.4	**	12	27	60.1	3.1
13	43	63.9	3.3	**	13	29	61.5	3.2
14	40	64.0	3.7	*	14	25	62.1	3.1
15	33	65.4	4.0		15	19	63.5	3.3
16	23	68.5	3.9	**	16	9	64.3	4.7



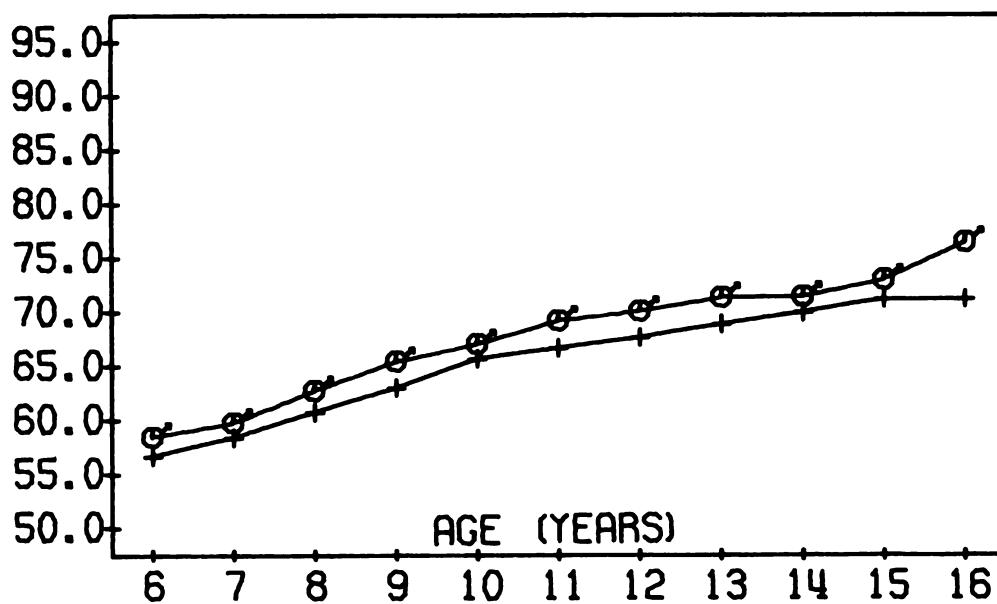
LINEAR MEASUREMENT  
Variable 123



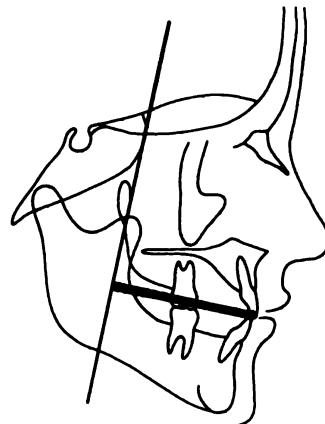
Pterygo-Maxillary Fissure,  
Inferior-Upper Incisor Incisal  
Edge

PTM-UIE      43-7

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	58.5	2.9	*	6	25	56.7	3.3
7	44	59.8	3.7		7	31	58.4	3.4
8	44	62.8	4.2	*	8	36	60.8	3.9
9	47	65.5	4.0	**	9	31	63.0	3.6
10	46	67.1	3.2		10	35	65.7	3.5
11	43	69.2	3.3	**	11	30	66.7	3.8
12	44	70.1	3.9	**	12	27	67.6	3.5
13	43	71.4	3.7	**	13	29	68.9	3.2
14	40	71.5	4.4		14	25	70.0	3.2
15	33	73.1	4.6		15	19	71.2	3.7
16	23	76.5	4.2	**	16	9	71.2	4.8



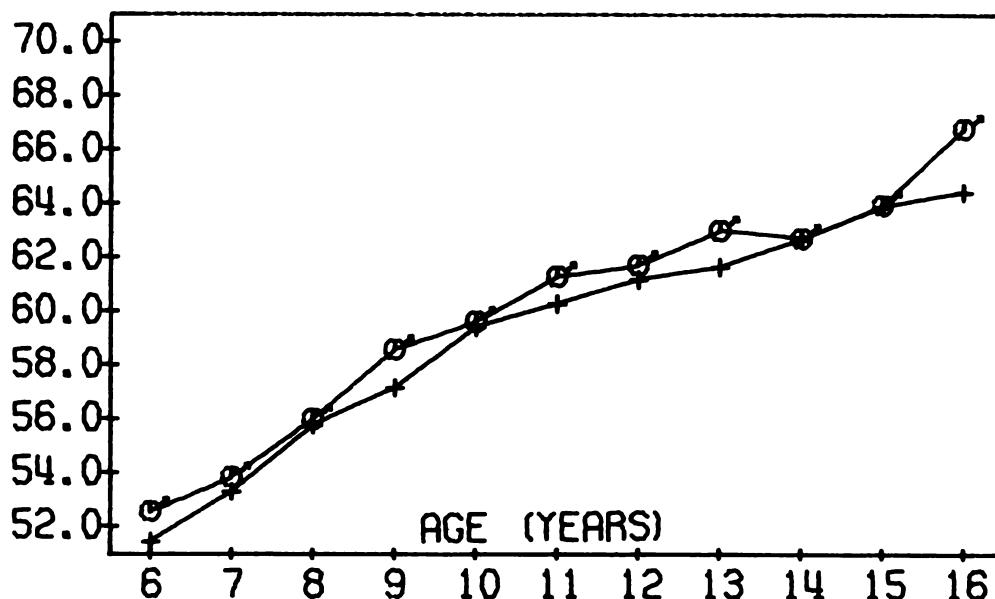
LINEAR MEASUREMENT  
Variable 124



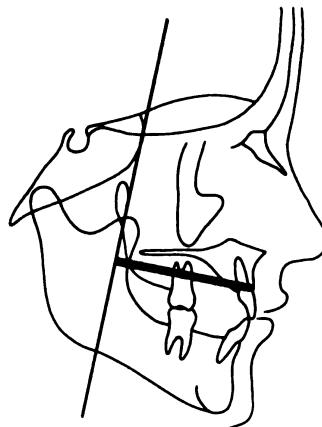
Upper Incisor Incisal Edge  
perpendicular to PM Vertical

UIE↓SE-PTM 7136-43

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	52.6	2.8	6	25	51.4	3.5
7	44	53.8	3.5	7	31	53.3	3.6
8	44	56.0	4.3	8	36	55.8	3.9
9	47	58.6	4.2	9	31	57.2	3.5
10	46	59.6	3.2	10	35	59.4	3.8
11	43	61.3	3.4	11	30	60.3	4.0
12	44	61.7	4.5	12	27	61.2	4.3
13	43	63.0	3.7	13	29	61.7	4.2
14	40	62.7	4.3	14	25	62.7	4.5
15	33	64.0	5.5	15	19	63.9	5.6
16	23	66.8	3.8	16	9	64.4	6.8



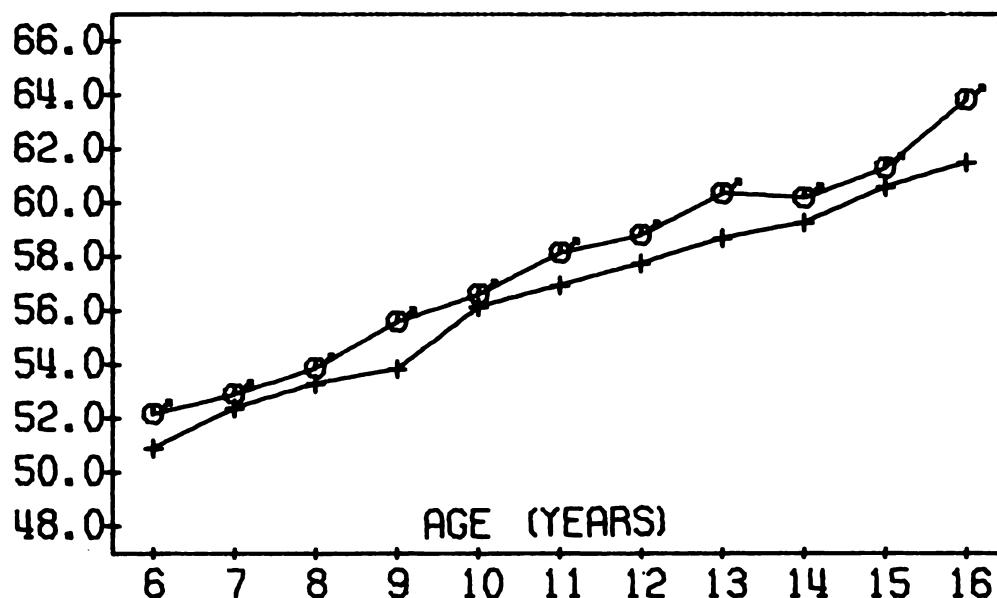
LINEAR MEASUREMENT  
Variable 125



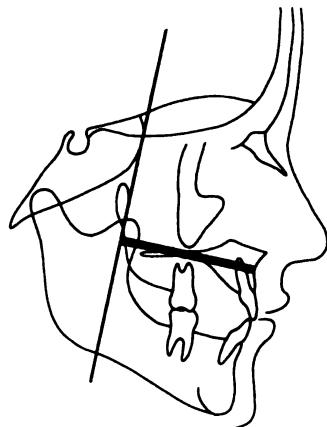
Supradentale perpendicular to  
PM Vertical

SD<sub>LSE</sub>-PTM      8<sub>L</sub>36-43

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	52.2	2.1	*	6	25	50.9	2.5
7	44	52.9	2.8		7	31	52.4	2.8
8	44	53.9	3.3		8	36	53.3	2.9
9	47	55.6	3.1	**	9	31	53.8	3.1
10	46	56.6	2.5		10	35	56.1	3.3
11	43	58.2	2.7		11	30	56.9	3.3
12	44	58.8	3.6		12	27	57.7	3.3
13	43	60.4	2.9	*	13	29	58.7	3.6
14	40	60.2	3.4		14	25	59.3	3.5
15	33	61.3	4.3		15	19	60.6	4.2
16	23	63.8	3.3		16	9	61.5	5.3



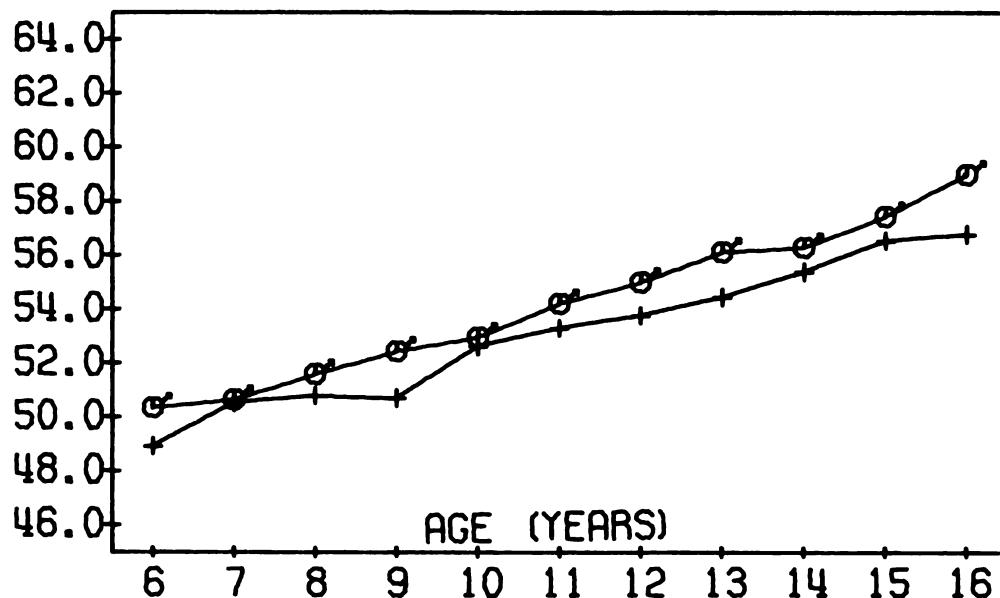
LINEAR MEASUREMENT  
Variable 126



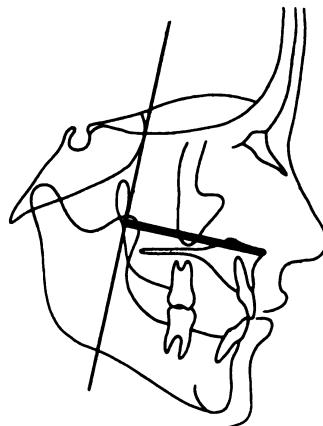
A Point perpendicular to PM  
Vertical

A\_LSE-PTM      9136-43

Age	N	Male			Age	N	Female		
		Mean mm	S.D. mm	**			Mean mm	S.D. mm	
6	37	50.4	2.0		6	25	48.9	2.1	
7	44	50.7	2.7		7	31	50.5	2.6	
8	44	51.6	2.7		8	36	50.8	2.6	
9	47	52.5	2.8	**	9	31	50.7	2.7	
10	46	53.0	2.1		10	35	52.6	3.1	
11	43	54.2	2.2		11	30	53.3	3.0	
12	44	55.0	3.4		12	27	53.8	3.1	
13	43	56.1	2.5	**	13	29	54.5	3.5	
14	40	56.3	3.3		14	25	55.4	3.2	
15	33	57.4	3.4		15	19	56.5	3.6	
16	23	59.0	3.1		16	9	56.8	4.5	



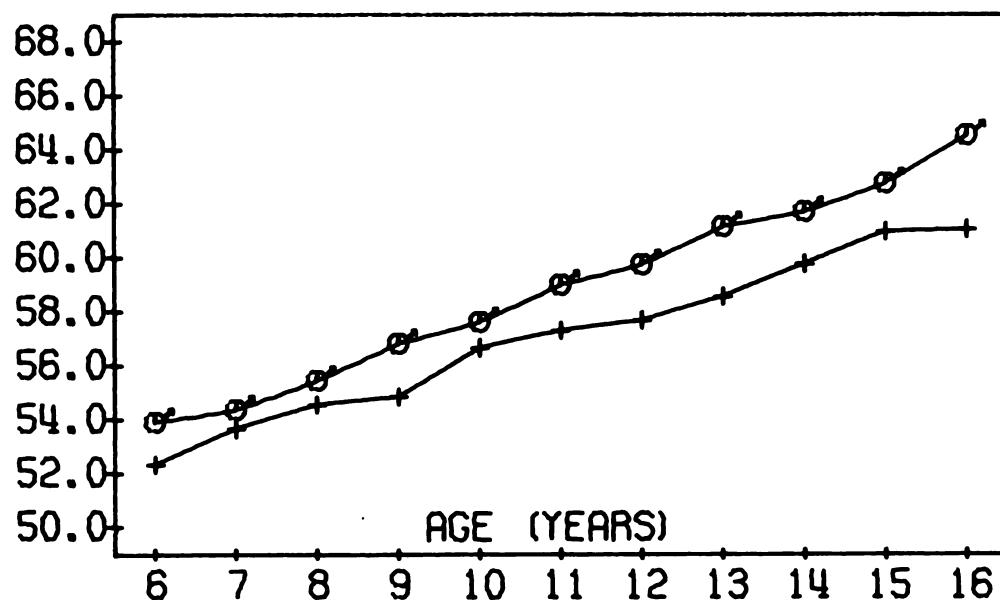
LINEAR MEASUREMENT  
Variable 127



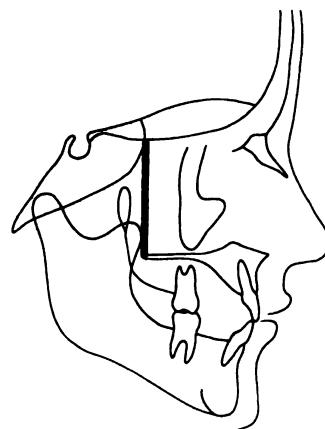
Anterior Nasal Spine perpendicular to PM Vertical

ANS-SE-PTM 10-36-43

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	53.9	2.3	**	6	25	52.3	2.1
7	44	54.4	2.5		7	31	53.7	2.6
8	44	55.5	2.8		8	36	54.6	2.7
9	47	56.8	2.9	**	9	31	54.8	2.7
10	46	57.6	2.3		10	35	56.6	3.1
11	43	59.0	2.5	**	11	30	57.3	3.3
12	44	59.8	3.2	**	12	27	57.7	3.1
13	43	61.2	2.8	**	13	29	58.6	3.4
14	40	61.7	3.4	*	14	25	59.8	3.4
15	33	62.8	3.0		15	19	61.0	3.6
16	23	64.5	3.2	*	16	9	61.0	4.8



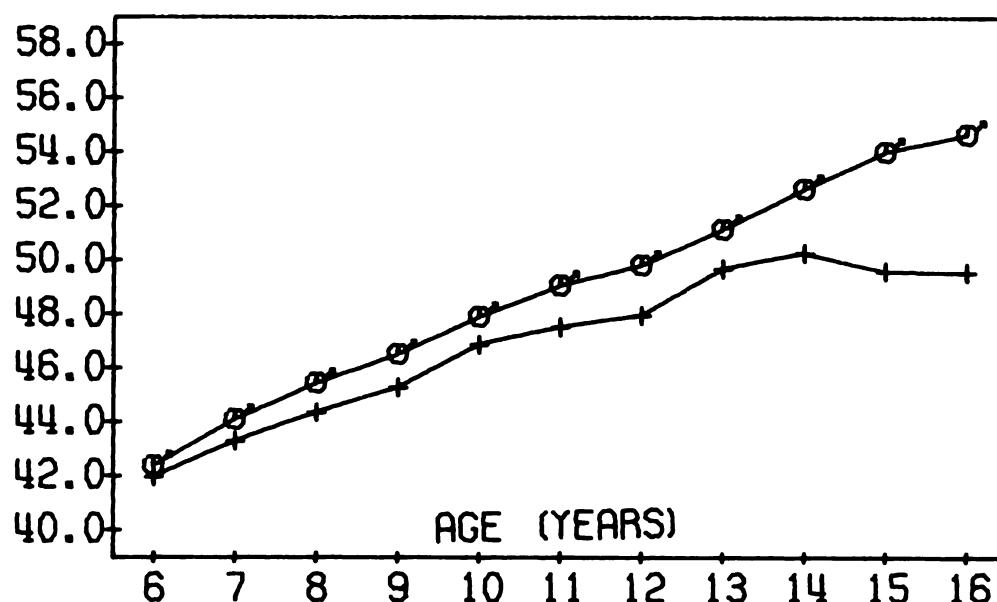
LINEAR MEASUREMENT  
Variable 128



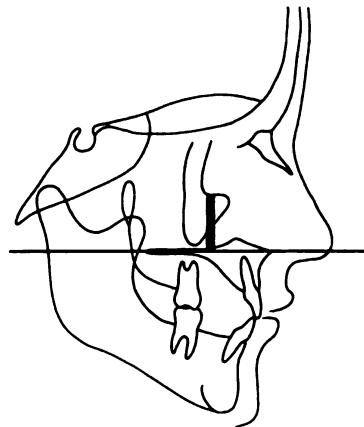
Ethmoid Registration Point-  
Posterior Nasal Spine

SE-PNS              36-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	42.4	2.8	6	24	42.0	2.6
7	44	44.1	2.9	7	31	43.3	2.8
8	44	45.5	2.9	8	36	44.4	2.8
9	47	46.5	2.7	9	31	45.3	3.0
10	46	47.9	3.0	10	35	46.9	3.4
11	43	49.1	3.4	11	30	47.5	3.3
12	44	49.8	3.7	12	27	48.0	3.0
13	43	51.2	3.5	13	29	49.7	2.6
14	39	52.7	3.5	14	25	50.3	2.4
15	33	54.0	3.8	15	19	49.6	2.8
16	23	54.7	4.4	16	9	49.6	3.3



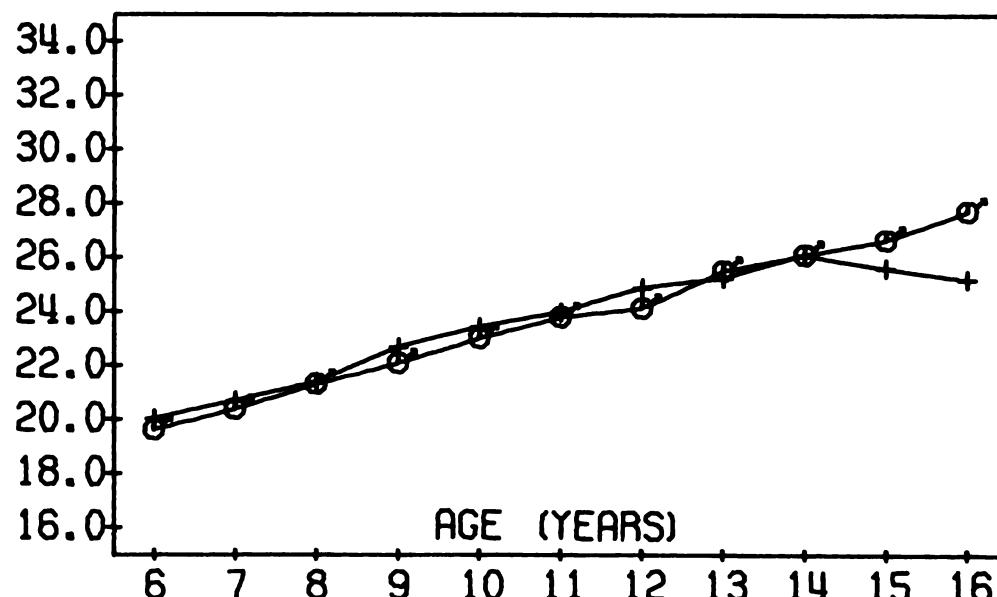
LINEAR MEASUREMENT  
Variable 129



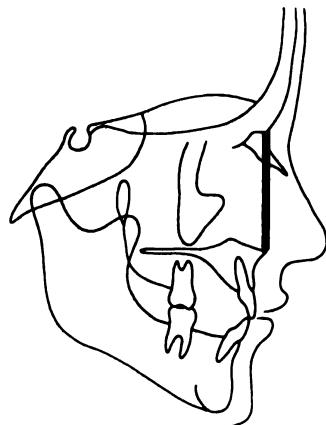
Orbitale perpendicular to  
Palatal Plane

OR<sub>L</sub>PNS-ANS      40<sub>L</sub>45-10

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	19.6	2.0	6	24	20.0	2.2
7	44	20.4	2.6	7	31	20.7	1.9
8	44	21.3	2.3	8	36	21.4	2.4
9	47	22.1	2.5	9	31	22.7	2.1
10	46	23.0	2.4	10	35	23.4	2.1
11	43	23.8	2.7	11	30	24.0	2.3
12	44	24.1	2.4	12	27	24.9	2.4
13	42	25.5	2.6	13	29	25.2	2.0
14	39	26.1	3.1	14	25	26.1	2.5
15	33	26.7	3.0	15	19	25.6	2.0
16	23	27.7	2.8	*	16	9	25.2



LINEAR MEASUREMENT  
Variable 130

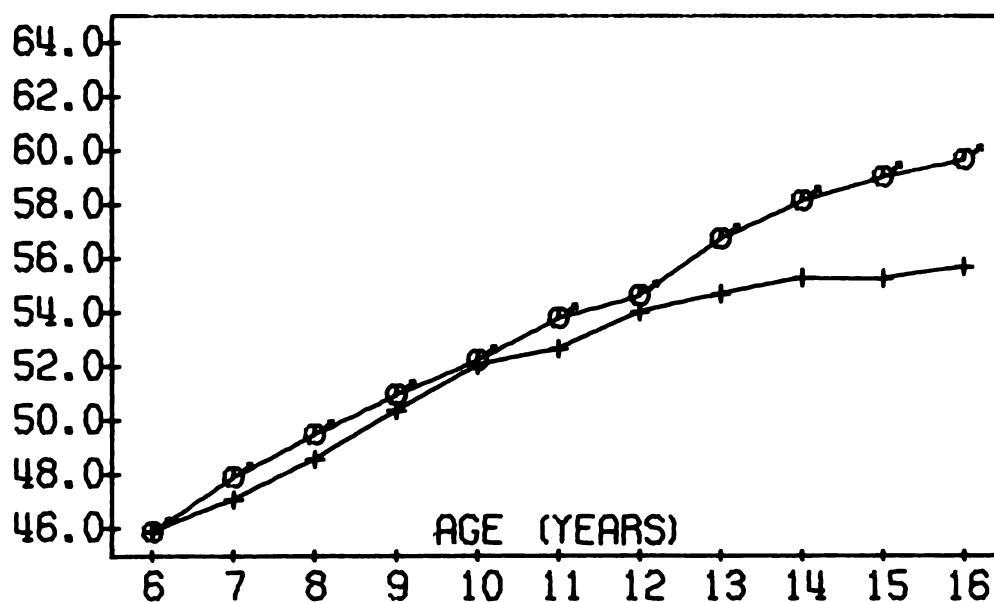


Anterior Nasal Spine-Nasion

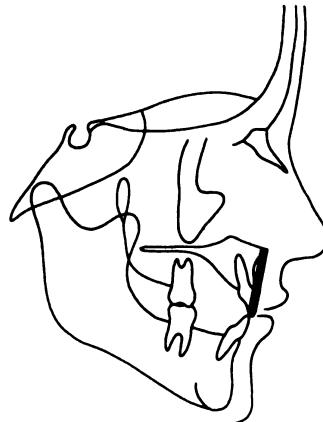
ANS-N

10-38

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	45.9	2.8	6	25	45.9	3.1
7	44	47.9	3.2	7	31	47.1	2.9
8	44	49.5	2.8	8	36	48.6	3.0
9	47	51.0	3.0	9	31	50.4	3.1
10	46	52.3	3.1	10	35	52.1	3.7
11	43	53.8	3.4	11	30	52.7	3.3
12	44	54.6	3.6	12	27	54.0	3.7
13	43	56.8	3.7	13	29	54.7	3.3
14	40	58.2	4.1	14	25	55.3	2.7
15	33	59.0	4.0	15	19	55.3	3.2
16	23	59.7	3.9	16	9	55.7	2.1



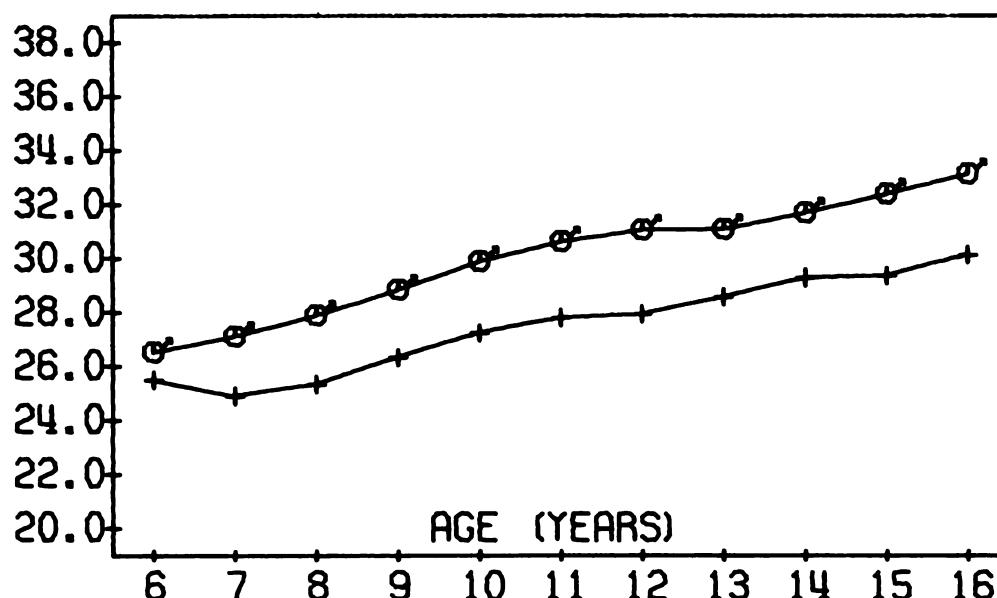
LINEAR MEASUREMENT  
Variable 131



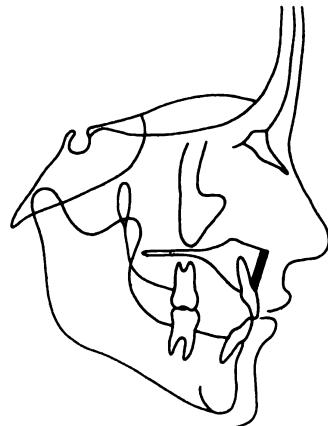
Anterior Nasal Spine-Upper  
Incisor Incisal Edge

ANS-UIE      10-7

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	26.6	2.3	6	25	25.5	2.4
7	44	27.1	2.4	7	31	24.9	3.3
8	44	27.9	2.2	8	36	25.3	2.8
9	47	28.9	2.4	9	31	26.3	2.7
10	46	29.9	2.2	10	35	27.2	2.8
11	43	30.7	2.0	11	30	27.8	2.8
12	44	31.1	2.2	12	27	27.9	2.7
13	43	31.1	2.4	13	29	28.6	2.7
14	40	31.7	2.3	14	25	29.3	3.0
15	33	32.4	2.8	15	19	29.4	3.2
16	23	33.2	3.2	16	9	30.1	2.8



LINEAR MEASUREMENT  
Variable 132

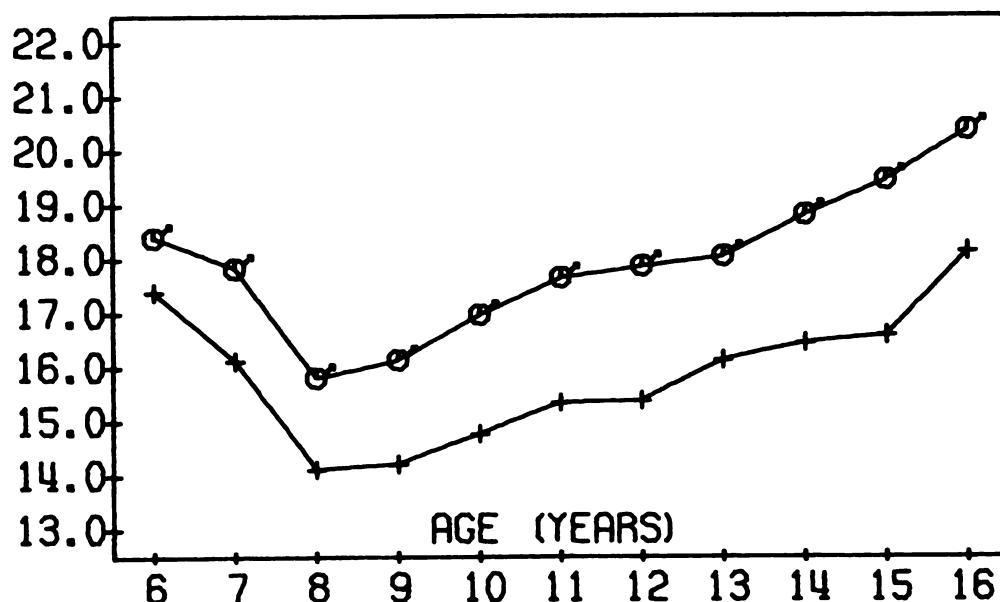


Anterior Nasal Spine-Supra-dentale

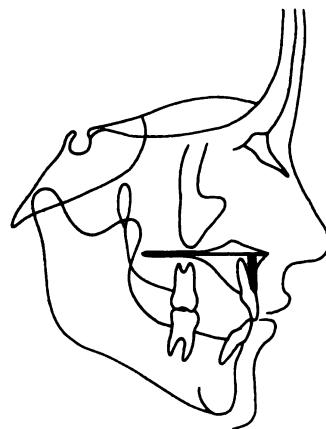
ANS-SD

10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	7	31	16.1	3.5
8	44	15.8	2.1	8	36	14.1	2.5
9	47	16.2	2.0	9	31	14.2	2.4
10	46	17.0	2.1	10	35	14.8	2.3
11	43	17.7	1.7	11	30	15.4	2.5
12	44	17.9	2.0	12	27	15.4	2.3
13	43	18.1	2.1	13	29	16.1	2.1
14	40	18.8	2.1	14	25	16.4	2.4
15	33	19.5	2.8	15	19	16.6	2.6
16	23	20.4	2.9	16	9	18.1	2.7



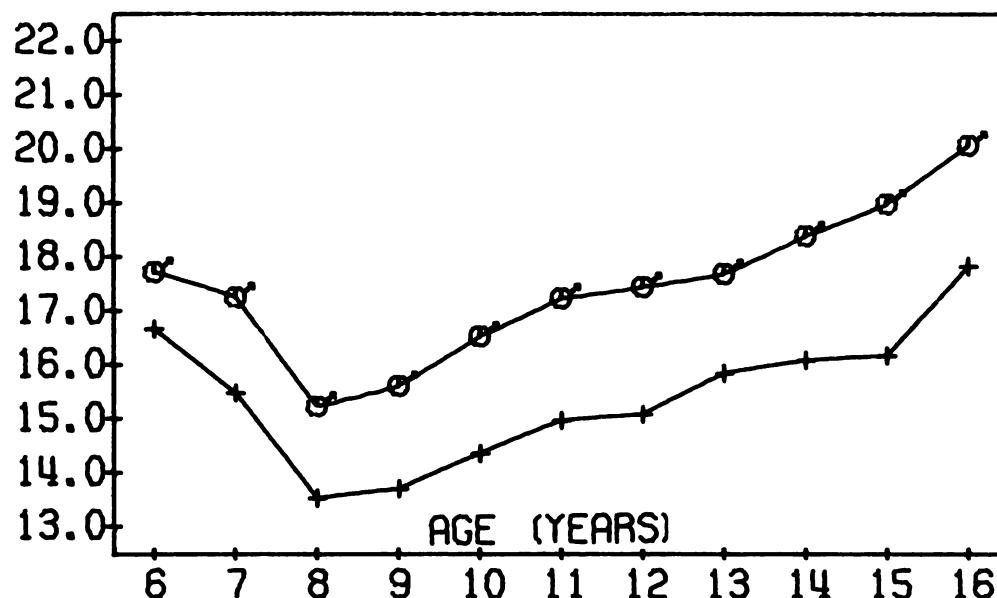
LINEAR MEASUREMENT  
Variable 133



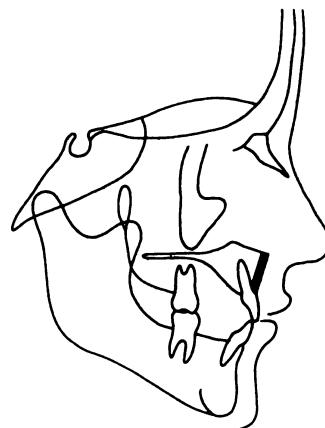
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



LINEAR MEASUREMENT  
Variable 132

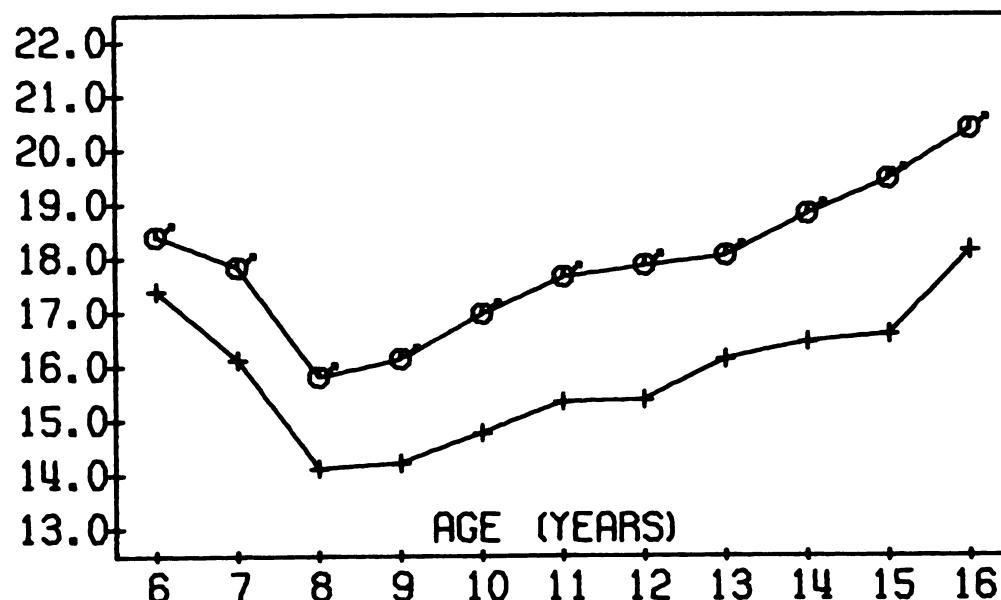


Anterior Nasal Spine-Supra-  
dentale

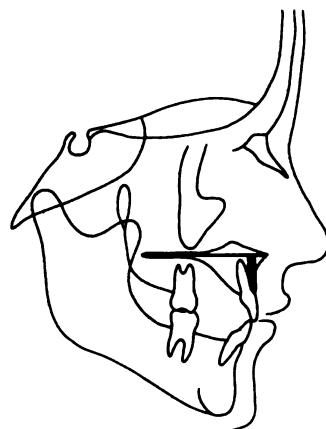
ANS-SD

10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	7	31	16.1	3.5
8	44	15.8	2.1	8	36	14.1	2.5
9	47	16.2	2.0	9	31	14.2	2.4
10	46	17.0	2.1	10	35	14.8	2.3
11	43	17.7	1.7	11	30	15.4	2.5
12	44	17.9	2.0	12	27	15.4	2.3
13	43	18.1	2.1	13	29	16.1	2.1
14	40	18.8	2.1	14	25	16.4	2.4
15	33	19.5	2.8	15	19	16.6	2.6
16	23	20.4	2.9	16	9	18.1	2.7



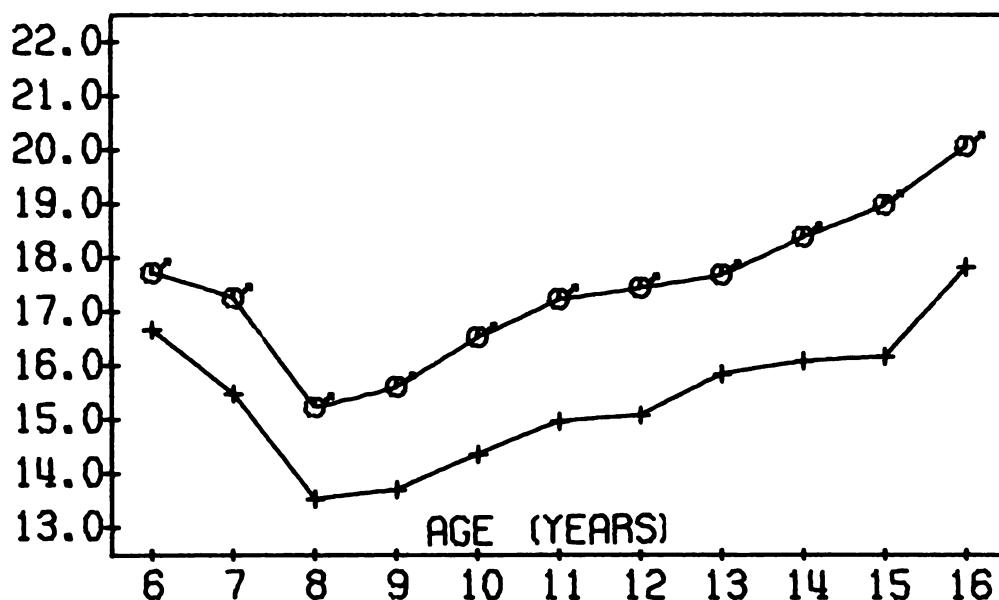
LINEAR MEASUREMENT  
Variable 133



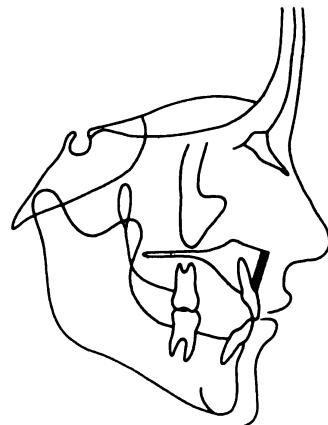
Supradentale perpendicular to  
Palatal Plane

SD<sub>L</sub>ANS-PNS      8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



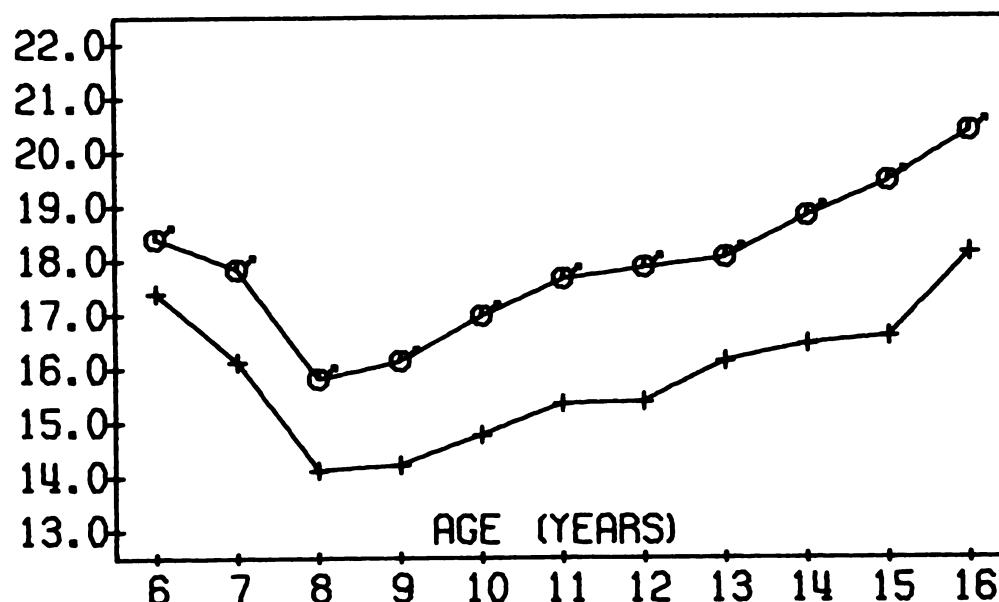
LINEAR MEASUREMENT  
Variable 132



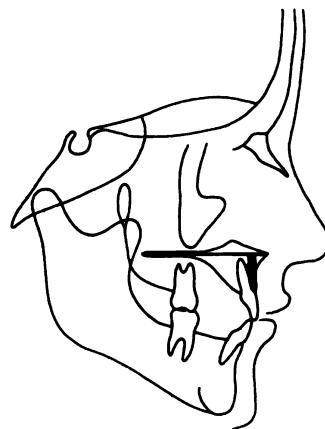
Anterior Nasal Spine-Supra-dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	7	31	16.1	3.5
8	44	15.8	2.1	8	36	14.1	2.5
9	47	16.2	2.0	9	31	14.2	2.4
10	46	17.0	2.1	10	35	14.8	2.3
11	43	17.7	1.7	11	30	15.4	2.5
12	44	17.9	2.0	12	27	15.4	2.3
13	43	18.1	2.1	13	29	16.1	2.1
14	40	18.8	2.1	14	25	16.4	2.4
15	33	19.5	2.8	15	19	16.6	2.6
16	23	20.4	2.9	16	9	18.1	2.7



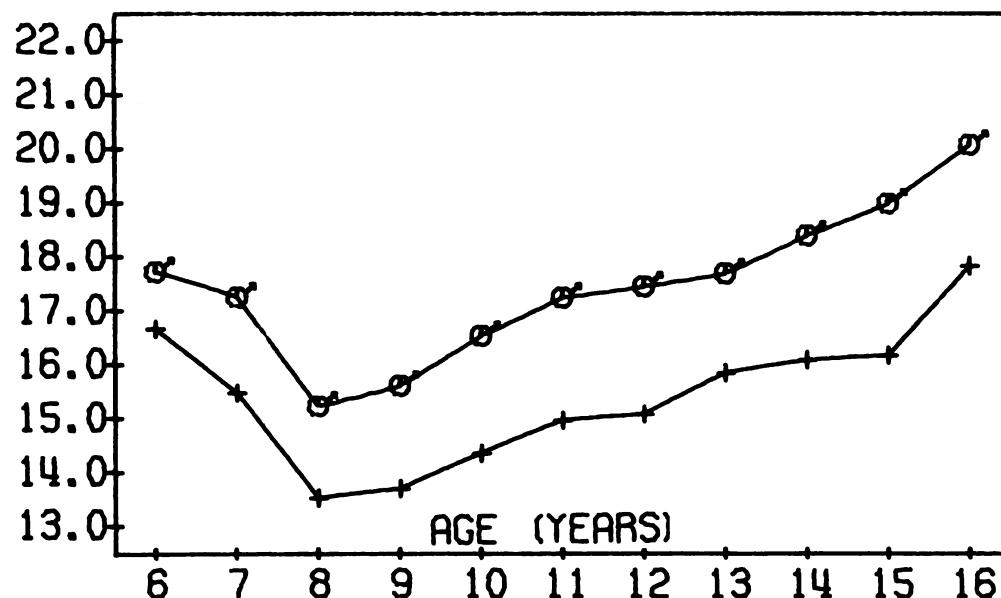
LINEAR MEASUREMENT  
Variable 133



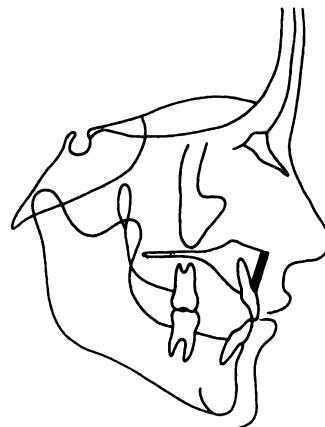
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



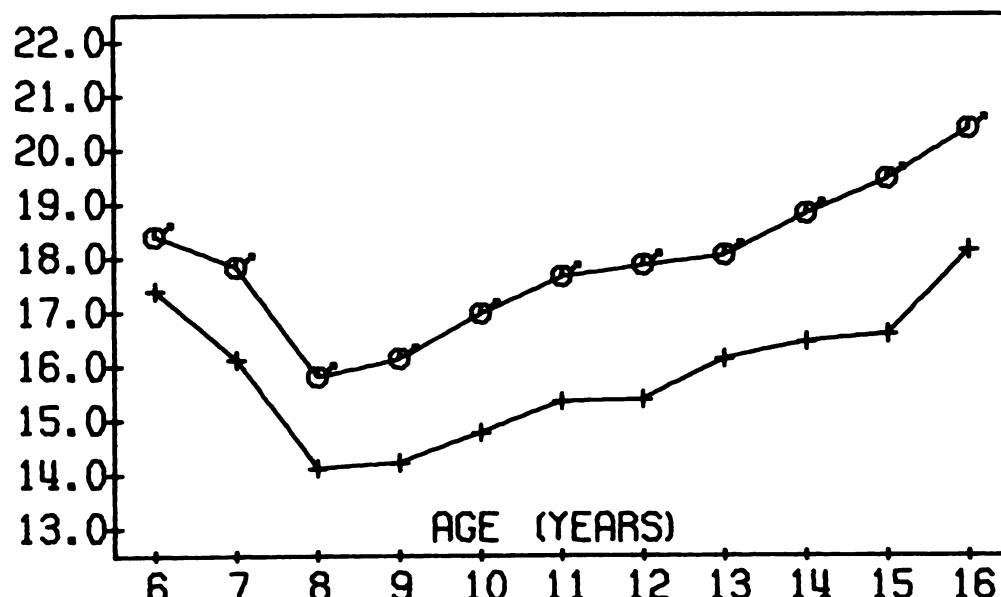
LINEAR MEASUREMENT  
Variable 132



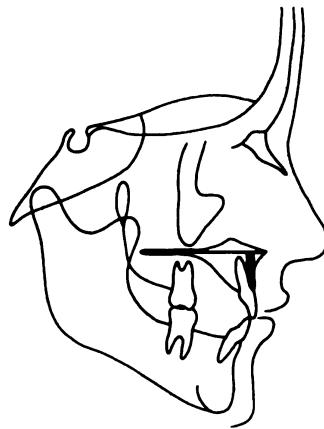
Anterior Nasal Spine-Supra-dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	7	31	16.1	3.5
8	44	15.8	2.1	8	36	14.1	2.5
9	47	16.2	2.0	9	31	14.2	2.4
10	46	17.0	2.1	10	35	14.8	2.3
11	43	17.7	1.7	11	30	15.4	2.5
12	44	17.9	2.0	12	27	15.4	2.3
13	43	18.1	2.1	13	29	16.1	2.1
14	40	18.8	2.1	14	25	16.4	2.4
15	33	19.5	2.8	15	19	16.6	2.6
16	23	20.4	2.9	16	9	18.1	2.7



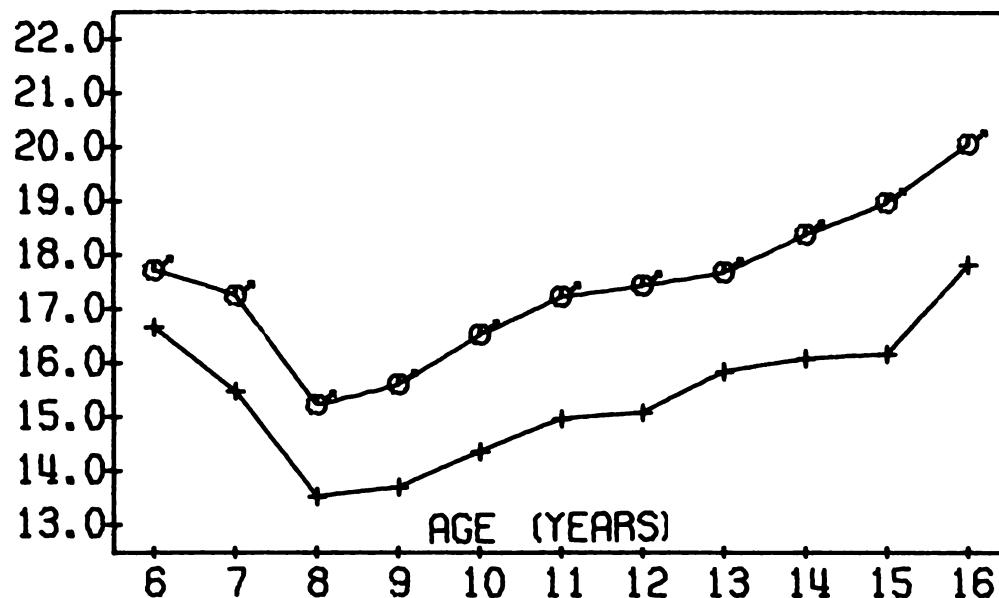
LINEAR MEASUREMENT  
Variable 133



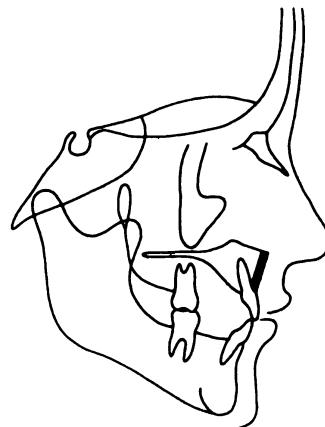
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



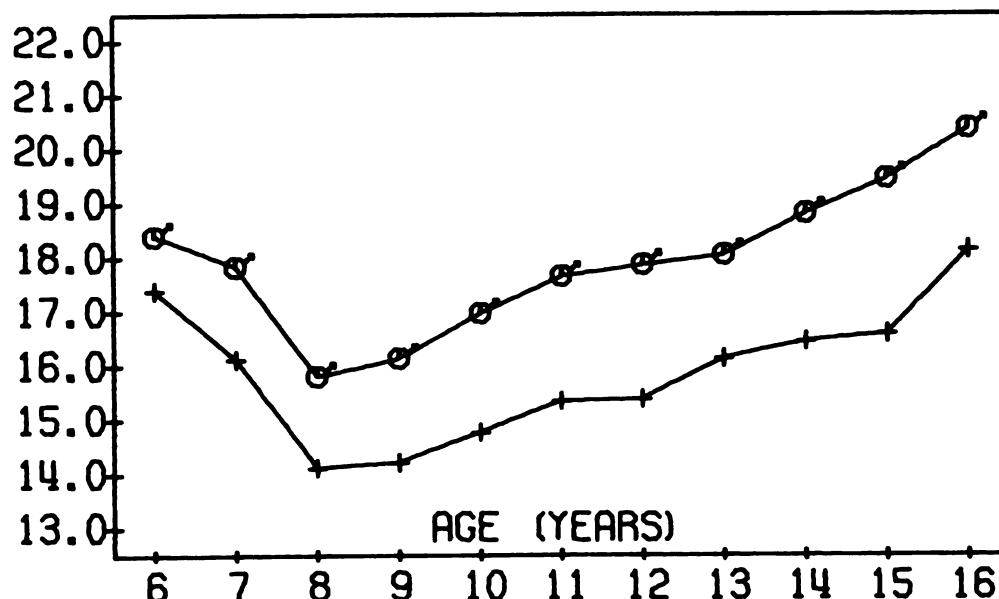
LINEAR MEASUREMENT  
Variable 132



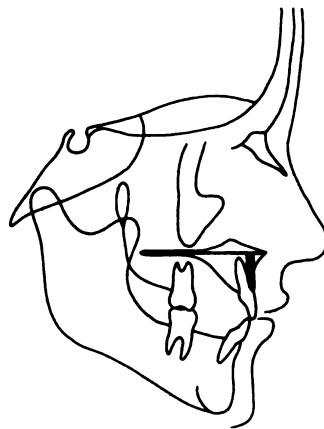
Anterior Nasal Spine-Supra-dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	*	7	31	16.1
8	44	15.8	2.1	**	8	36	14.1
9	47	16.2	2.0	**	9	31	14.2
10	46	17.0	2.1	**	10	35	14.8
11	43	17.7	1.7	**	11	30	15.4
12	44	17.9	2.0	**	12	27	15.4
13	43	18.1	2.1	**	13	29	16.1
14	40	18.8	2.1	**	14	25	16.4
15	33	19.5	2.8	**	15	19	16.6
16	23	20.4	2.9		16	9	18.1



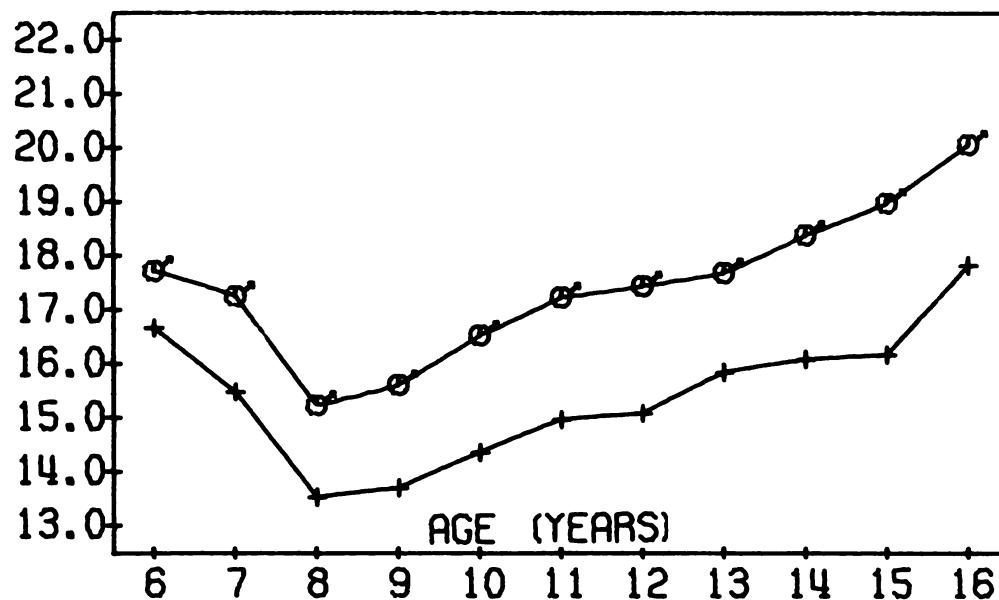
LINEAR MEASUREMENT  
Variable 133



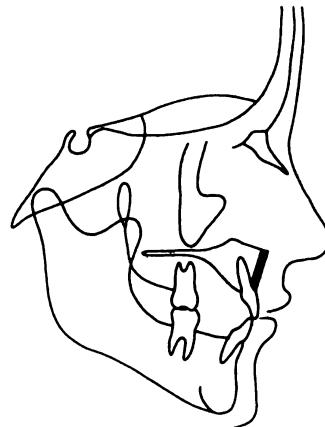
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



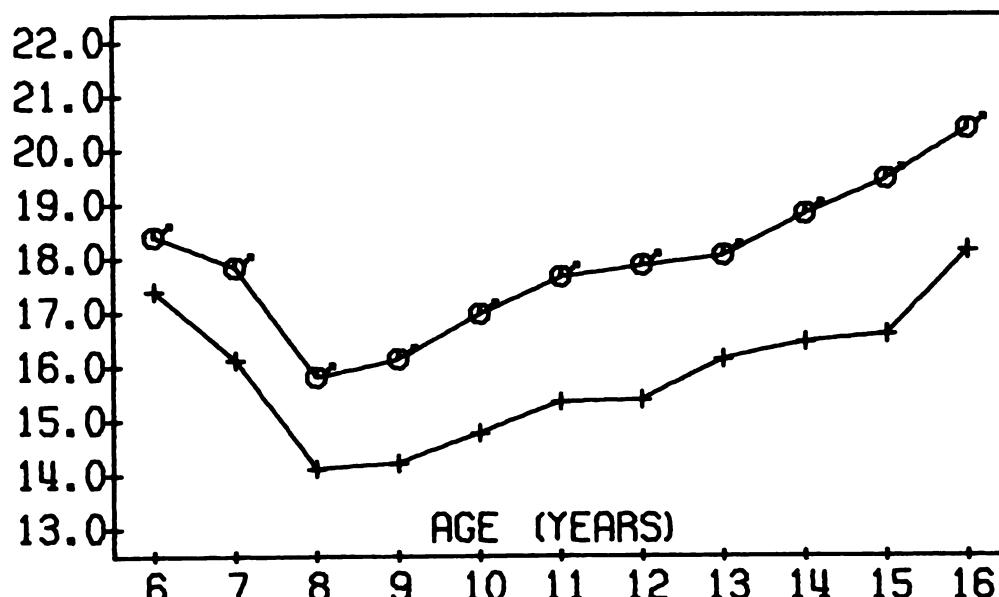
LINEAR MEASUREMENT  
Variable 132



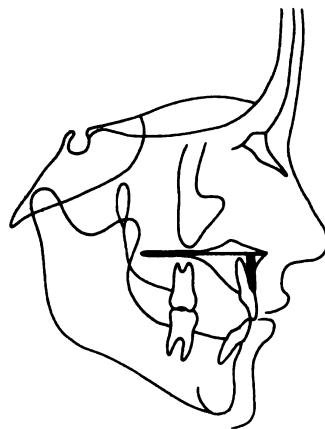
Anterior Nasal Spine-Supra-dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	7	31	16.1	3.5
8	44	15.8	2.1	8	36	14.1	2.5
9	47	16.2	2.0	9	31	14.2	2.4
10	46	17.0	2.1	10	35	14.8	2.3
11	43	17.7	1.7	11	30	15.4	2.5
12	44	17.9	2.0	12	27	15.4	2.3
13	43	18.1	2.1	13	29	16.1	2.1
14	40	18.8	2.1	14	25	16.4	2.4
15	33	19.5	2.8	15	19	16.6	2.6
16	23	20.4	2.9	16	9	18.1	2.7



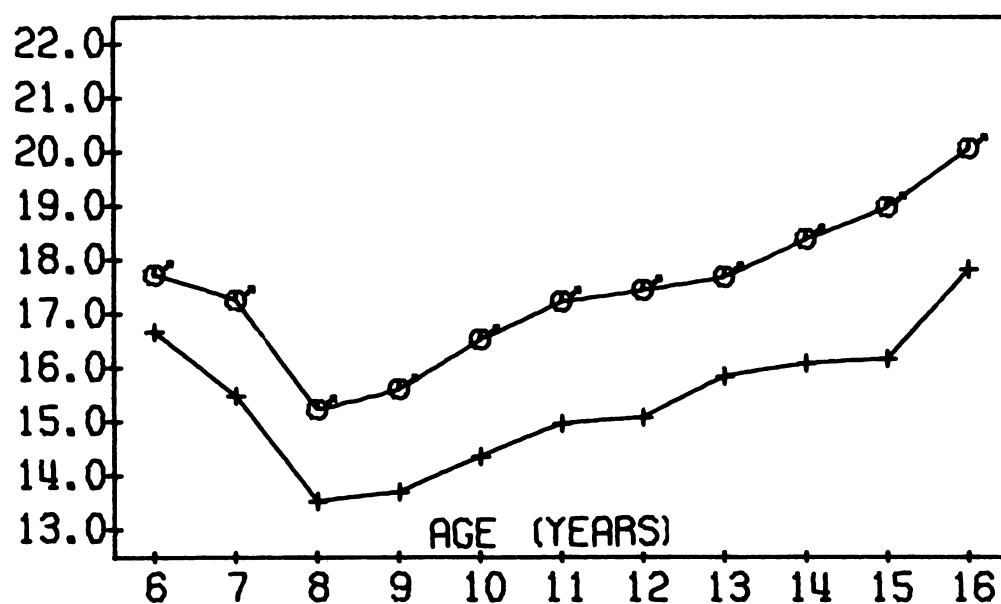
LINEAR MEASUREMENT  
Variable 133



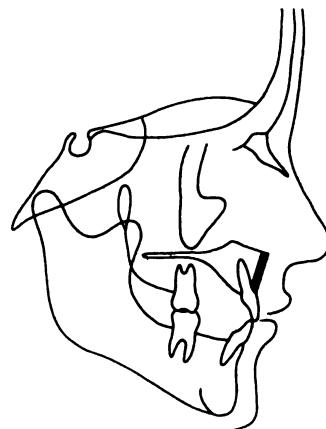
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



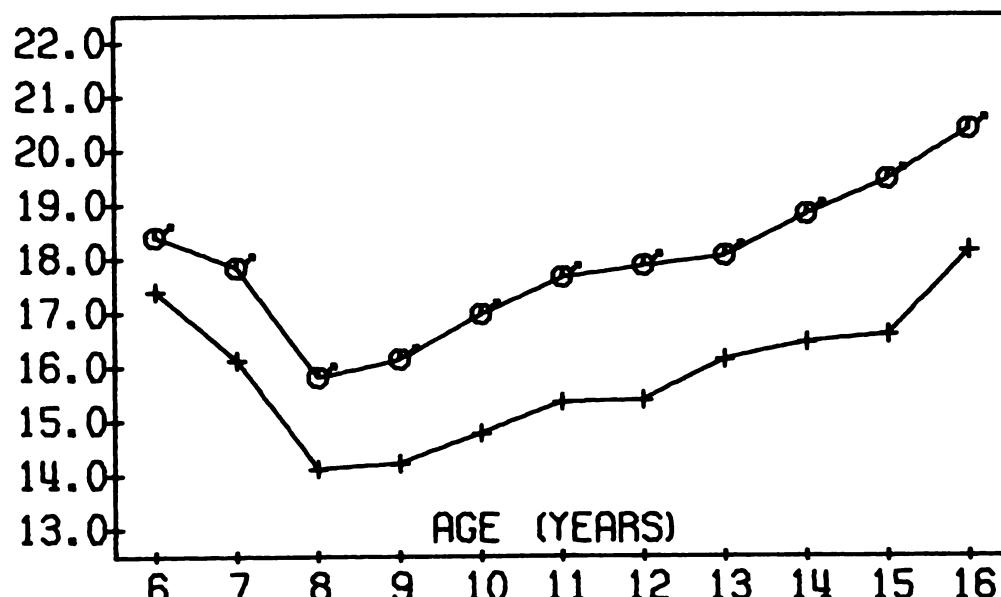
LINEAR MEASUREMENT  
Variable 132



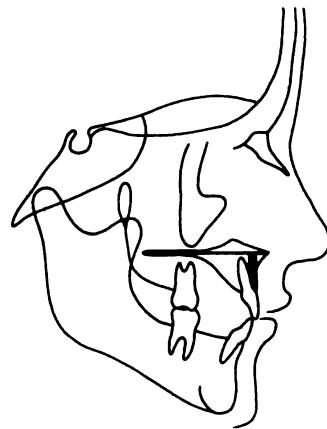
Anterior Nasal Spine-Supra-dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	*	7	31	16.1
8	44	15.8	2.1	**	8	36	14.1
9	47	16.2	2.0	**	9	31	14.2
10	46	17.0	2.1	**	10	35	14.8
11	43	17.7	1.7	**	11	30	15.4
12	44	17.9	2.0	**	12	27	15.4
13	43	18.1	2.1	**	13	29	16.1
14	40	18.8	2.1	**	14	25	16.4
15	33	19.5	2.8	**	15	19	16.6
16	23	20.4	2.9		16	9	18.1



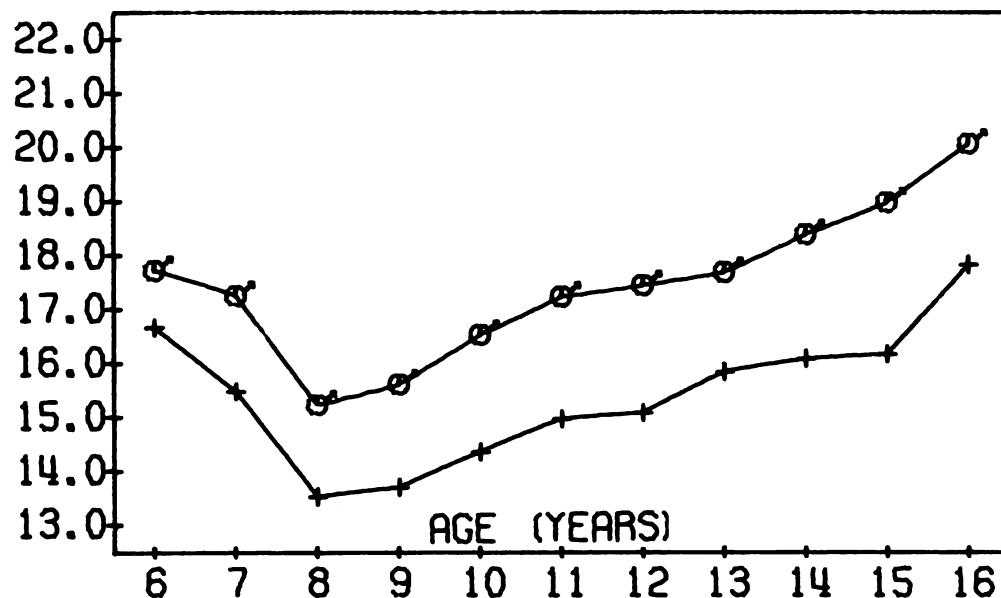
LINEAR MEASUREMENT  
Variable 133



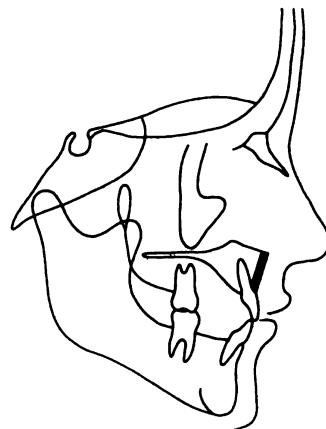
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



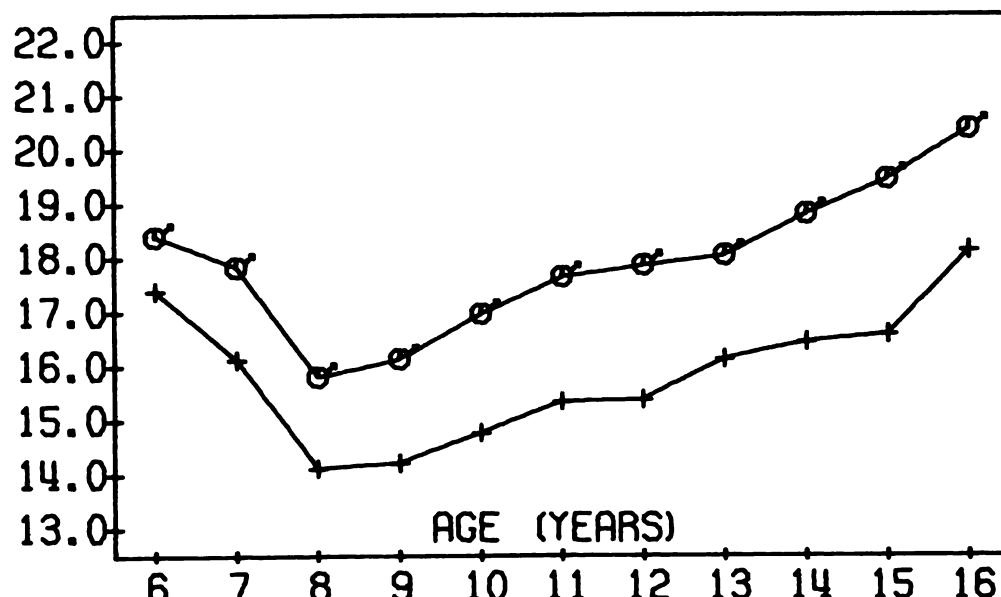
LINEAR MEASUREMENT  
Variable 132



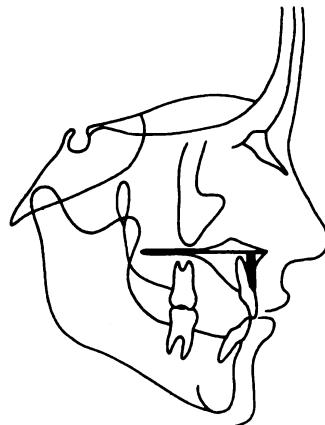
Anterior Nasal Spine-Supra-dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	7	31	16.1	3.5
8	44	15.8	2.1	8	36	14.1	2.5
9	47	16.2	2.0	9	31	14.2	2.4
10	46	17.0	2.1	10	35	14.8	2.3
11	43	17.7	1.7	11	30	15.4	2.5
12	44	17.9	2.0	12	27	15.4	2.3
13	43	18.1	2.1	13	29	16.1	2.1
14	40	18.8	2.1	14	25	16.4	2.4
15	33	19.5	2.8	15	19	16.6	2.6
16	23	20.4	2.9	16	9	18.1	2.7



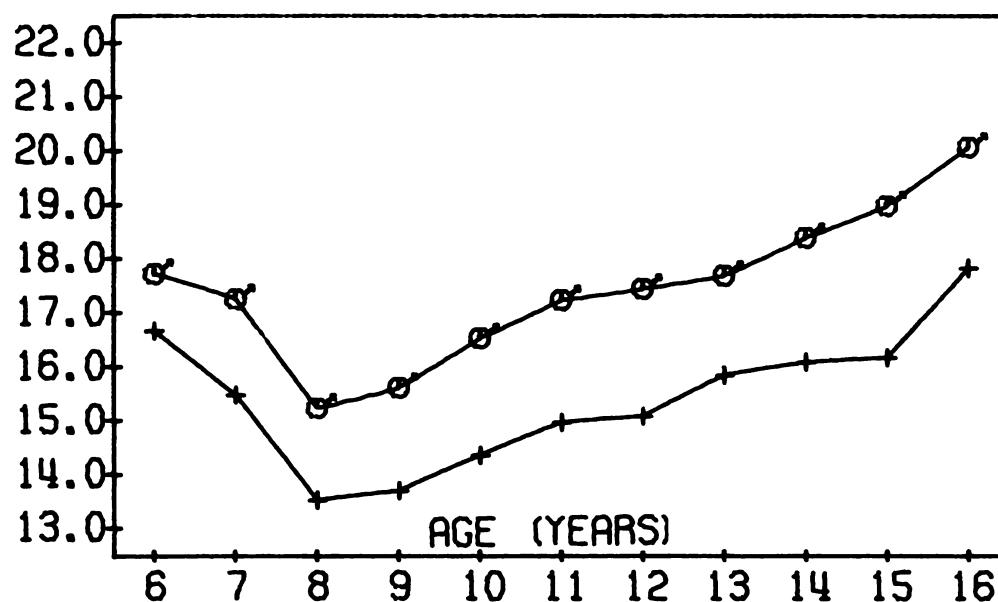
LINEAR MEASUREMENT  
Variable 133



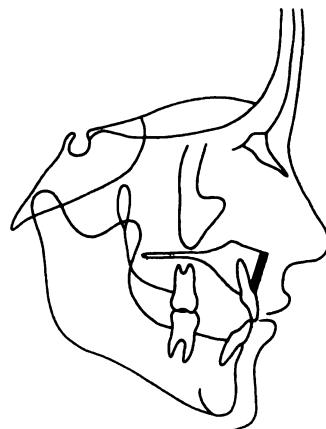
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	17.7	2.3		6	24	16.7	2.7
7	44	17.3	2.8	**	7	31	15.5	3.6
8	44	15.2	2.2	**	8	36	13.5	2.6
9	47	15.6	2.1	**	9	31	13.7	2.4
10	46	16.5	2.1	**	10	35	14.4	2.3
11	43	17.2	1.7	**	11	30	15.0	2.5
12	44	17.4	2.0	**	12	27	15.1	2.3
13	43	17.7	2.1	**	13	29	15.8	2.1
14	39	18.4	2.2	**	14	25	16.1	2.3
15	33	19.0	2.8	**	15	19	16.2	2.7
16	23	20.1	2.8		16	9	17.8	2.8



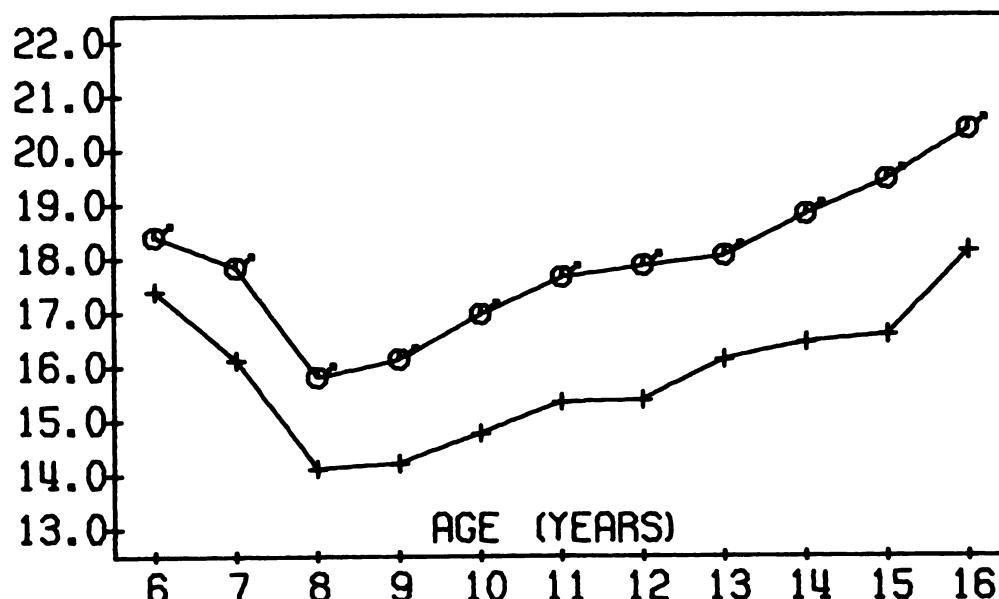
LINEAR MEASUREMENT  
Variable 132



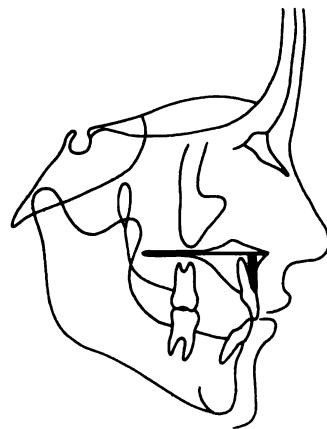
Anterior Nasal Spine-Supra-dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	7	31	16.1	3.5
8	44	15.8	2.1	*	8	36	14.1
9	47	16.2	2.0	**	9	31	14.2
10	46	17.0	2.1	**	10	35	14.8
11	43	17.7	1.7	**	11	30	15.4
12	44	17.9	2.0	**	12	27	15.4
13	43	18.1	2.1	**	13	29	16.1
14	40	18.8	2.1	**	14	25	16.4
15	33	19.5	2.8	**	15	19	16.6
16	23	20.4	2.9		16	9	18.1



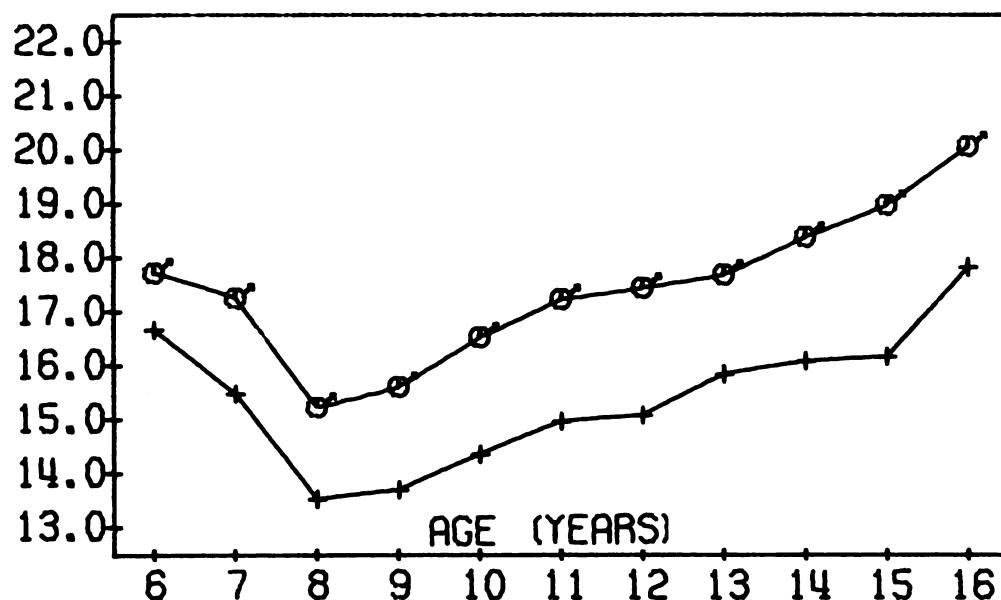
LINEAR MEASUREMENT  
Variable 133



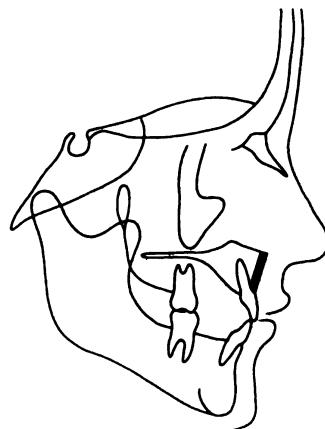
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



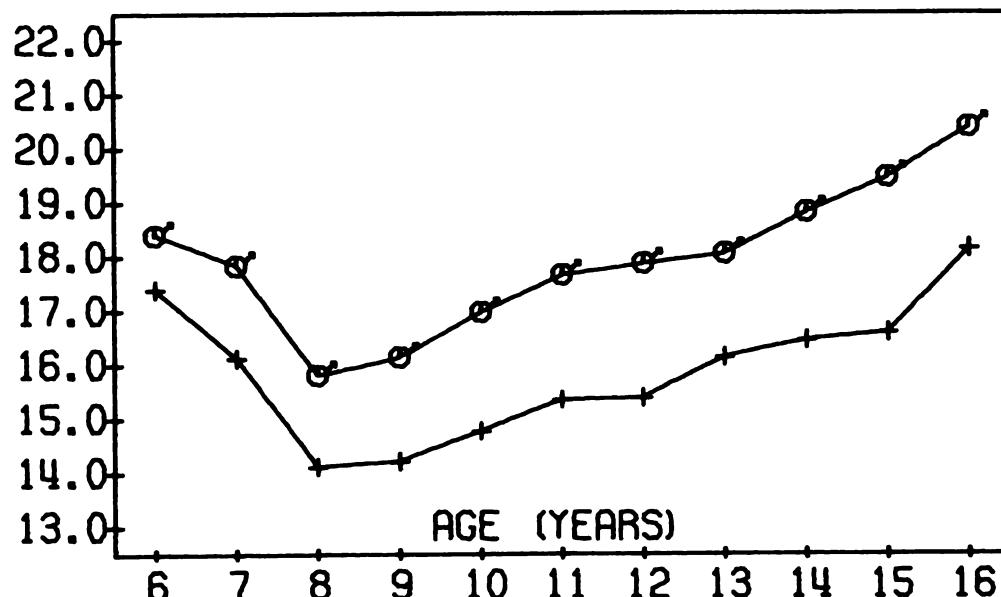
LINEAR MEASUREMENT  
Variable 132



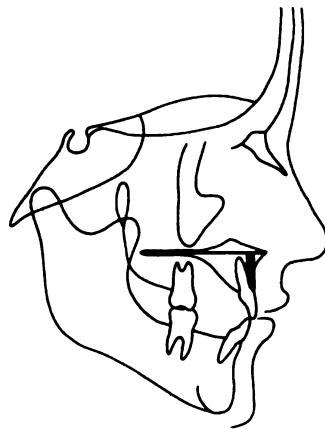
Anterior Nasal Spine-Supra-  
dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	*	7	31	16.1
8	44	15.8	2.1	**	8	36	14.1
9	47	16.2	2.0	**	9	31	14.2
10	46	17.0	2.1	**	10	35	14.8
11	43	17.7	1.7	**	11	30	15.4
12	44	17.9	2.0	**	12	27	15.4
13	43	18.1	2.1	**	13	29	16.1
14	40	18.8	2.1	**	14	25	16.4
15	33	19.5	2.8	**	15	19	16.6
16	23	20.4	2.9		16	9	18.1



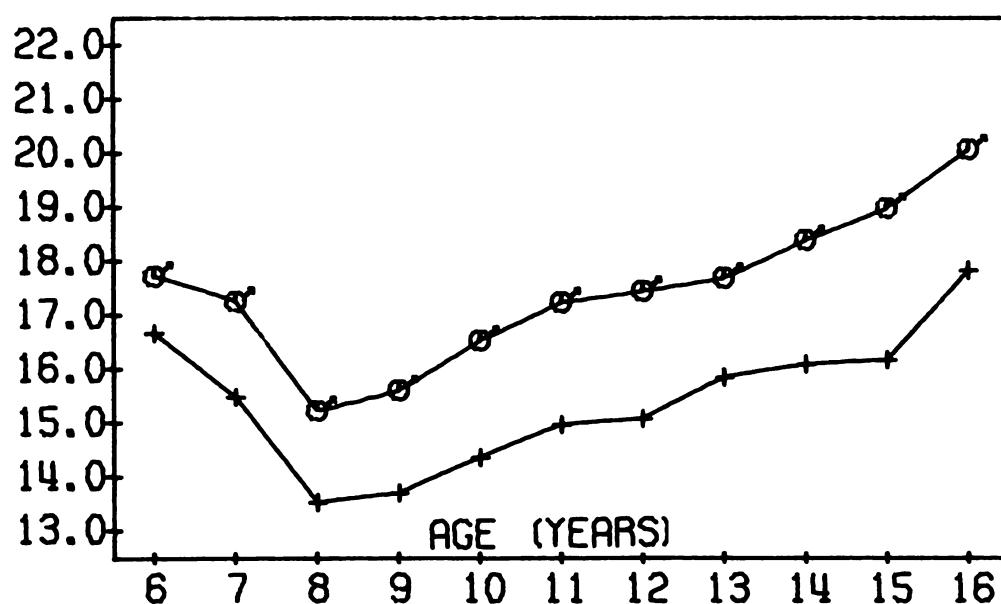
LINEAR MEASUREMENT  
Variable 133



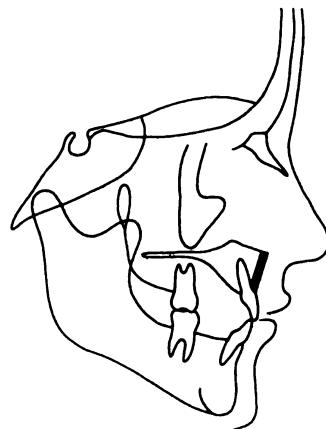
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



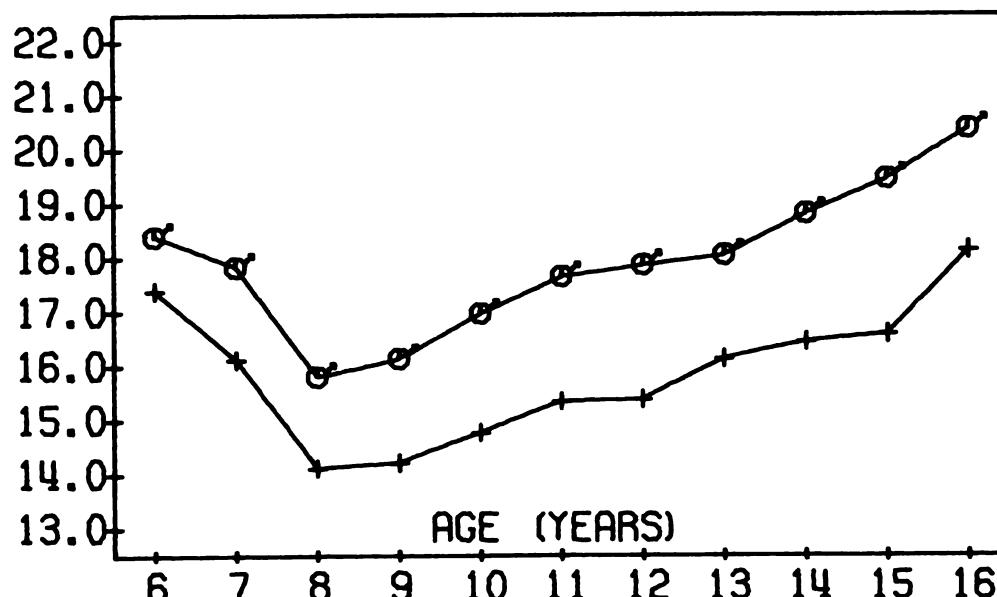
LINEAR MEASUREMENT  
Variable 132



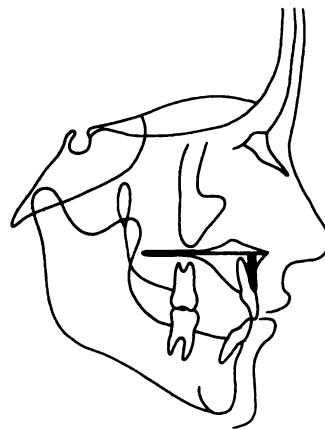
Anterior Nasal Spine-Supra-dentale

ANS-SD      10-8

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	18.4	2.2	6	25	17.4	2.9
7	44	17.8	2.8	7	31	16.1	3.5
8	44	15.8	2.1	8	36	14.1	2.5
9	47	16.2	2.0	9	31	14.2	2.4
10	46	17.0	2.1	10	35	14.8	2.3
11	43	17.7	1.7	11	30	15.4	2.5
12	44	17.9	2.0	12	27	15.4	2.3
13	43	18.1	2.1	13	29	16.1	2.1
14	40	18.8	2.1	14	25	16.4	2.4
15	33	19.5	2.8	15	19	16.6	2.6
16	23	20.4	2.9	16	9	18.1	2.7



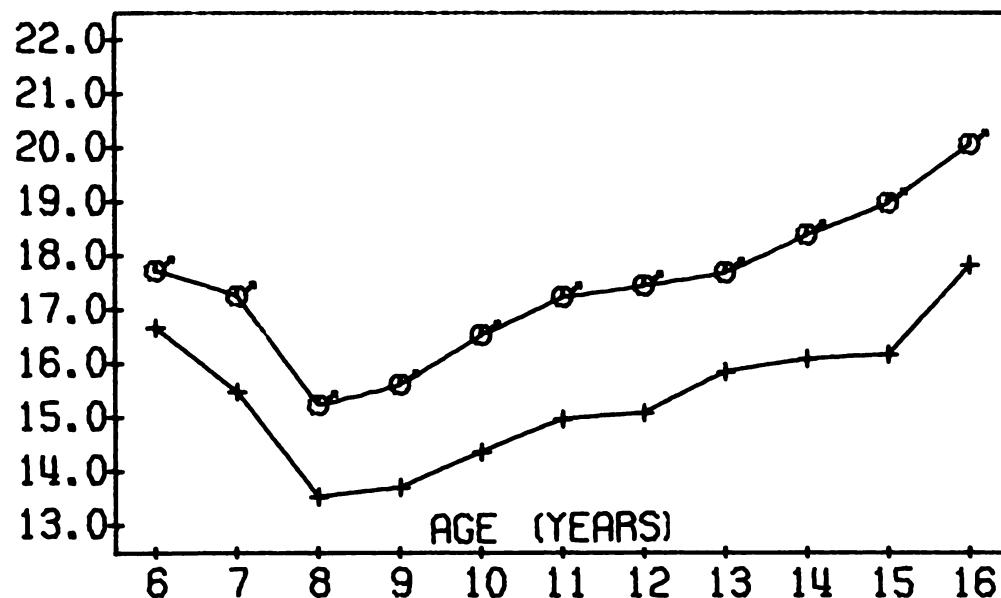
LINEAR MEASUREMENT  
Variable 133



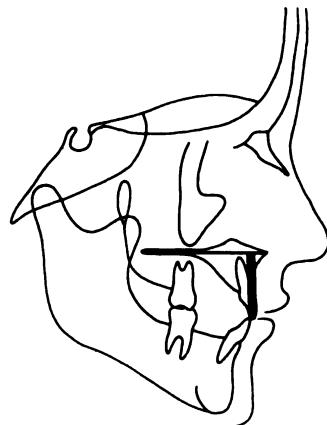
Supradentale perpendicular to  
Palatal Plane

SD<sub>LANS-PNS</sub> 8<sub>L</sub>10-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.7	2.3	6	24	16.7	2.7
7	44	17.3	2.8	7	31	15.5	3.6
8	44	15.2	2.2	8	36	13.5	2.6
9	47	15.6	2.1	9	31	13.7	2.4
10	46	16.5	2.1	10	35	14.4	2.3
11	43	17.2	1.7	11	30	15.0	2.5
12	44	17.4	2.0	12	27	15.1	2.3
13	43	17.7	2.1	13	29	15.8	2.1
14	39	18.4	2.2	14	25	16.1	2.3
15	33	19.0	2.8	15	19	16.2	2.7
16	23	20.1	2.8	16	9	17.8	2.8



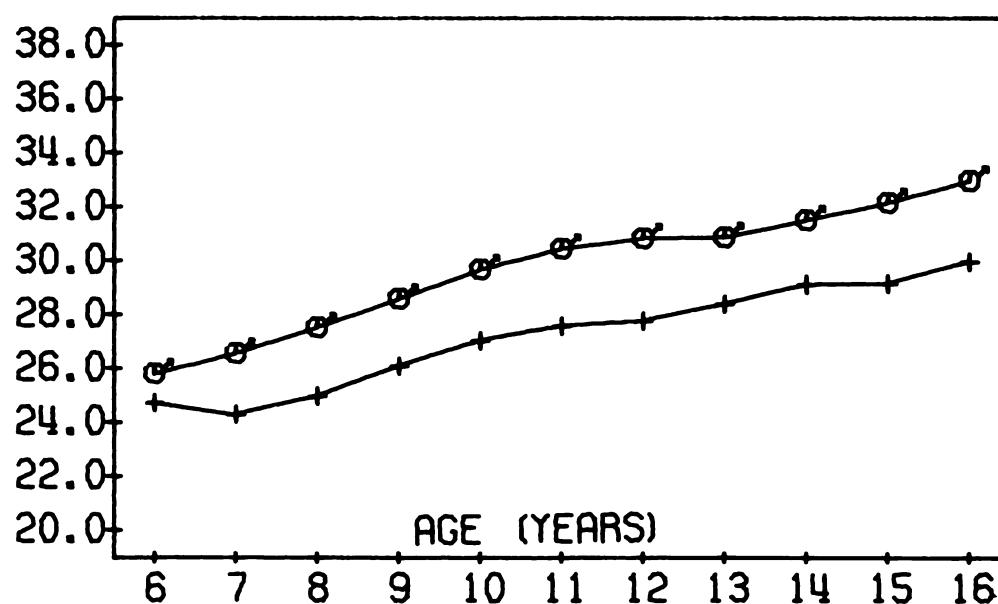
LINEAR MEASUREMENT  
Variable 134



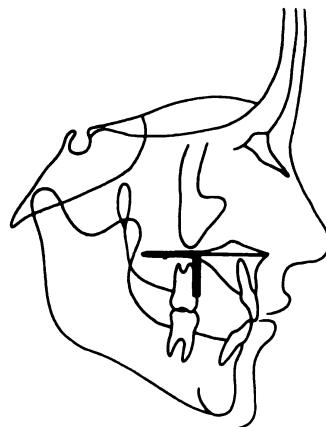
Upper Incisor Incisal Edge  
perpendicular to Palatal  
Plane

UI E<sub>L</sub>ANS-PNS 7<sub>L</sub>10-45

Age	N	Male Mean mm	S.D. mm	Age	N	Female Mean mm	S.D. mm
6	37	25.8	2.3	6	24	24.7	2.1
7	44	26.6	2.4	7	31	24.3	3.5
8	44	27.5	2.3	8	36	25.0	2.8
9	47	28.6	2.5	9	31	26.1	2.6
10	46	29.7	2.2	10	35	27.0	2.8
11	43	30.5	2.0	11	30	27.6	2.7
12	44	30.9	2.2	12	27	27.8	2.7
13	43	30.9	2.4	13	29	28.4	2.6
14	39	31.5	2.3	14	25	29.1	3.0
15	33	32.2	2.8	15	19	29.1	3.3
16	23	33.0	3.2	**	16	9	30.0



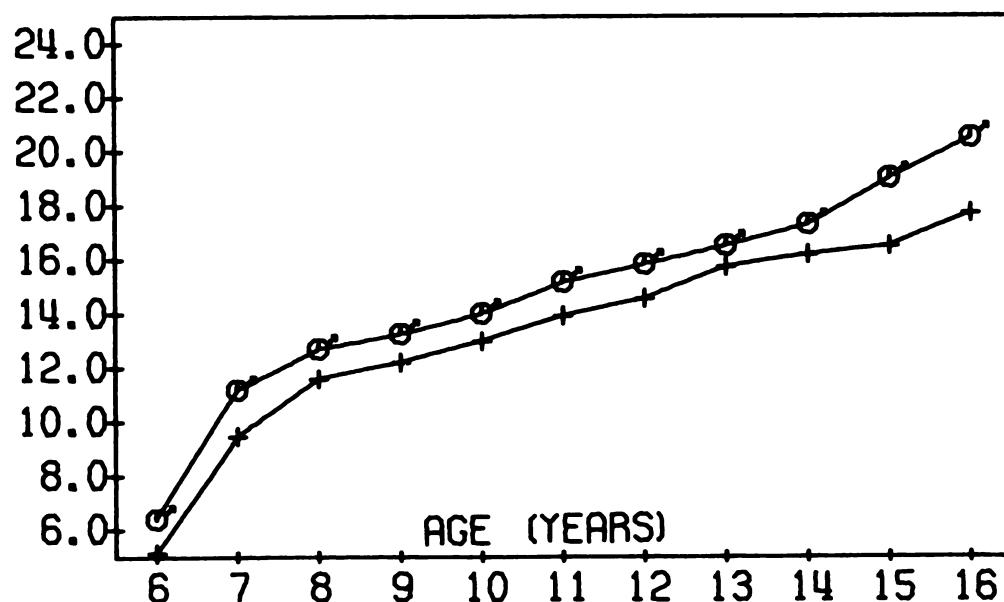
LINEAR MEASUREMENT  
Variable 135



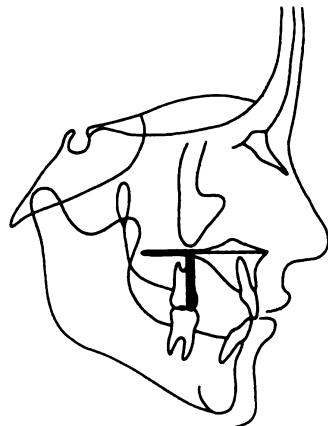
Upper Molar Mesial Cemento-  
Enamel Junction perpendicular  
to Palatal Plane

UMJ<sub>L</sub>ANS-PNS 20<sub>L</sub>10-45

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	22	6.4	4.3	6	17	5.2	3.8	
7	40	11.2	2.4	7	26	9.5	2.9	
8	43	12.7	1.9	8	35	11.6	2.4	
9	47	13.3	2.2	9	31	12.2	2.3	
10	46	14.0	2.4	10	35	13.0	2.5	
11	43	15.2	2.4	11	30	13.9	2.2	
12	44	15.8	2.3	12	27	14.6	2.0	
13	42	16.5	2.4	13	29	15.7	2.4	
14	38	17.3	2.8	14	25	16.2	2.3	
15	30	19.0	3.0	15	19	16.5	2.2	
16	22	20.5	3.2	*	16	9	17.7	2.2



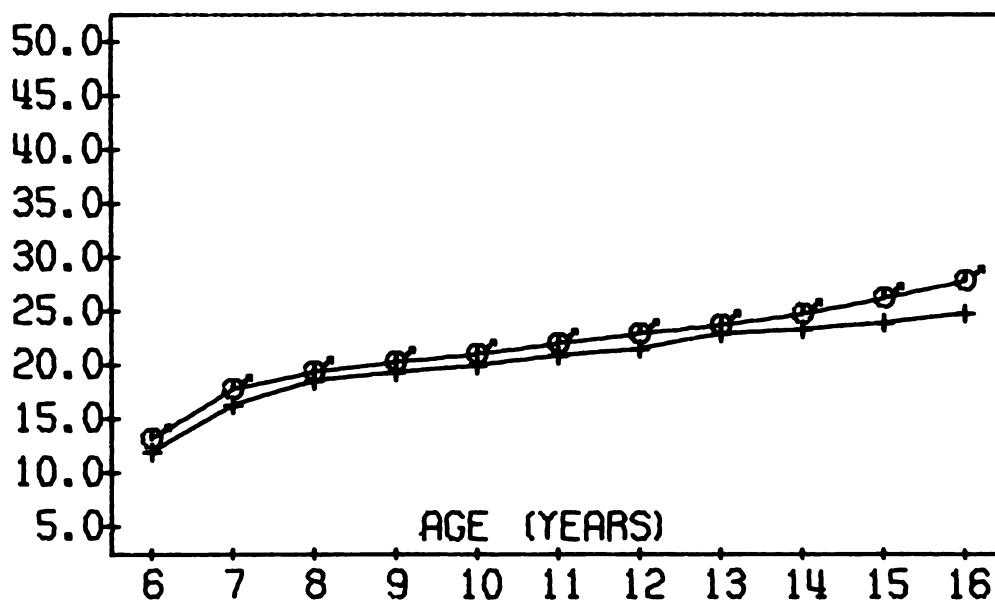
LINEAR MEASUREMENT  
Variable 136



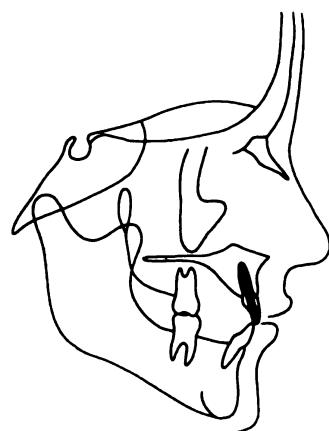
Upper Molar Mesial Cusp Tip  
perpendicular to Palatal  
Plane

UMTANS-PNS 1910-45

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	22	13.2	3.9		6	17	11.9	3.5
7	40	17.8	2.5	**	7	26	16.3	2.7
8	43	19.5	1.8	*	8	35	18.5	2.1
9	47	20.4	2.2	*	9	31	19.3	1.9
10	46	21.1	2.4	*	10	35	20.0	2.1
11	43	22.1	2.3	*	11	30	20.9	1.9
12	44	23.0	2.1	**	12	27	21.5	1.8
13	42	23.8	2.4		13	29	22.9	2.3
14	38	24.8	2.6	**	14	25	23.3	2.0
15	30	26.3	3.0	**	15	19	23.9	2.2
16	22	27.9	3.1	**	16	9	24.8	2.2

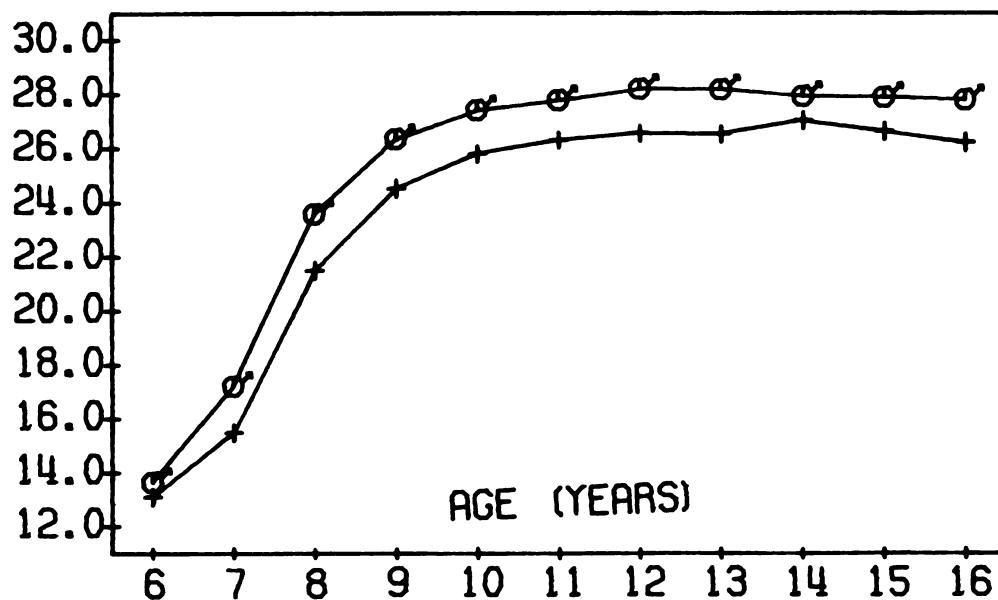


LINEAR MEASUREMENT  
Variable 137

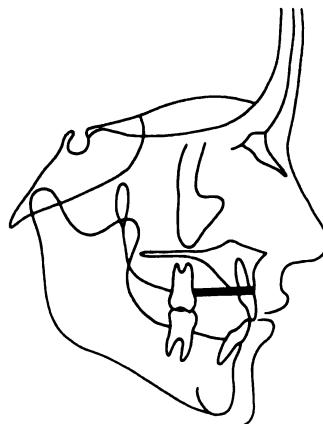


Upper Incisor Incisal Edge-  
Upper Incisor Apex  
UIE-UIA      7-12

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	13.6	5.2	6	25	13.0	4.9
7	44	17.2	7.7	7	31	15.4	6.4
8	44	23.5	5.0	8	36	21.4	5.2
9	47	26.3	2.4	9	31	24.4	2.4
10	46	27.4	1.8	10	35	25.7	2.6
11	43	27.7	1.6	11	30	26.2	1.6
12	44	28.1	2.4	12	27	26.5	1.7
13	43	28.1	1.5	13	29	26.5	1.6
14	40	27.9	1.6	14	25	27.0	1.3
15	33	27.8	1.8	15	19	26.6	1.7
16	23	27.7	1.6	16	9	26.1	0.8



LINEAR MEASUREMENT  
Variable 138

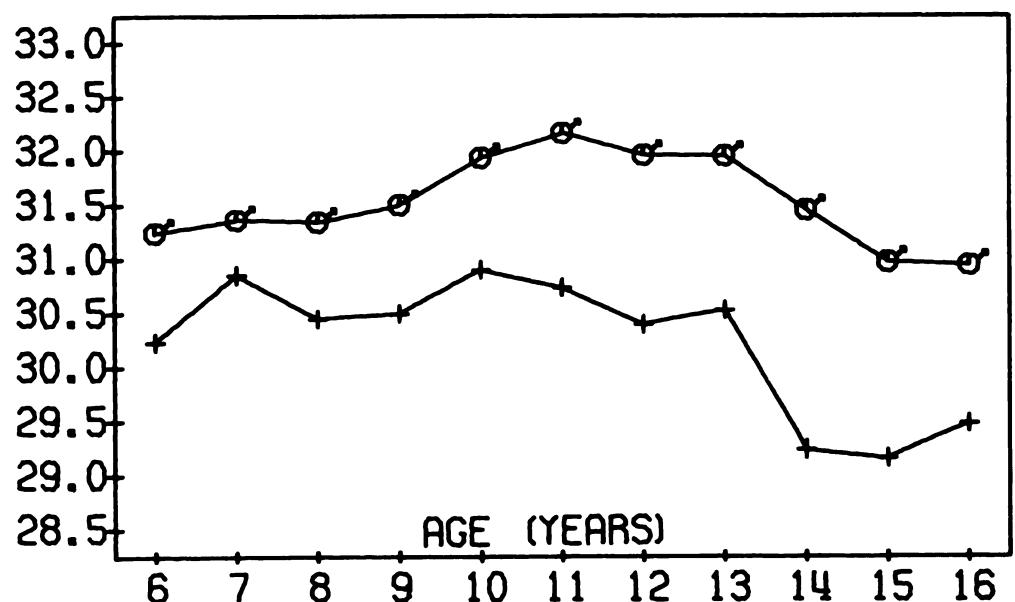


Supradentale-Upper Molar Mesial  
Cemento-Enamel Junction

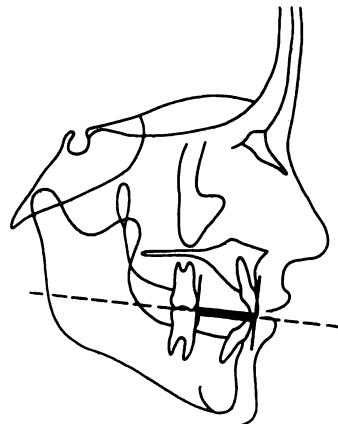
SD-UMJ

8-20

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	22	31.2	2.1	6	18	30.2	2.1
7	40	31.4	2.1	7	26	30.9	2.7
8	43	31.3	1.9	8	35	30.4	2.4
9	47	31.5	2.0	9	31	30.5	2.7
10	46	31.9	2.0	10	35	30.9	2.3
11	43	32.2	2.0	11	30	30.7	2.4
12	44	32.0	2.2	12	27	30.4	2.4
13	42	32.0	2.0	13	29	30.5	2.1
14	39	31.5	2.5	14	25	29.2	2.2
15	30	31.0	2.6	15	19	29.2	2.2
16	22	30.9	2.2	16	9	29.5	2.0



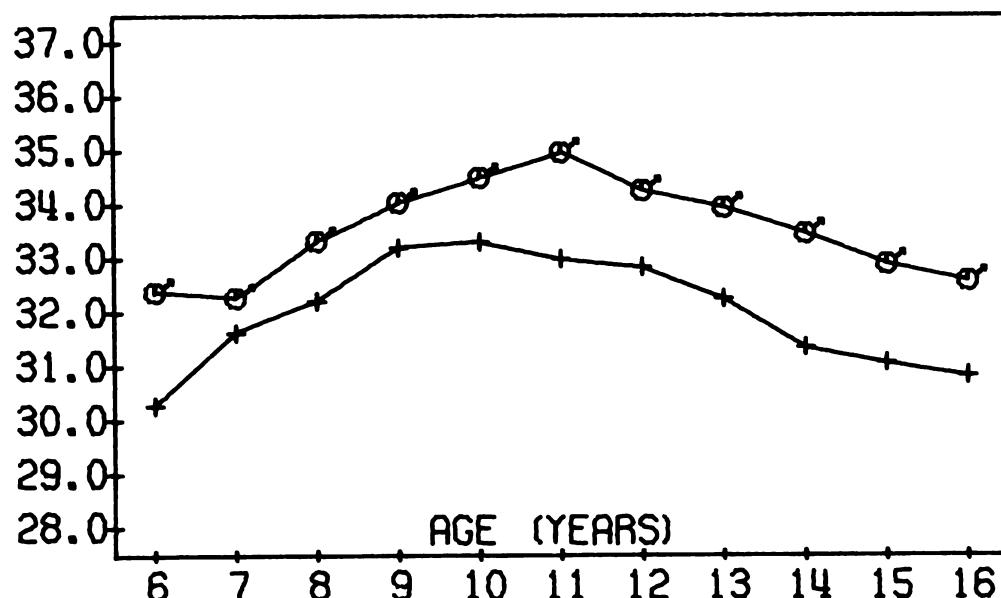
LINEAR MEASUREMENT  
Variable 139



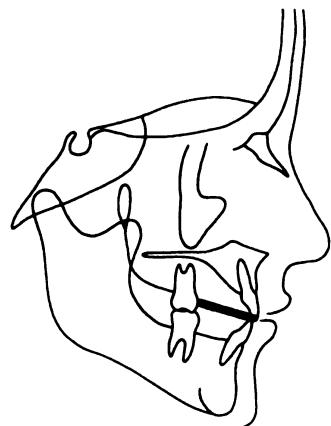
Upper Molar Mesial Contact  
Point perpendicular to Upper  
Incisor Incisal Edge  
on Downs Occlusal Plane

ADP-PDP<sub>L</sub>UMC- 56-57<sub>L</sub>55-  
ADP-PDP<sub>L</sub>UIE 56-57<sub>L</sub>7

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	18	32.4	2.5	6	16	30.3	3.6
7	38	32.3	2.1	7	24	31.6	3.4
8	40	33.3	2.6	8	35	32.2	3.2
9	47	34.0	2.2	9	31	33.2	2.9
10	45	34.5	2.2	10	34	33.3	2.7
11	41	35.0	2.3	11	29	33.0	3.1
12	41	34.3	2.4	12	26	32.8	3.2
13	41	33.9	2.3	13	29	32.3	2.6
14	36	33.5	2.4	14	25	31.4	2.3
15	29	32.9	2.3	15	19	31.1	2.7
16	21	32.6	2.1	16	9	30.8	2.0



**LINEAR MEASUREMENT**  
Variable 140

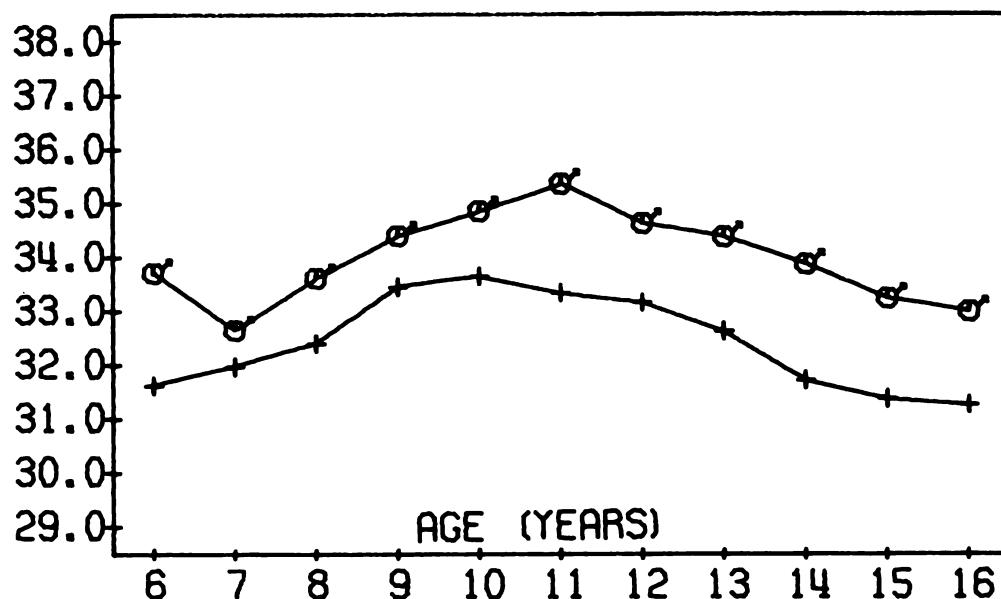


Upper Incisor Incisal Edge-  
Upper Molar Mesial Contact  
Point

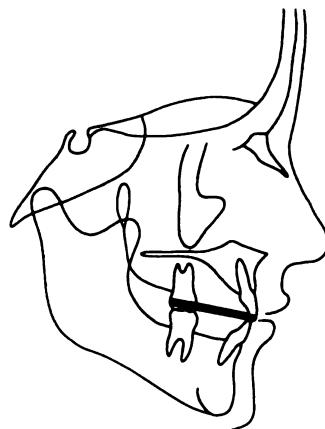
UIE-UMC

7-55

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	18	33.7	2.7	6	16	31.6	3.8
7	38	32.7	2.2	7	24	32.0	3.4
8	40	33.6	2.6	8	35	32.4	3.2
9	47	34.4	2.2	9	31	33.5	2.9
10	45	34.9	2.2	10	34	33.6	2.6
11	41	35.4	2.2	11	29	33.3	3.1
12	41	34.6	2.4	12	26	33.2	3.2
13	41	34.4	2.3	13	29	32.6	2.6
14	36	33.9	2.4	14	25	31.7	2.3
15	29	33.2	2.3	15	19	31.4	2.7
16	21	33.0	2.1	*	16	9	31.3



LINEAR MEASUREMENT  
Variable 141

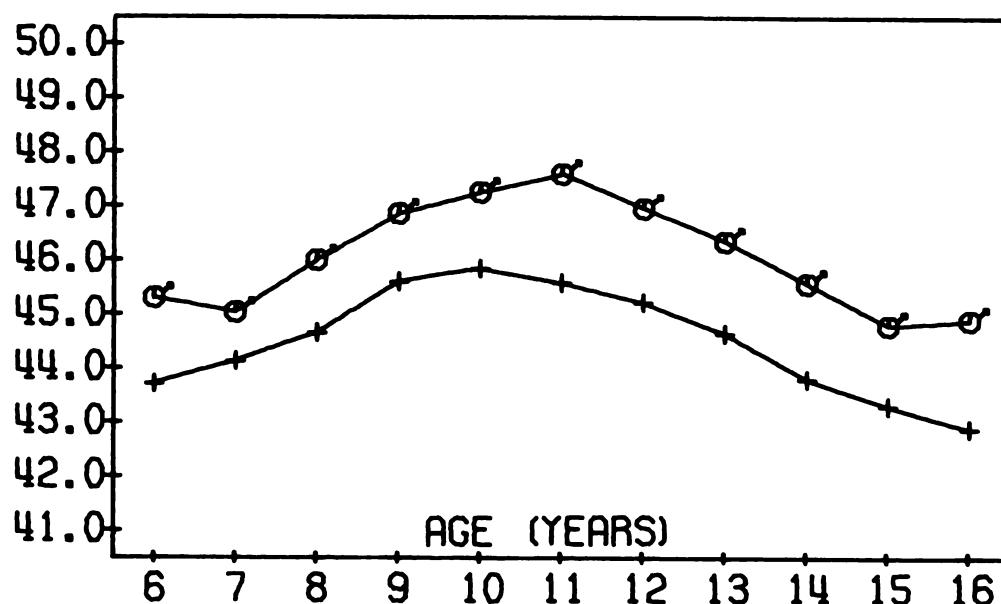


Upper Incisor Incisal Edge-  
Upper Molar Distal Contact  
Point

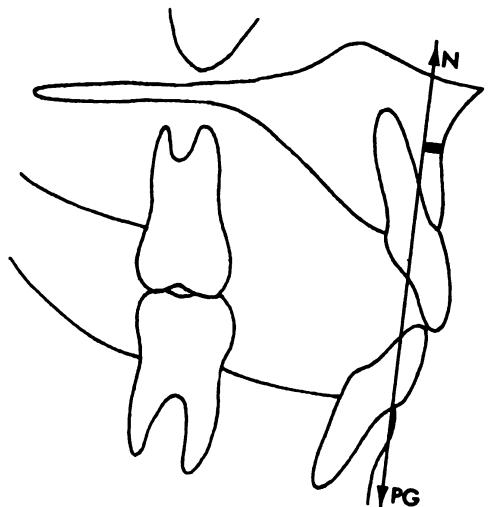
UIE-UDC

7-22

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	22	45.3	2.4	6	18	43.7	4.2
7	40	45.0	2.4	7	26	44.1	3.3
8	43	46.0	2.6	*	8	35	44.7
9	47	46.9	2.4	*	9	31	45.6
10	46	47.3	2.3	**	10	35	45.8
11	43	47.6	2.4	**	11	30	45.6
12	44	47.0	2.5	**	12	27	45.2
13	42	46.4	2.5	**	13	29	44.7
14	39	45.6	2.9	**	14	25	43.8
15	30	44.8	3.0	**	15	19	43.3
16	22	44.9	2.2	**	16	9	42.9



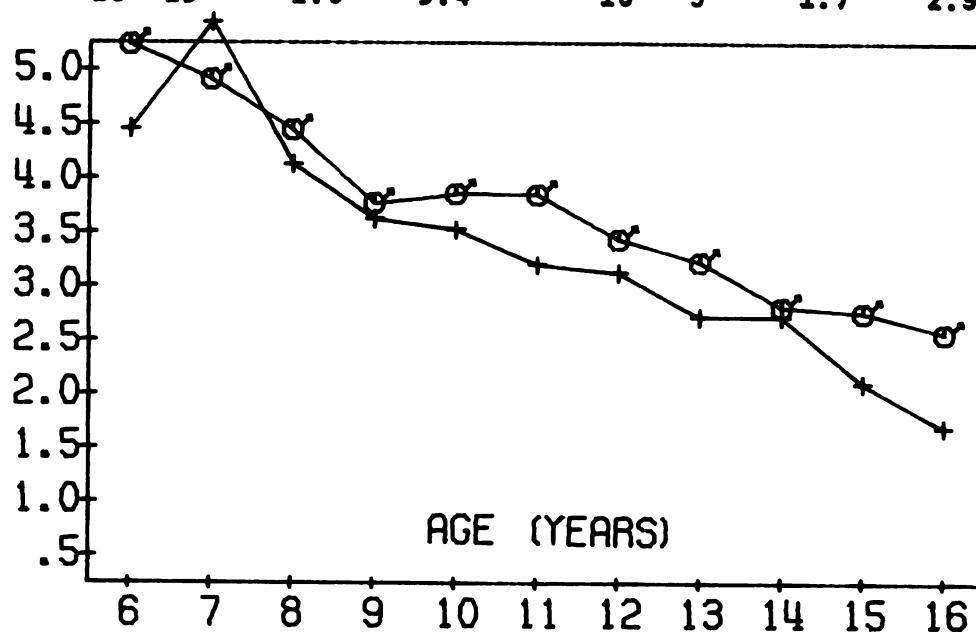
LINEAR MEASUREMENT  
Variable 142



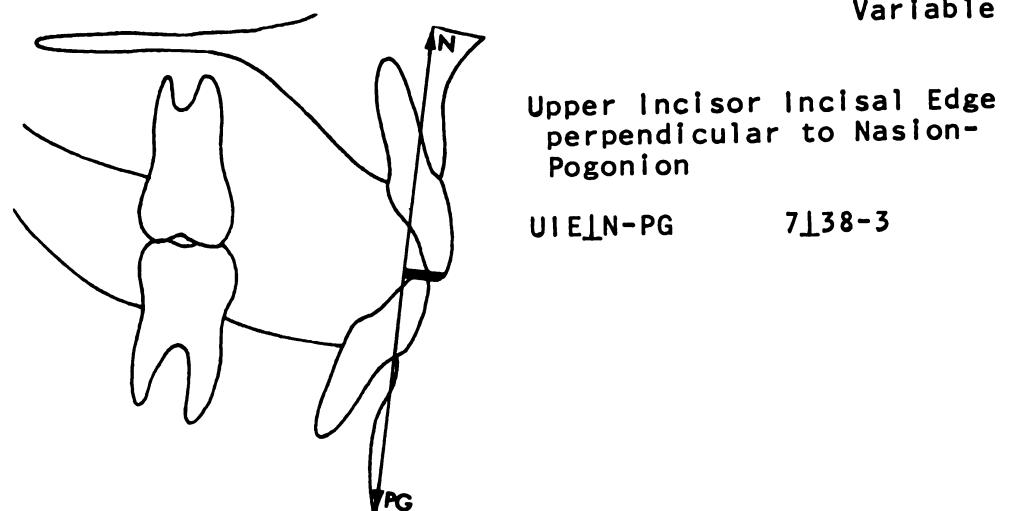
A Point perpendicular to  
Nasion-Pogonion  
Ricketts Analysis

$A \perp N-PG$       9.38-3

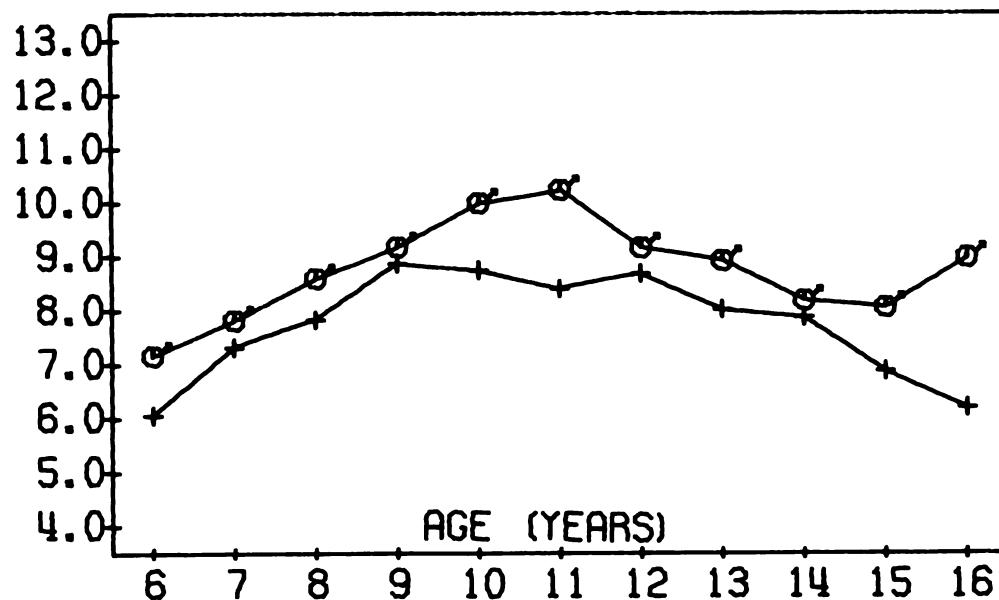
Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	5.2	2.3	6	25	4.5	2.2
7	44	4.9	2.4	7	31	5.4	2.5
8	44	4.4	2.5	8	36	4.1	2.4
9	47	3.8	2.3	9	31	3.6	2.7
10	46	3.9	2.5	10	35	3.5	2.8
11	43	3.8	2.4	11	30	3.2	2.2
12	44	3.4	2.6	12	27	3.1	2.7
13	43	3.2	2.6	13	29	2.7	2.6
14	40	2.8	2.6	14	25	2.7	3.0
15	33	2.8	2.8	15	19	2.1	3.0
16	23	2.6	3.4	16	9	1.7	2.9



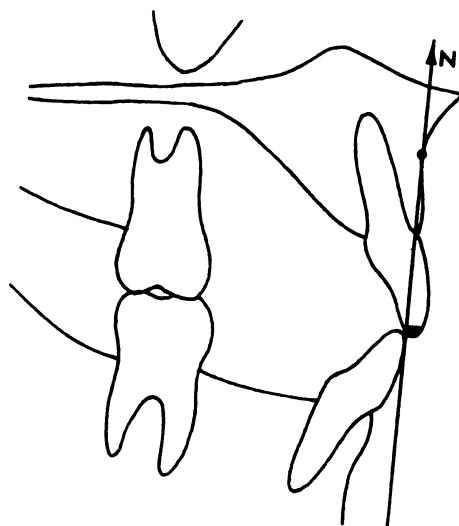
LINEAR MEASUREMENT  
Variable 143



Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	7.2	3.5	6	25	6.1	3.9
7	44	7.8	3.5	7	31	7.3	3.1
8	44	8.6	4.1	8	36	7.8	3.8
9	46	9.2	3.5	9	31	8.9	3.9
10	45	10.0	3.8	10	35	8.7	3.6
11	43	10.2	3.6	11	30	8.4	3.6
12	44	9.2	3.6	12	27	8.7	3.9
13	43	8.9	4.2	13	29	8.0	3.5
14	40	8.2	3.8	14	25	7.9	3.7
15	33	8.0	3.9	15	19	6.9	3.9
16	23	9.0	4.1	16	9	6.2	4.4



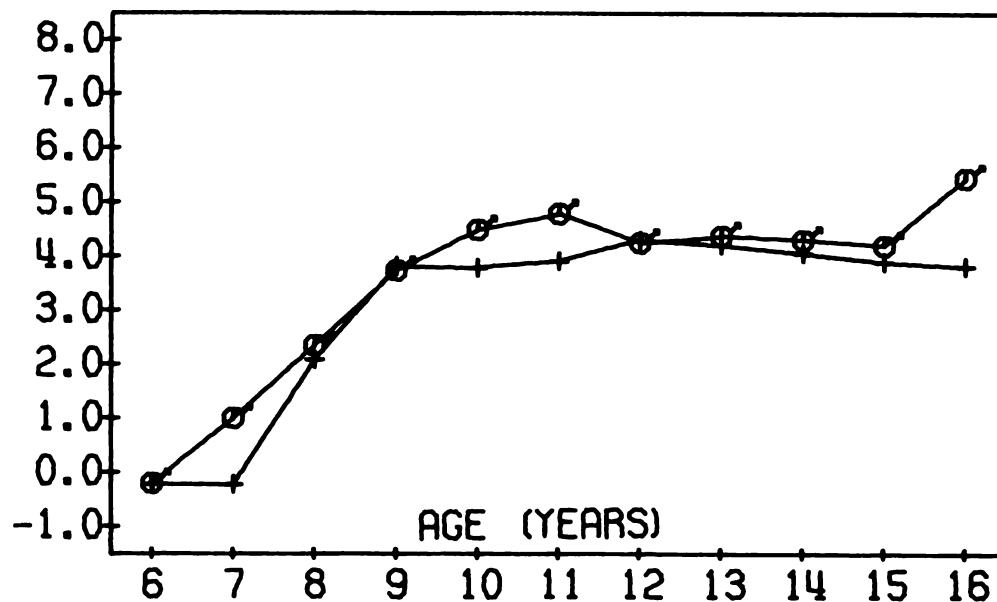
LINEAR MEASUREMENT  
Variable 144



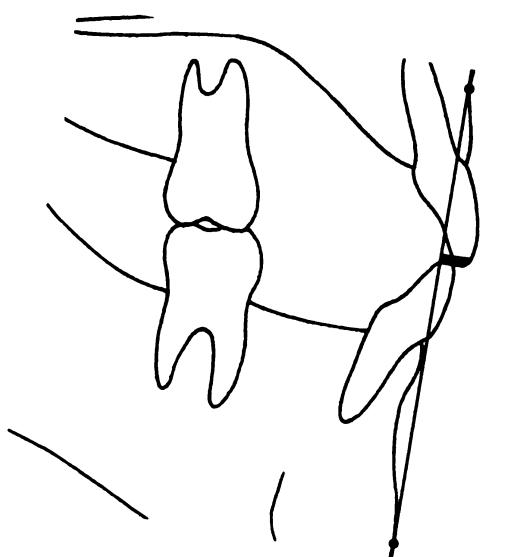
Upper Incisor Incisal Edge  
perpendicular to Nasion-  
A Point  
Steiner Analysis

UIEIN-A      7138-9

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	-0.2	1.9	6	25	-0.2	2.5
7	44	1.0	2.2	7	31	-0.2	2.6
8	44	2.3	2.4	8	36	2.1	2.1
9	47	3.7	2.1	9	31	3.8	2.4
10	46	4.5	2.2	10	35	3.8	2.2
11	43	4.8	2.3	11	30	3.9	2.4
12	44	4.3	2.7	12	27	4.3	2.8
13	43	4.4	2.5	13	29	4.2	2.6
14	40	4.3	2.8	14	25	4.1	2.5
15	33	4.2	3.0	15	19	3.9	3.2
16	23	5.5	2.7	16	9	3.8	2.7



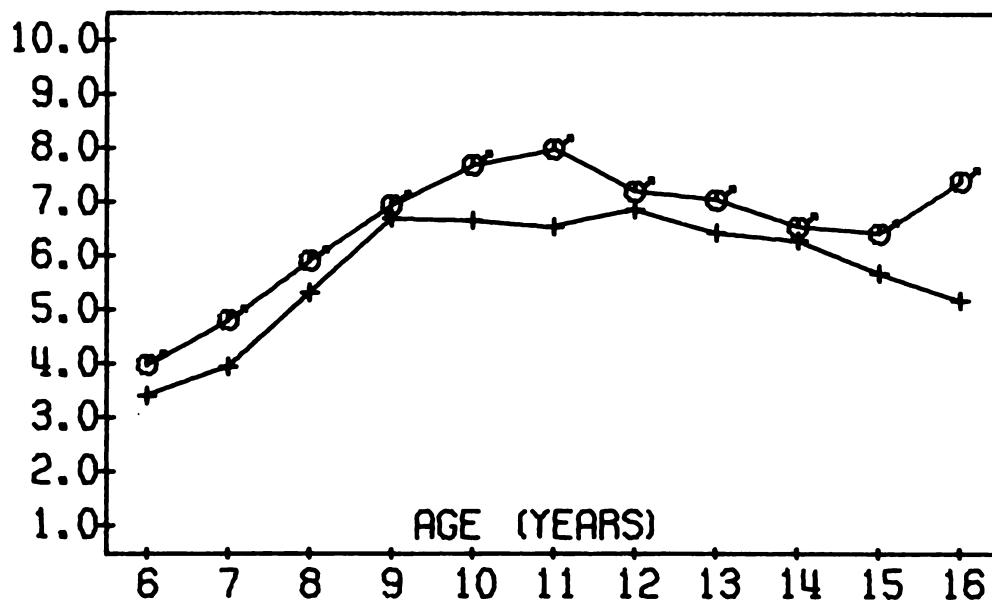
**LINEAR MEASUREMENT**  
Variable 145



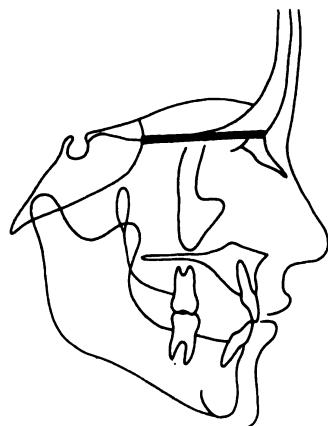
Upper Incisor Incisal Edge  
perpendicular to A Point-  
Pogonion  
Ricketts Analysis

UIE LA-PG      719-3

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	37	4.0	2.4	6	25	3.4	2.9
7	44	4.8	2.5	7	31	4.0	2.3
8	44	5.9	2.9	8	36	5.3	2.7
9	46	6.9	2.5	9	31	6.7	2.8
10	45	7.7	2.6	10	35	6.7	2.4
11	43	8.0	2.5	11	30	6.5	2.7
12	44	7.2	2.6	12	27	6.9	3.0
13	43	7.0	3.0	13	29	6.4	2.6
14	40	6.6	2.8	14	25	6.3	2.4
15	33	6.4	2.9	15	19	5.7	3.0
16	23	7.4	2.7	*	9	5.2	3.2



LINEAR MEASUREMENT  
Variable 146

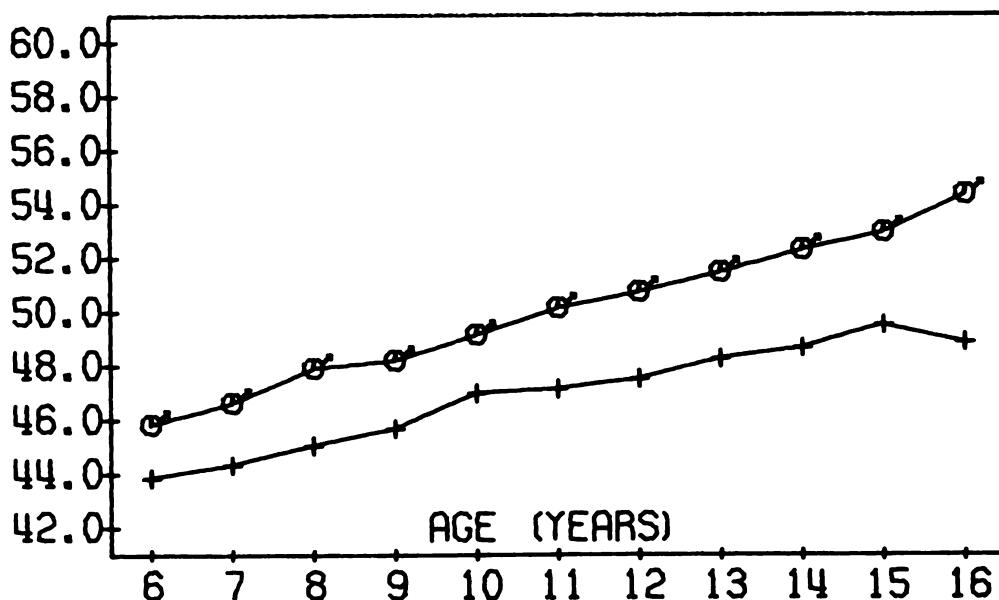


Ethmoid Registration Point-  
Nasion

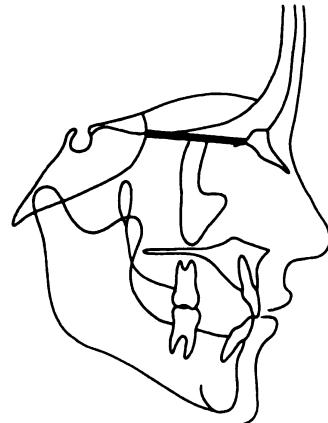
SE-N

36-38

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	45.9	2.3	6	25	43.9	3.1	
7	44	46.6	2.4	7	31	44.3	3.2	
8	44	47.9	2.4	8	36	45.1	3.1	
9	47	48.2	2.5	9	31	45.7	3.1	
10	46	49.2	2.6	10	35	47.0	3.0	
11	43	50.2	2.5	11	30	47.2	3.4	
12	44	50.8	2.8	12	27	47.5	3.0	
13	43	51.5	3.2	13	29	48.3	3.2	
14	40	52.3	2.9	14	25	48.7	3.2	
15	33	53.0	3.4	15	19	49.5	2.8	
16	23	54.4	3.7	**	16	9	48.9	2.4



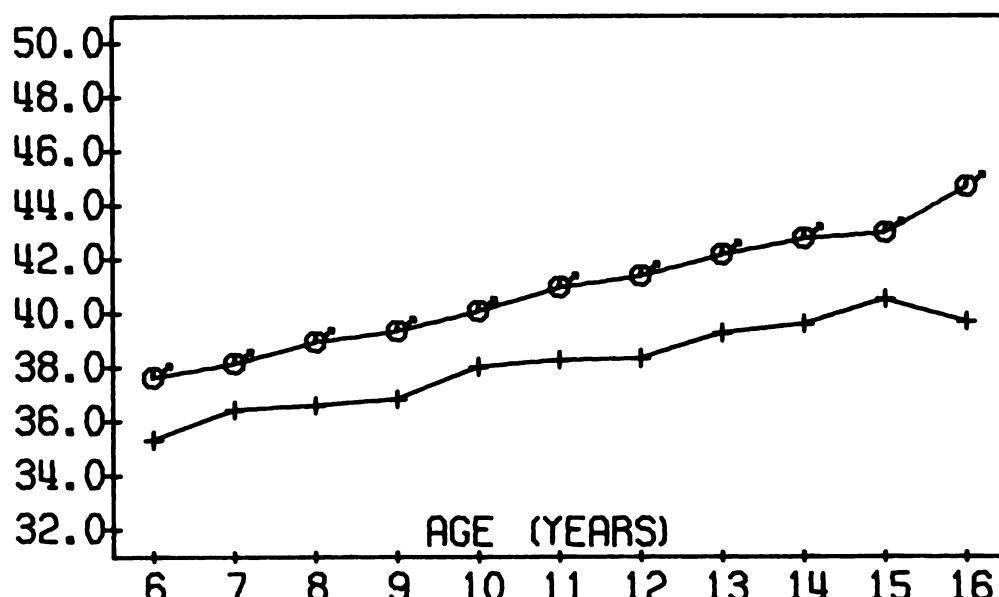
LINEAR MEASUREMENT  
Variable 147



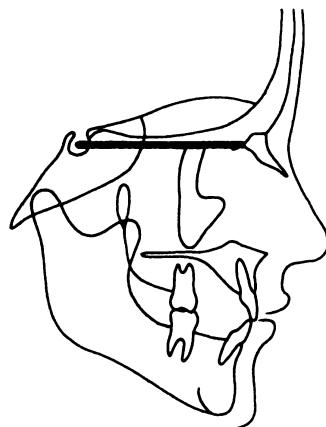
Ethmoid Registration Point-  
Fronto-Maxillary Nasal Suture

SE-FMN      36-39

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	37.6	2.7	6	25	35.3	3.4
7	44	38.2	2.8	7	31	36.4	2.9
8	44	39.0	2.8	8	36	36.6	3.0
9	47	39.4	2.5	9	31	36.8	3.3
10	46	40.1	3.0	10	35	38.0	3.3
11	43	41.0	2.8	11	30	38.3	3.4
12	44	41.4	3.2	12	27	38.3	3.0
13	43	42.2	3.0	13	29	39.3	3.4
14	40	42.8	2.9	14	25	39.6	3.6
15	33	43.0	3.8	15	19	40.5	3.2
16	23	44.7	3.8	16	9	39.7	2.6



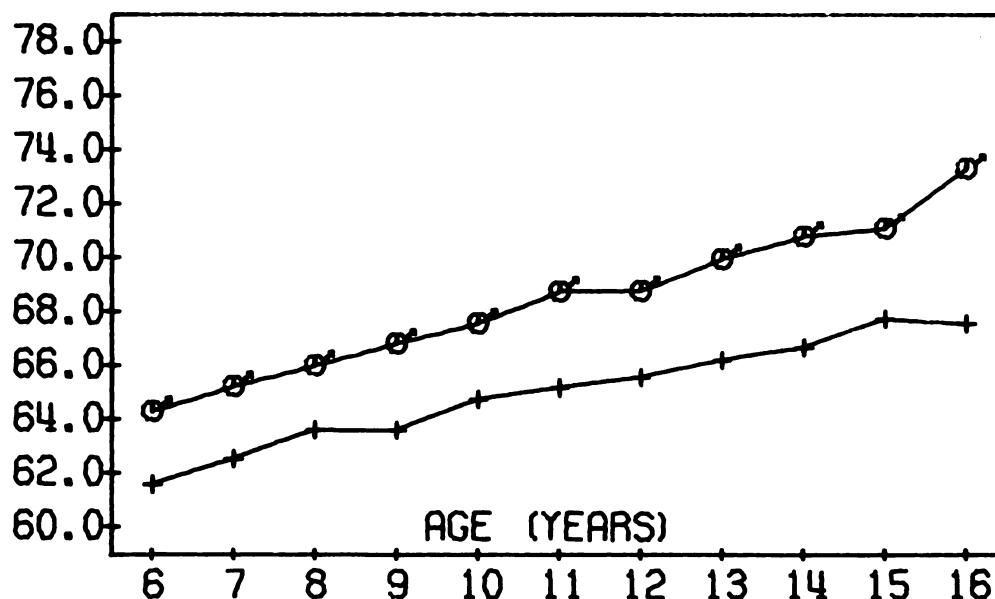
**LINEAR MEASUREMENT**  
**Variable 148**



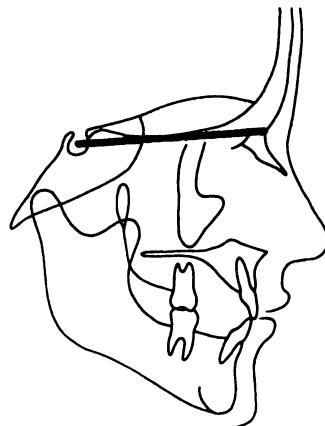
**Sella-Fronto-Maxillary Nasal Suture**

**S-FMN**      **35-39**

Age	N	Male			Age	N	Female		
		Mean mm	S.D. mm	**			Mean mm	S.D. mm	
6	37	64.3	2.9	**	6	25	61.6	3.0	
7	44	65.2	3.0	**	7	31	62.5	2.1	
8	44	66.0	3.1	**	8	36	63.6	2.7	
9	47	66.8	2.9	**	9	31	63.6	2.7	
10	46	67.6	3.2	**	10	35	64.7	3.0	
11	43	68.8	2.9	**	11	30	65.2	3.2	
12	44	68.8	3.2	**	12	27	65.6	2.8	
13	43	70.0	3.3	**	13	29	66.2	3.4	
14	40	70.8	3.8	**	14	25	66.7	3.1	
15	33	71.1	3.6	**	15	19	67.7	3.1	
16	23	73.3	3.6	**	16	9	67.6	3.9	



LINEAR MEASUREMENT  
Variable 149

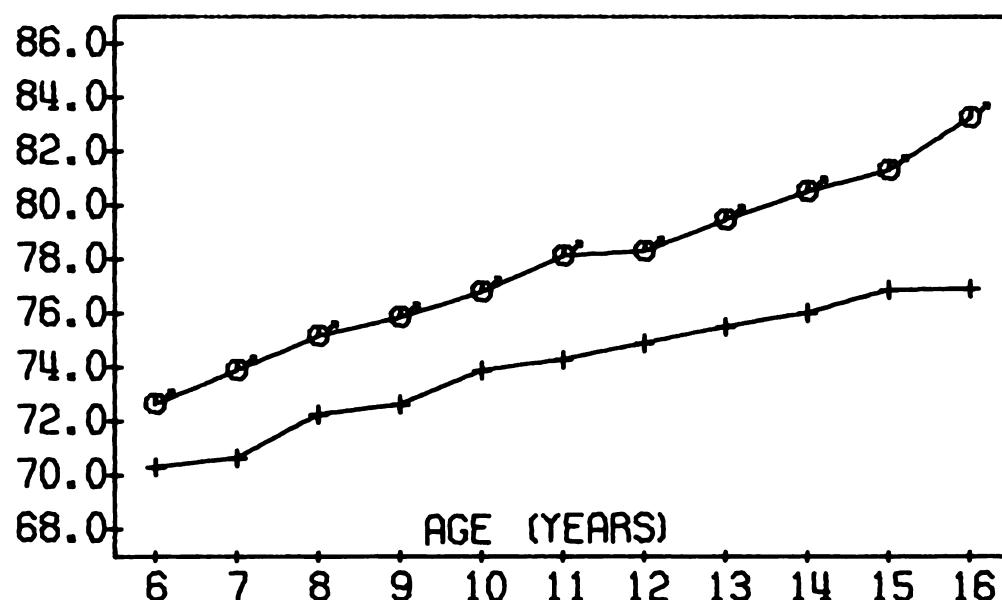


Sella-Nasion

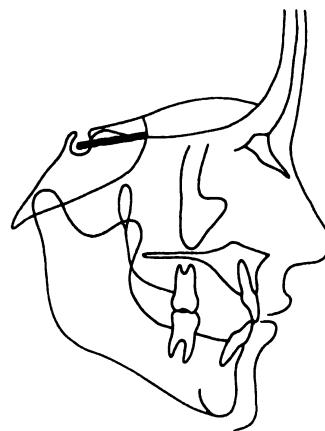
S-N

35-38

Age	N	Male			Age	N	Female		
		Mean mm	S.D. mm	**			Mean mm	S.D. mm	
6	37	72.7	2.8	**	6	25	70.3	2.7	
7	44	73.9	3.1	**	7	31	70.6	2.6	
8	44	75.2	3.0	**	8	36	72.3	2.9	
9	47	75.9	3.3	**	9	31	72.6	2.7	
10	46	76.8	3.2	**	10	35	73.9	2.8	
11	43	78.2	2.9	**	11	30	74.3	3.0	
12	44	78.3	3.3	**	12	27	74.9	3.0	
13	43	79.5	3.8	**	13	29	75.5	3.1	
14	40	80.5	4.1	**	14	25	76.0	2.9	
15	33	81.3	4.0	**	15	19	76.9	2.8	
16	23	83.3	3.8	**	16	9	76.9	3.9	



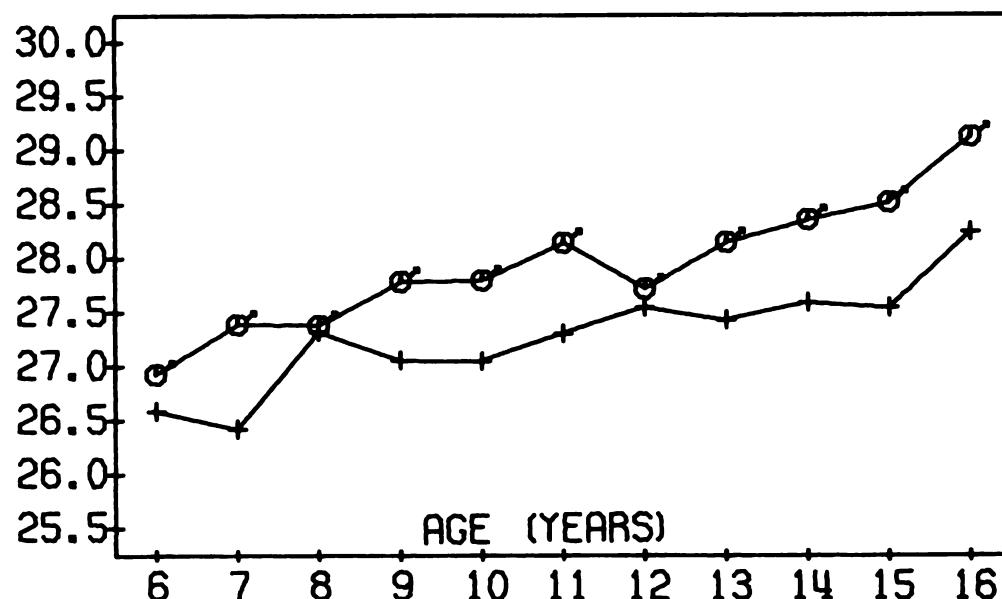
LINEAR MEASUREMENT  
Variable 150



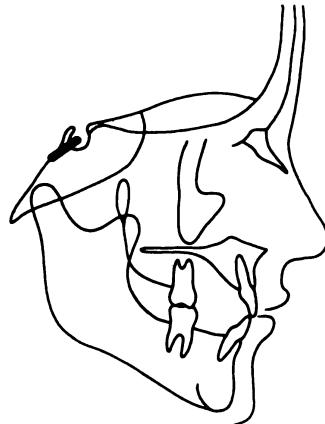
Sella-Ethmoid Registration Point

S-SE      35-36

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	26.9	2.2	6	25	26.6	1.6
7	44	27.4	2.3	7	31	26.4	1.8
8	44	27.4	2.4	8	36	27.3	1.8
9	47	27.8	2.4	9	31	27.1	2.0
10	46	27.8	2.4	10	35	27.0	1.9
11	43	28.1	2.4	11	30	27.3	2.3
12	44	27.7	2.9	12	27	27.5	2.0
13	43	28.2	2.6	13	29	27.4	2.1
14	40	28.4	2.8	14	25	27.6	2.1
15	33	28.5	3.0	15	19	27.5	2.7
16	23	29.1	2.6	16	9	28.2	2.1



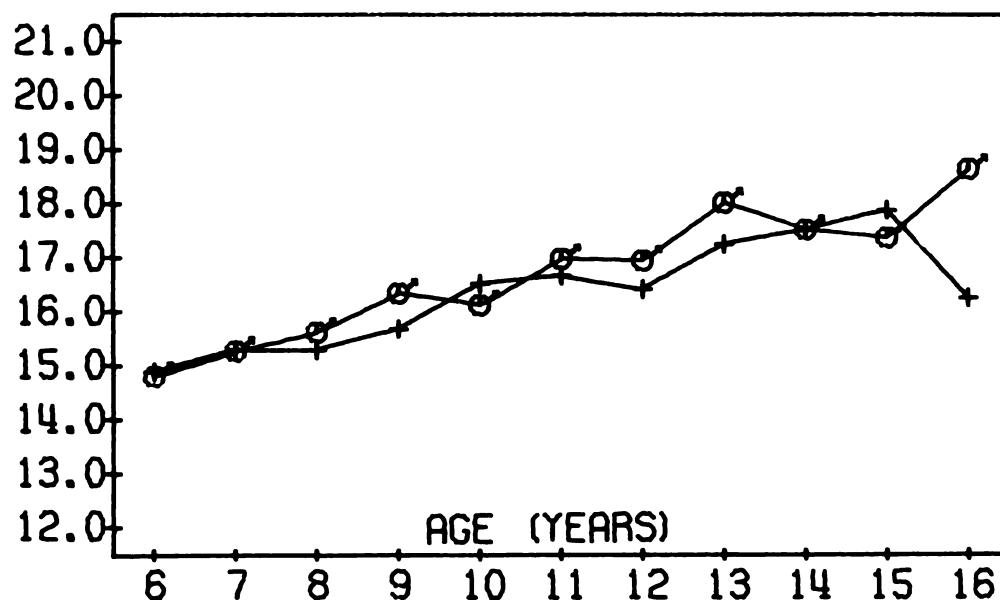
LINEAR MEASUREMENT  
Variable 151



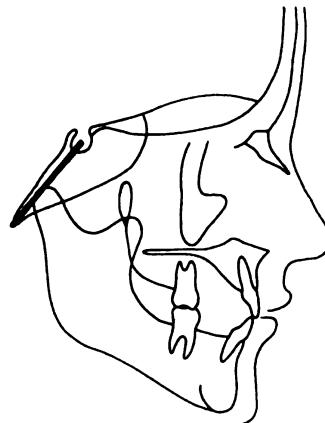
Sella-Spheno-Occipital  
Synchondrosis

S-SOS      35-34

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	14.8	1.6	6	25	14.9	1.7
7	44	15.3	1.4	7	31	15.3	1.8
8	44	15.6	1.9	8	36	15.3	2.0
9	47	16.4	2.0	9	31	15.7	2.2
10	46	16.1	2.1	10	35	16.5	2.1
11	43	17.0	2.4	11	30	16.7	2.5
12	44	16.9	2.5	12	27	16.4	2.8
13	43	18.0	2.8	13	29	17.3	2.2
14	40	17.5	1.8	14	25	17.5	2.3
15	33	17.4	2.2	15	19	17.9	2.3
16	23	18.6	2.6	*	16	9	16.3



LINEAR MEASUREMENT  
Variable 152

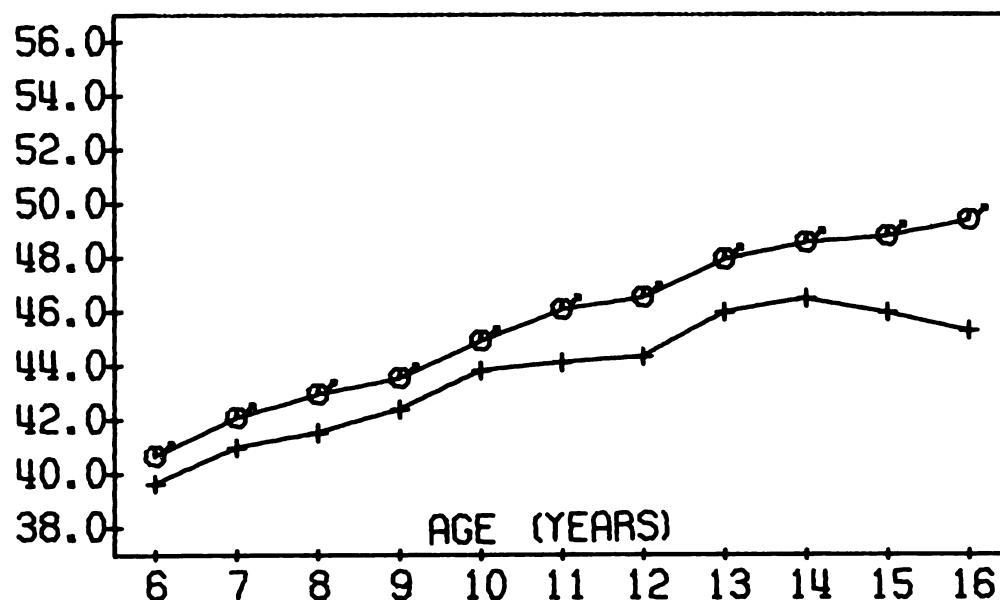


Sella-Basion

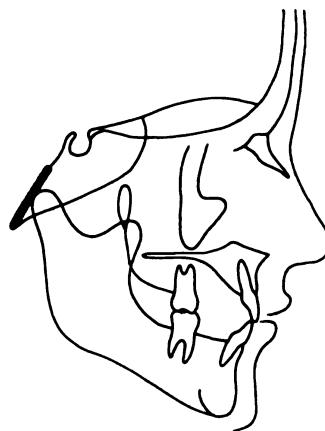
S-BA

35-30

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	40.7	3.0	6	25	39.6	2.4
7	44	42.1	2.8	7	31	41.0	3.1
8	44	43.0	2.7	*	8	36	41.5
9	47	43.6	2.7	9	31	42.4	3.4
10	46	44.9	3.3	**	10	35	43.8
11	43	46.1	3.5	**	11	30	44.1
12	44	46.6	3.5	*	12	27	44.3
13	43	48.0	4.0	*	13	29	46.0
14	40	48.6	4.1	**	14	25	46.5
15	33	48.8	4.0	**	15	19	46.0
16	23	49.4	3.8	**	16	9	45.3



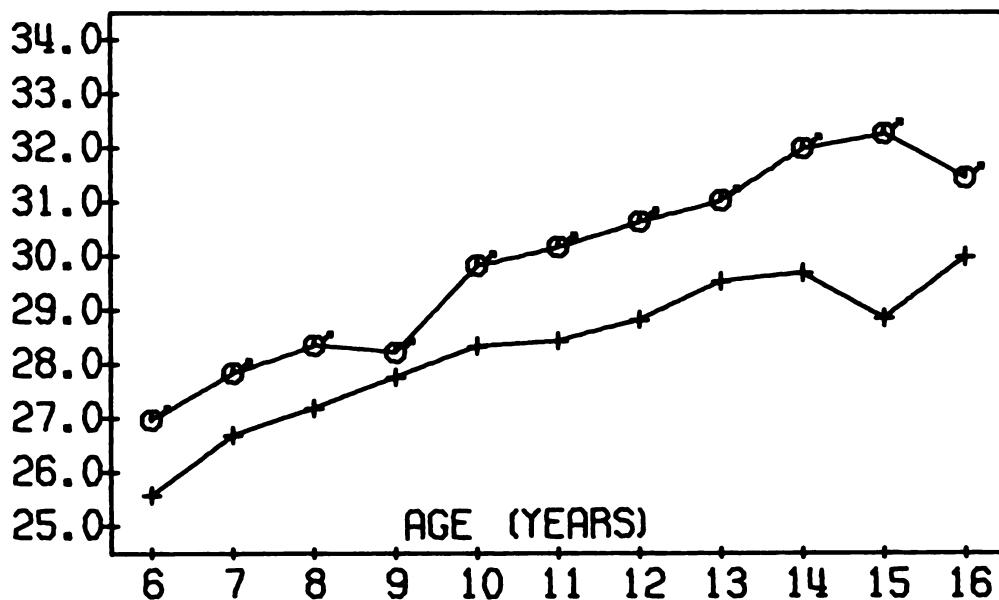
LINEAR MEASUREMENT  
Variable 153



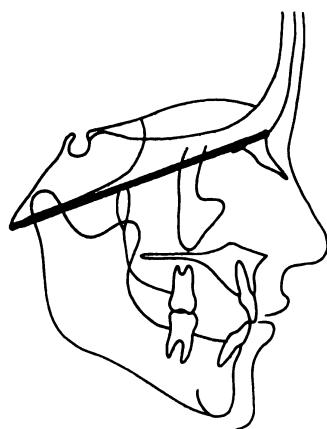
Basion-Spheno-Occipital  
Synchondrosis

BA-SOS      30-34

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	27.0	2.7	6	25	25.6	2.6
7	44	27.8	2.5	7	31	26.7	2.7
8	44	28.4	2.7	8	36	27.2	3.2
9	47	28.2	2.7	9	31	27.8	2.9
10	46	29.8	3.2	10	35	28.3	3.1
11	43	30.2	3.8	11	30	28.4	3.1
12	44	30.6	3.8	12	27	28.8	3.0
13	43	31.0	4.5	13	29	29.5	3.4
14	40	32.0	4.0	14	25	29.7	3.7
15	33	32.3	4.0	15	19	28.8	3.7
16	23	31.4	3.8	16	9	30.0	3.2



**LINEAR MEASUREMENT**  
**Variable 154**

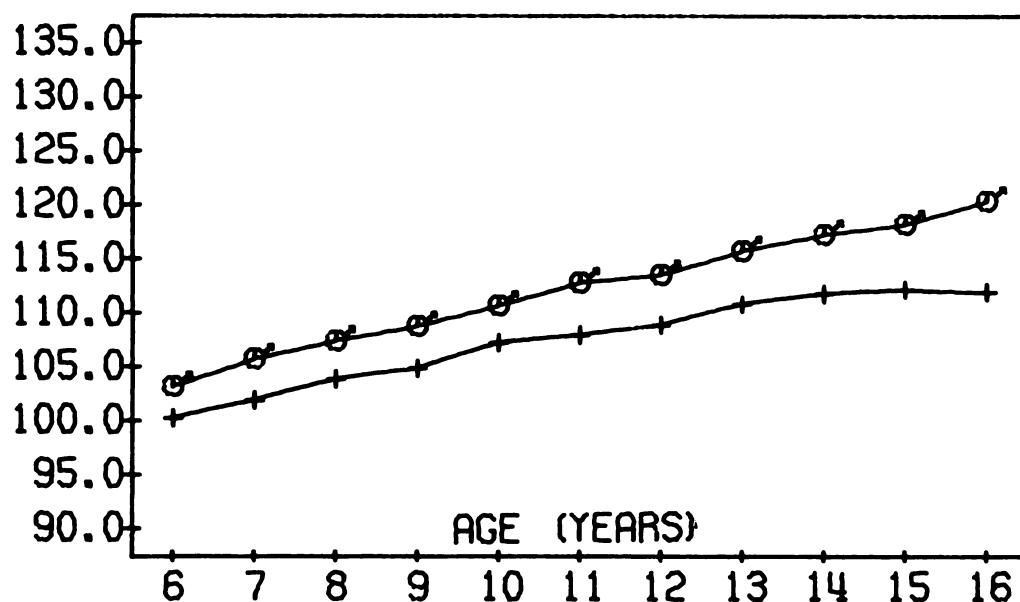


**Basion-Nasion**

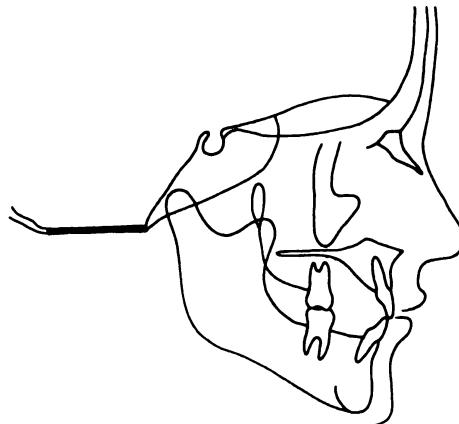
**BA-N**

**30-38**

<b>Age</b>	<b>N</b>	<b>Male</b>		<b>S.D.</b>	<b>Age</b>	<b>N</b>	<b>Female</b>	
		<b>Mean</b>	<b>mm</b>				<b>Mean</b>	<b>mm</b>
6	37	103.3	3.7	**	6	25	100.3	4.5
7	44	105.8	4.6	**	7	31	101.9	4.7
8	44	107.5	3.8	**	8	36	103.9	5.3
9	47	108.9	4.2	**	9	31	104.9	4.9
10	46	110.8	4.2	**	10	35	107.3	5.2
11	43	112.9	4.3	**	11	30	107.9	5.0
12	44	113.6	4.2	**	12	27	108.9	4.7
13	43	115.8	5.2	**	13	29	110.9	4.6
14	40	117.3	5.4	**	14	25	111.8	4.9
15	33	118.3	4.4	**	15	19	112.2	4.7
16	23	120.4	4.2	**	16	9	112.0	4.8



LINEAR MEASUREMENT  
Variable 155

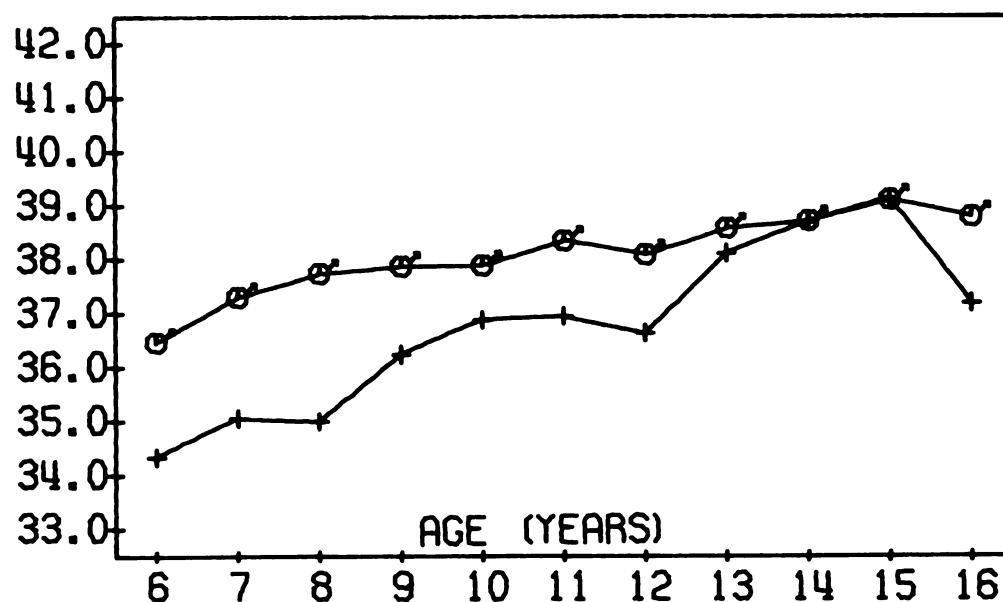


Basion-Opisthion

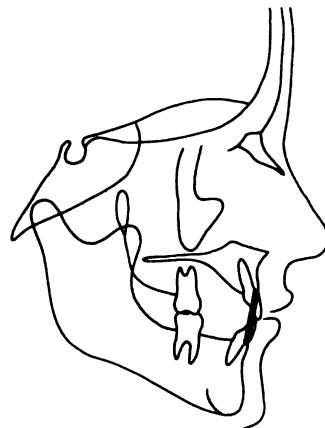
BA-OP

30-29

Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	36.5	3.6	*	6	25	34.3	3.3
7	44	37.3	3.6	**	7	31	35.1	3.4
8	44	37.7	3.6	**	8	36	35.0	2.9
9	47	37.9	3.4	*	9	31	36.2	2.8
10	46	37.9	3.1		10	35	36.9	3.3
11	43	38.4	3.4		11	30	37.0	3.4
12	44	38.1	3.1	*	12	27	36.6	2.7
13	43	38.6	3.2		13	29	38.1	2.9
14	40	38.7	3.6		14	25	38.7	3.1
15	33	39.1	3.2		15	19	39.1	3.0
16	23	38.8	3.4		16	9	37.2	3.2



LINEAR MEASUREMENT  
Variable 156

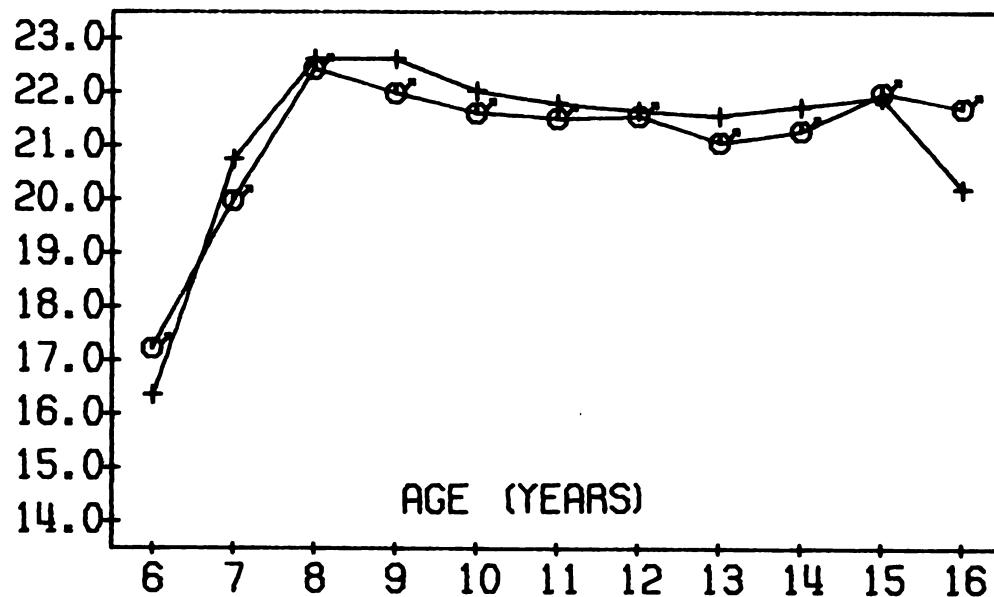


Supradentale-Infradentale

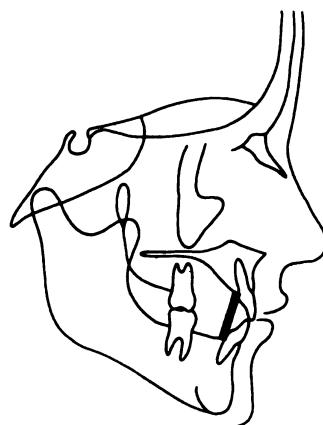
SD-ID

8-5

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	17.2	4.1	6	25	16.4	3.7
7	44	20.0	4.4	7	31	20.8	4.9
8	44	22.4	3.4	8	36	22.6	3.5
9	46	22.0	2.9	9	31	22.6	3.6
10	45	21.6	3.3	10	35	22.0	2.4
11	43	21.5	3.1	11	30	21.8	2.5
12	44	21.6	2.7	12	27	21.7	2.5
13	43	21.1	2.7	13	29	21.6	1.9
14	40	21.3	2.5	14	25	21.7	2.3
15	33	22.0	3.0	15	19	21.9	2.7
16	23	21.7	3.1	16	9	20.2	1.3



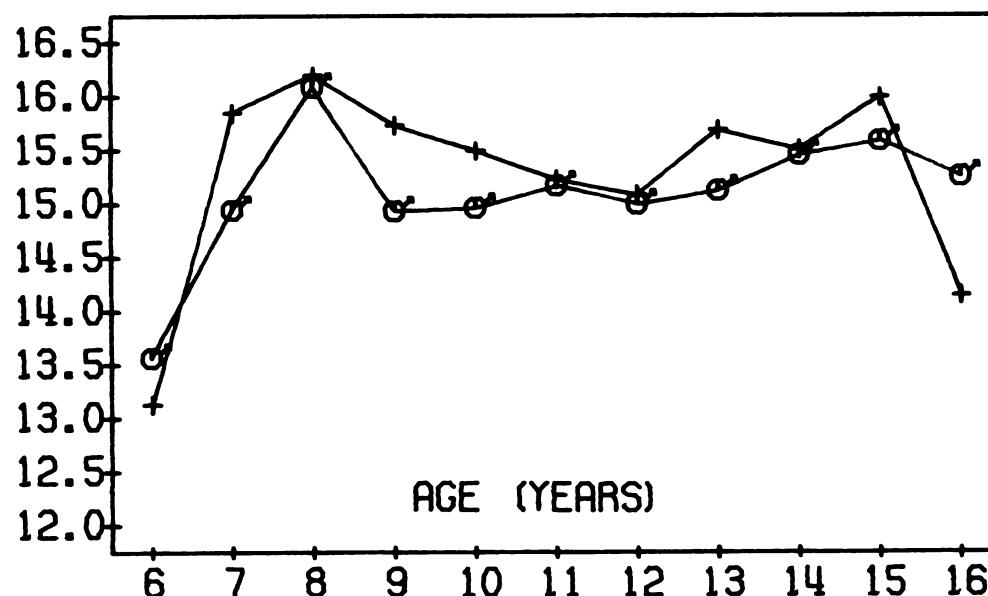
**LINEAR MEASUREMENT  
Variable 157**



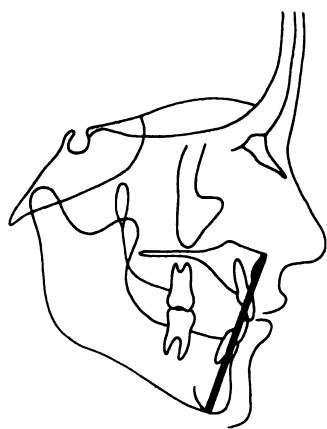
Upper Incisor Lingual Bony  
Contact Point-Lower Incisor  
Lingual Bony Contact Point

UIB-LIB      13-14

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	13.6	3.2	6	25	13.1	3.5
7	44	14.9	3.2	7	31	15.9	3.5
8	44	16.1	3.2	8	36	16.2	3.0
9	46	14.9	2.6	9	31	15.7	3.1
10	45	15.0	2.9	10	35	15.5	2.8
11	43	15.2	2.7	11	30	15.2	2.5
12	44	15.0	2.7	12	27	15.1	2.7
13	43	15.1	2.7	13	29	15.7	2.7
14	40	15.5	2.4	14	25	15.5	2.5
15	33	15.6	2.6	15	19	16.0	2.5
16	23	15.3	2.4	16	9	14.1	1.2



LINEAR MEASUREMENT  
Variable 158

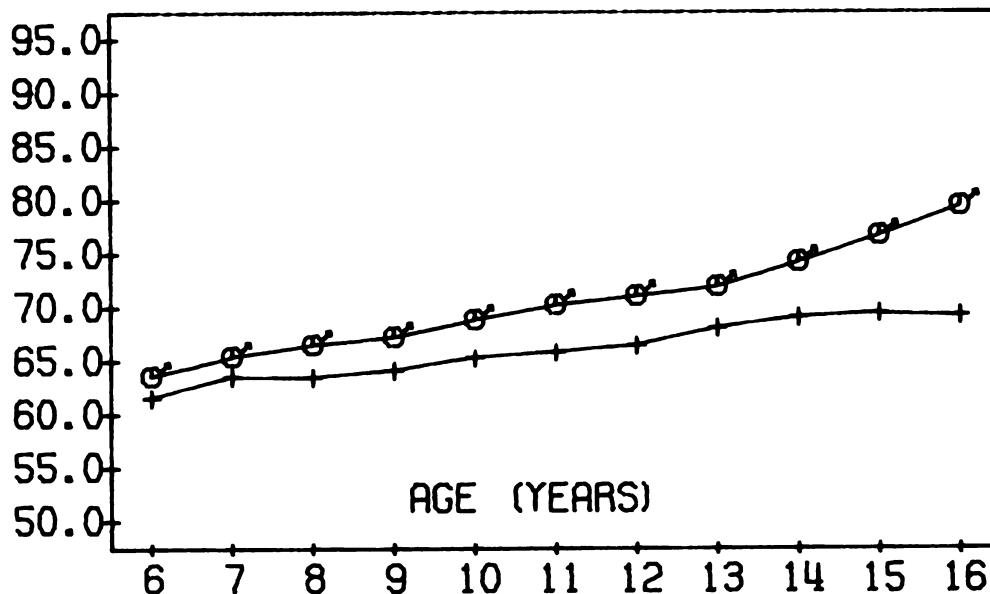


Menton-Anterior Nasal Spine

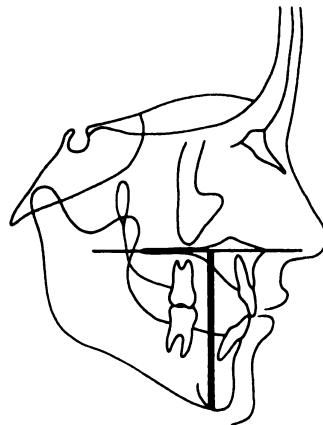
ME-ANS

1-10

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	63.7	4.0	6	25	61.6	3.9
7	44	65.5	4.4	7	31	63.6	4.1
8	44	66.6	4.4	8	36	63.5	4.2
9	46	67.3	4.3	9	31	64.1	4.6
10	45	68.9	4.9	10	35	65.3	4.9
11	43	70.3	4.8	11	30	65.8	4.6
12	44	71.1	5.1	12	27	66.5	3.8
13	42	72.0	5.6	13	29	68.1	4.5
14	39	74.3	5.8	14	25	69.1	5.0
15	32	76.7	6.4	15	19	69.5	5.3
16	23	79.5	6.2	16	9	69.3	5.2



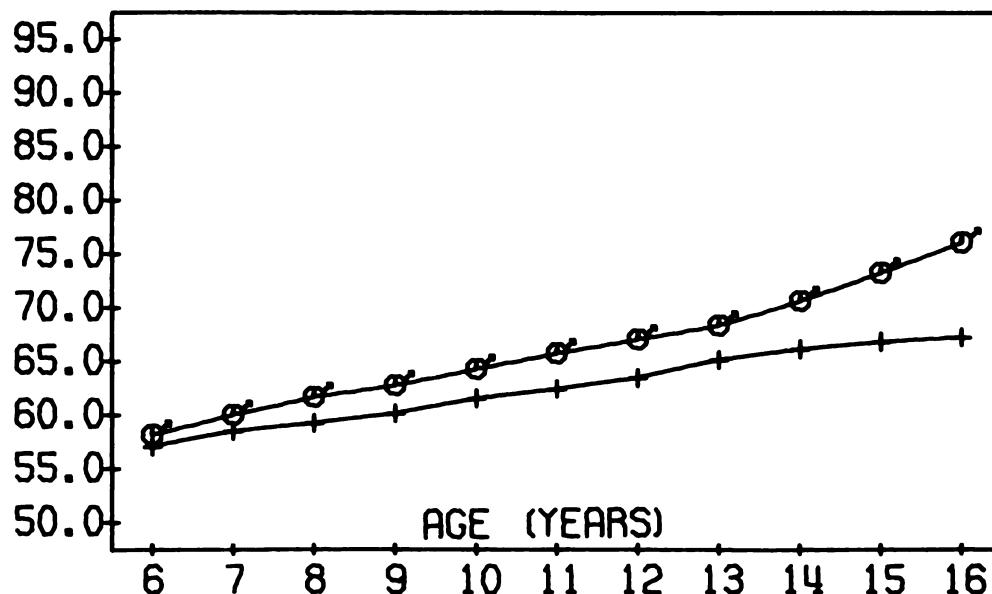
LINEAR MEASUREMENT  
Variable 159



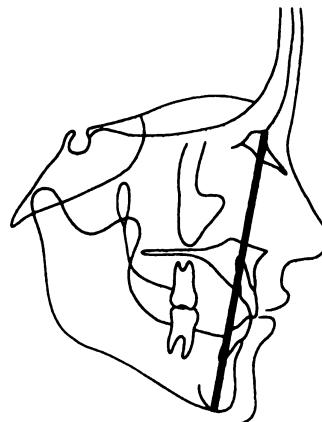
Menton perpendicular to  
Palatal Plane

ME<sub>L</sub>ANS-PNS 110-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	58.2	3.7	6	24	57.1	3.1
7	44	60.1	3.5	7	31	58.5	3.3
8	44	61.8	3.6	8	36	59.2	3.3
9	46	62.8	3.9	9	31	60.2	3.6
10	45	64.3	4.2	10	35	61.5	3.9
11	43	65.8	4.4	11	30	62.4	3.9
12	44	67.1	4.4	12	27	63.5	3.4
13	42	68.4	5.2	13	29	65.1	3.7
14	39	70.7	5.5	14	25	66.1	4.0
15	32	73.3	5.8	15	19	66.8	4.5
16	23	76.1	5.6	16	9	67.2	4.3



LINEAR MEASUREMENT  
Variable 160

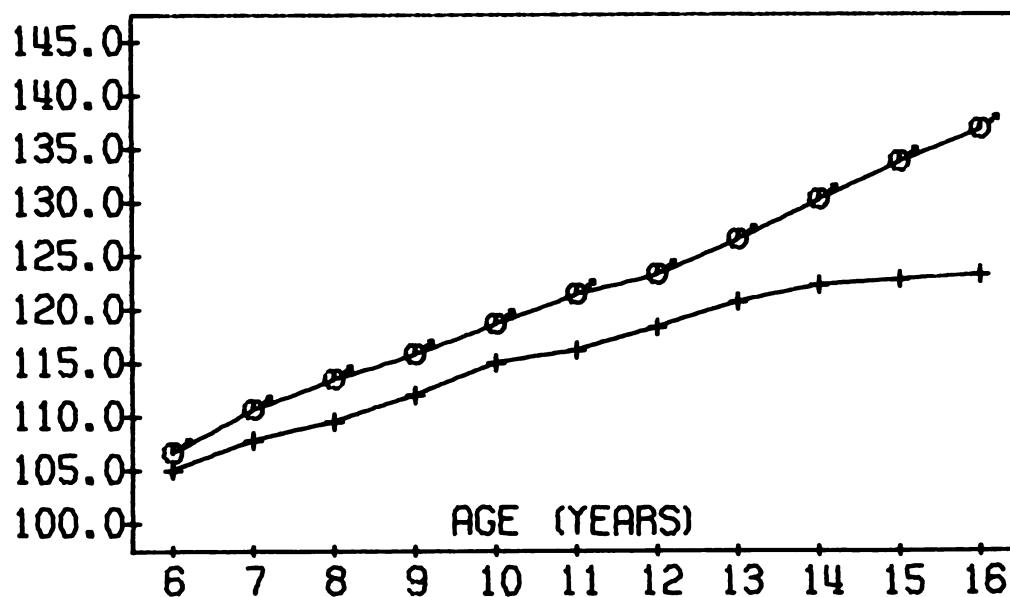


Menton-Nasion

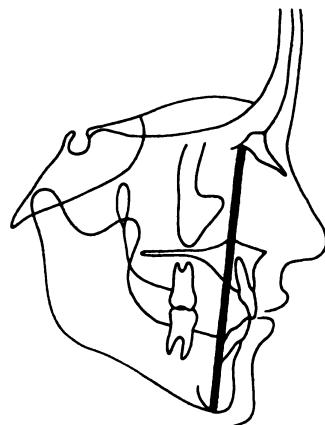
ME-N

1-38

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	106.7	5.2	6	25	105.0	5.1
7	44	110.7	5.8	7	31	107.8	5.3
8	44	113.6	5.6	8	36	109.5	5.4
9	46	115.9	5.4	9	31	112.1	5.7
10	45	118.7	5.7	10	35	115.1	6.7
11	43	121.5	6.0	11	30	116.2	6.4
12	44	123.3	6.3	12	27	118.3	6.0
13	42	126.6	7.0	13	29	120.7	5.8
14	39	130.3	7.9	14	25	122.3	5.9
15	32	133.8	7.8	15	19	122.7	6.4
16	23	136.8	7.9	16	9	123.2	5.1



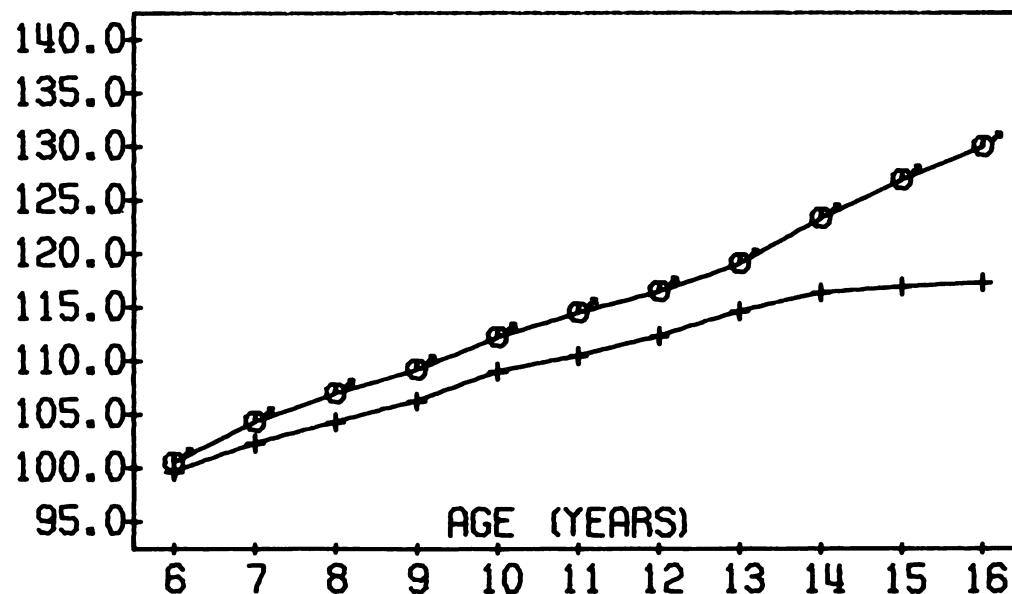
LINEAR MEASUREMENT  
Variable 161



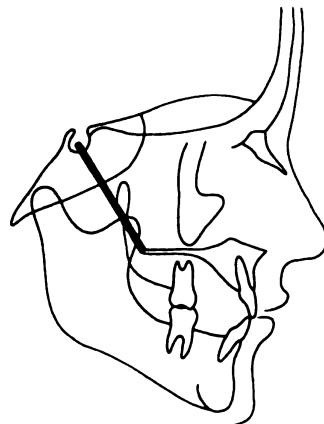
Menton-Fronto-Maxillary Nasal  
Suture

ME-FMN      1-39

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	100.6	5.3	6	25	99.7	4.4
7	44	104.4	5.3	*	7	31	102.3
8	44	107.0	5.4	**	8	36	104.3
9	46	109.3	5.2	**	9	31	106.2
10	45	112.2	5.5	**	10	35	109.0
11	43	114.6	5.4	**	11	30	110.5
12	44	116.6	6.2	**	12	27	112.3
13	42	119.2	7.0	**	13	29	114.6
14	39	123.4	7.5	**	14	25	116.4
15	32	126.9	7.4	**	15	19	116.9
16	23	130.0	7.2	**	16	9	117.3



LINEAR MEASUREMENT  
Variable 162

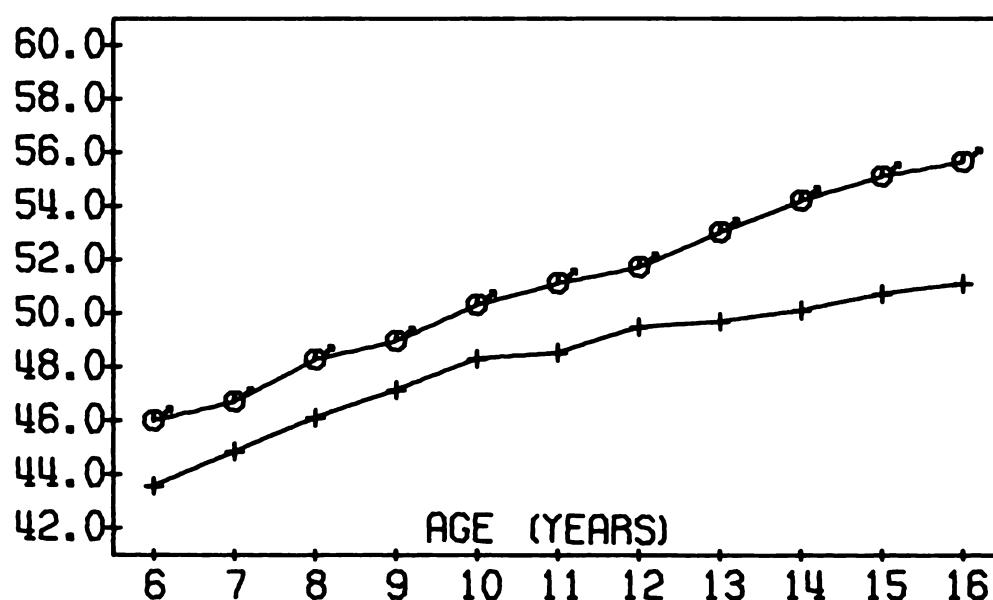


Sella-Posterior Nasal Spine

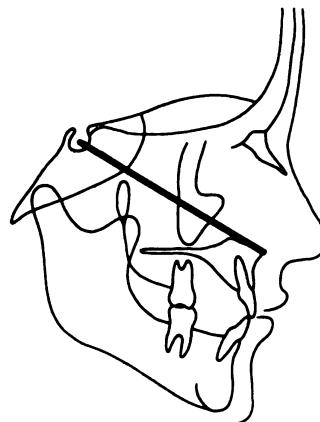
S-PNS

35-45

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	46.0	3.0	6	25	43.6	2.7
7	44	46.7	3.1	7	31	44.9	2.4
8	44	48.3	2.8	8	36	46.1	2.9
9	47	49.0	2.7	9	31	47.1	3.1
10	46	50.3	3.0	10	35	48.3	2.7
11	43	51.2	3.2	11	30	48.5	2.6
12	44	51.8	3.4	12	27	49.5	2.8
13	43	53.0	3.6	13	29	49.7	3.0
14	39	54.2	3.4	14	25	50.1	2.3
15	33	55.1	3.6	15	19	50.7	2.6
16	23	55.7	3.9	16	9	51.1	3.0



LINEAR MEASUREMENT  
Variable 163

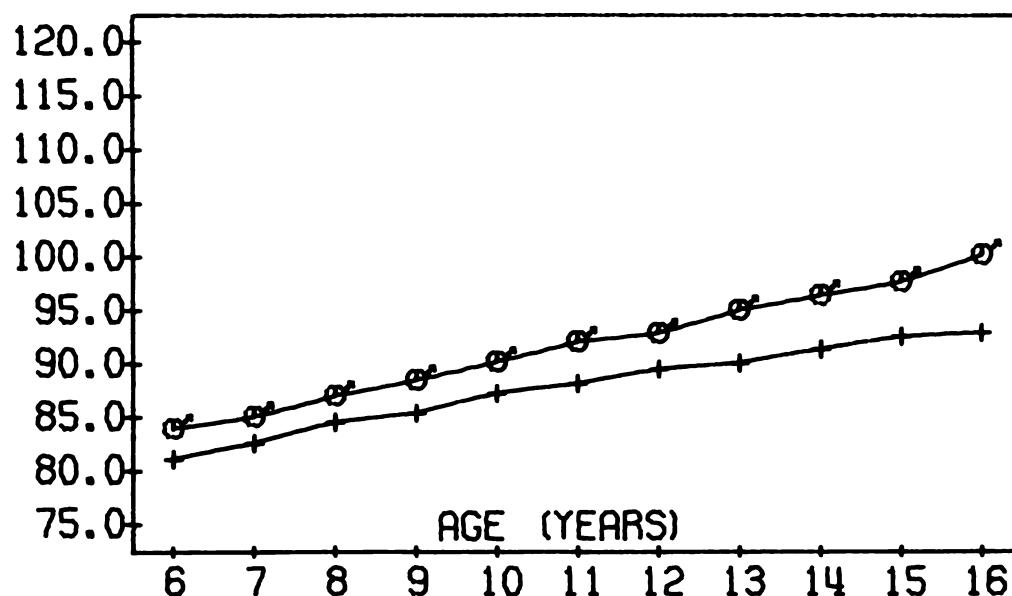


Sella-Anterior Nasal Spine

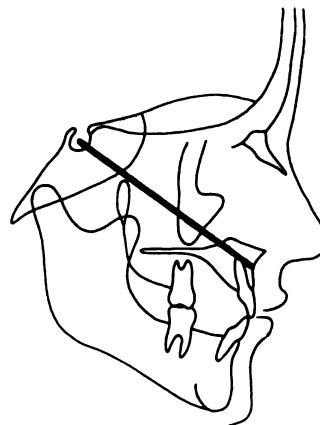
S-ANS

35-10

Age	N	Male			Age	N	Female		
		Mean	S.D.	mm			Mean	S.D.	mm
6	37	84.0	4.0	**	6	25	81.1	3.2	
7	44	85.1	4.1	**	7	31	82.6	3.6	
8	44	87.1	3.7	**	8	36	84.5	4.0	
9	47	88.5	3.9	**	9	31	85.4	3.8	
10	46	90.2	3.9	**	10	35	87.3	4.1	
11	43	92.1	3.7	**	11	30	88.2	4.4	
12	44	92.9	4.6	**	12	27	89.5	3.6	
13	43	95.1	4.7	**	13	29	90.1	4.0	
14	40	96.5	4.9	**	14	25	91.4	4.2	
15	33	97.7	5.1	**	15	19	92.5	4.2	
16	23	100.2	5.4	**	16	9	92.9	5.8	



LINEAR MEASUREMENT  
Variable 164

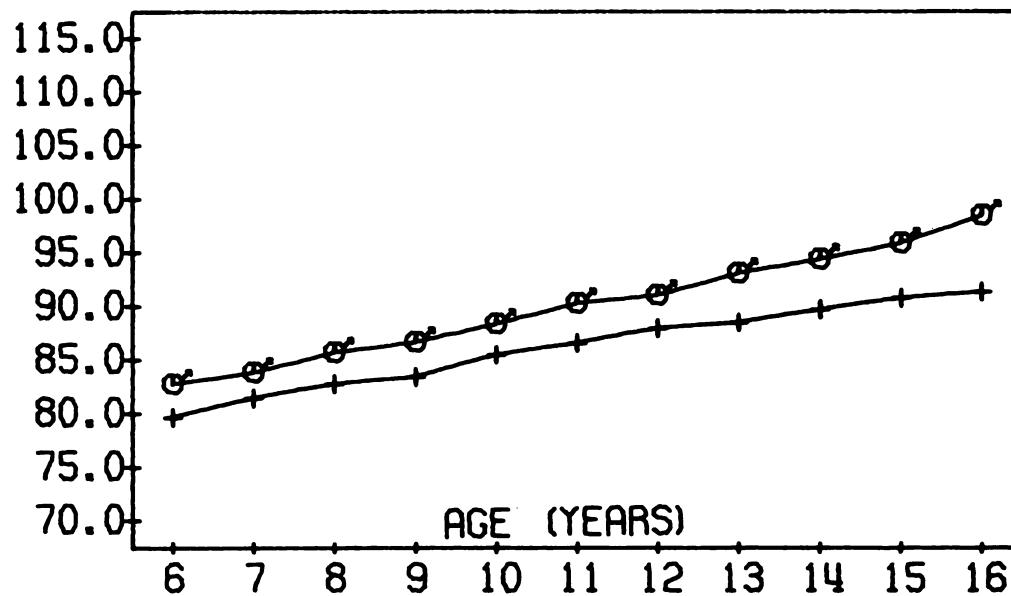


Sella-A Point

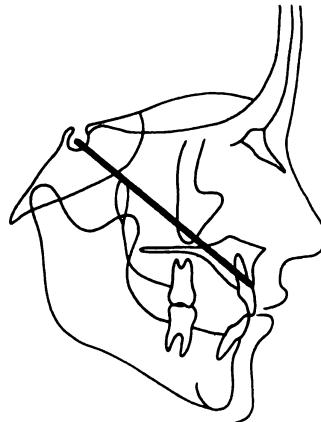
S-A

35-9

Age	N	Male			Age	N	Female		
		Mean	S.D.	mm			Mean	S.D.	mm
6	37	82.8	3.8	**	6	25	79.7	3.3	
7	44	83.9	3.9	**	7	31	81.5	3.6	
8	44	85.8	3.5	**	8	36	82.8	3.8	
9	47	86.7	3.7	**	9	31	83.5	4.1	
10	46	88.5	3.7	**	10	35	85.5	4.4	
11	43	90.4	3.5	**	11	30	86.6	4.1	
12	44	91.1	4.4	**	12	27	88.0	3.7	
13	43	93.2	4.6	**	13	29	88.5	4.1	
14	40	94.5	4.9	**	14	25	89.7	3.8	
15	33	96.0	4.8	**	15	19	90.8	4.3	
16	23	98.5	5.4	**	16	9	91.4	5.5	



LINEAR MEASUREMENT  
Variable 165

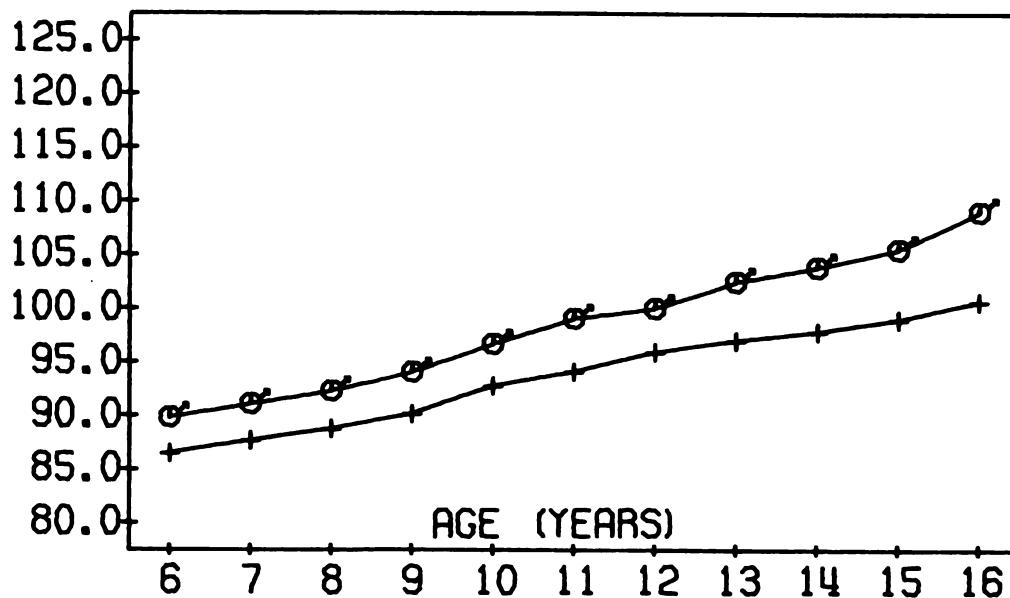


Sella-Supradentale

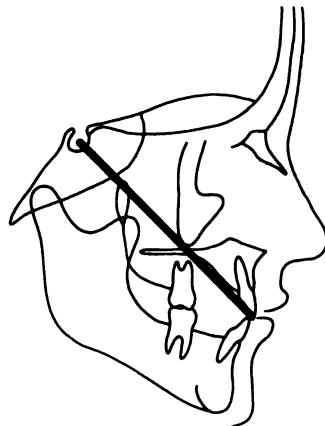
S-SD

35-8

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	89.9	4.0	**	6	25	86.5	4.1
7	44	91.1	4.2	**	7	31	87.7	4.3
8	44	92.3	4.3	**	8	36	88.7	4.5
9	47	94.1	4.3	**	9	31	90.1	5.0
10	46	96.7	4.4	**	10	35	92.7	4.9
11	43	99.1	3.8	**	11	30	94.1	4.7
12	44	100.1	4.6	**	12	27	95.9	4.5
13	43	102.5	5.0	**	13	29	97.0	4.0
14	40	103.9	5.3	**	14	25	97.8	4.1
15	33	105.5	6.0	**	15	19	99.0	4.6
16	23	109.1	5.9	**	16	9	100.6	6.4



LINEAR MEASUREMENT  
Variable 166

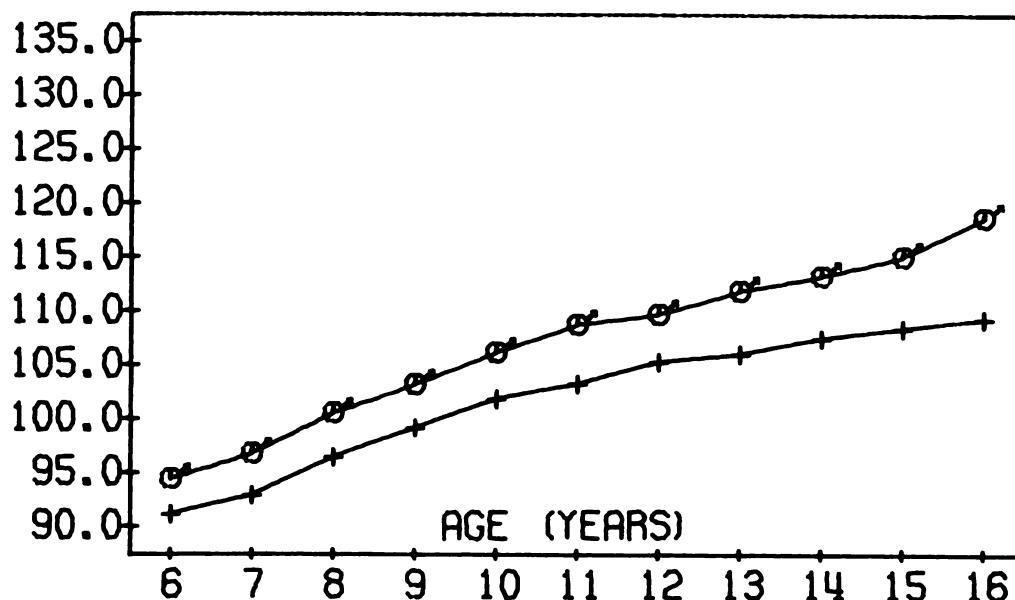


Sella-Upper Incisor Incisal  
Edge

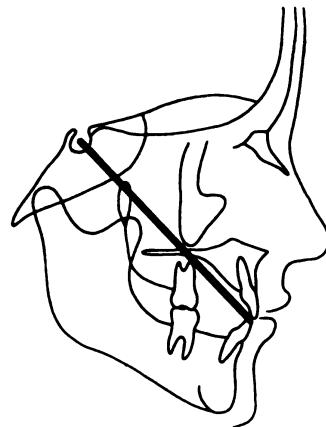
S-UIE

35-7

Age	N	Male		S.D.	Age	N	Female	
		Mean	mm				Mean	mm
6	37	94.5	4.3	**	6	25	91.1	4.1
7	44	96.9	4.6	**	7	31	92.9	4.9
8	44	100.6	4.9	**	8	36	96.4	5.3
9	47	103.3	4.7	**	9	31	99.2	5.0
10	46	106.2	4.5	**	10	35	101.9	4.9
11	43	108.8	4.0	**	11	30	103.3	4.7
12	44	109.8	4.7	**	12	27	105.3	4.4
13	43	111.9	5.2	**	13	29	106.1	4.0
14	40	113.4	5.6	**	14	25	107.5	4.1
15	33	115.1	6.2	**	15	19	108.4	5.0
16	23	118.7	5.8	**	16	9	109.3	5.9

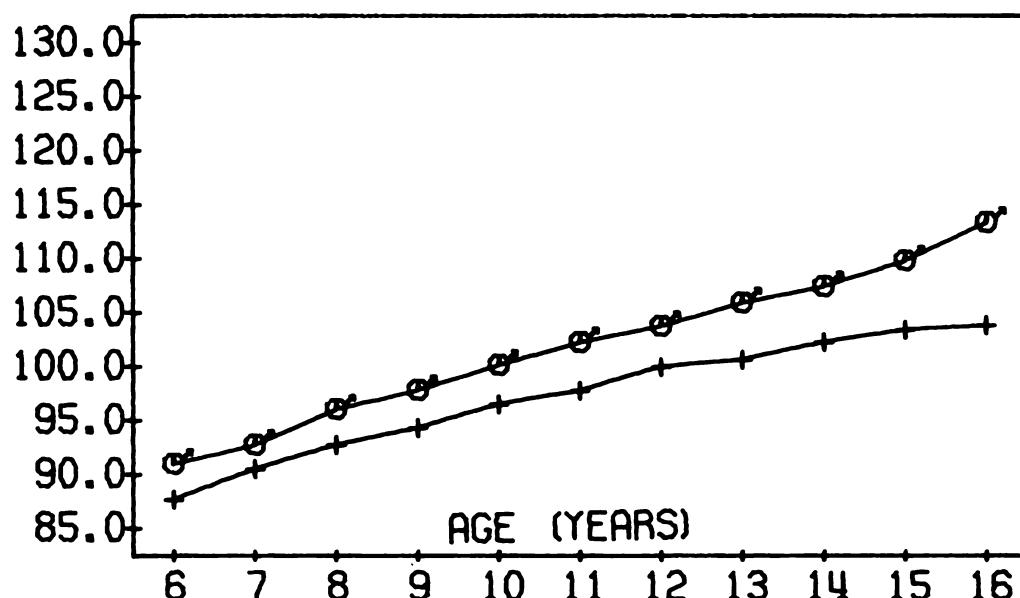


LINEAR MEASUREMENT  
Variable 167

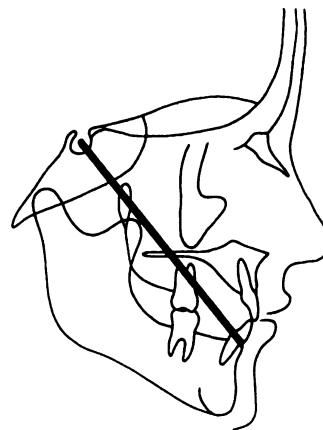


Sella-Lower Incisor Incisal  
Edge  
S-LIE                    35-6

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	91.1	4.9	**	6	25	87.6	4.1
7	44	92.8	4.3	*	7	31	90.5	4.8
8	44	96.1	4.2	**	8	36	92.7	4.6
9	46	97.9	4.1	**	9	31	94.3	4.8
10	45	100.2	4.3	**	10	35	96.5	5.0
11	43	102.3	4.8	**	11	30	97.7	4.4
12	44	103.8	4.9	**	12	27	100.0	4.4
13	43	106.0	5.2	**	13	29	100.6	3.8
14	40	107.5	5.6	**	14	25	102.2	4.0
15	33	109.8	6.1	**	15	19	103.4	4.8
16	23	113.4	6.4	**	16	9	103.8	6.7



LINEAR MEASUREMENT  
Variable 168

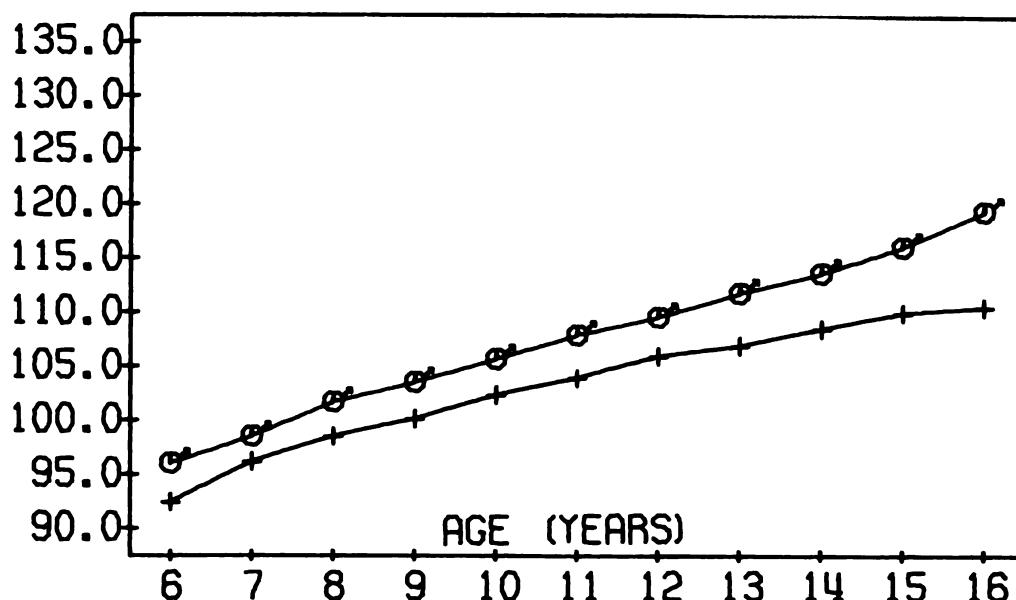


Sella-Infradentale

S-ID

35-5

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	96.1	5.1	**	6	25	92.4	4.2
7	44	98.6	4.3	*	7	31	96.2	4.6
8	44	101.7	4.0	**	8	36	98.5	4.1
9	46	103.6	3.9	**	9	31	100.1	4.2
10	45	105.7	4.1	**	10	35	102.3	4.5
11	43	107.9	4.5	**	11	30	103.9	4.0
12	44	109.6	4.6	**	12	27	105.9	4.2
13	43	111.8	5.1	**	13	29	106.9	3.7
14	40	113.6	5.4	**	14	25	108.4	3.6
15	33	116.0	5.8	**	15	19	109.9	4.5
16	23	119.3	6.2	**	16	9	110.4	5.1

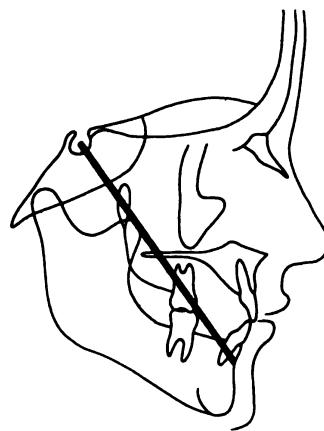


LINEAR MEASUREMENT  
Variable 169

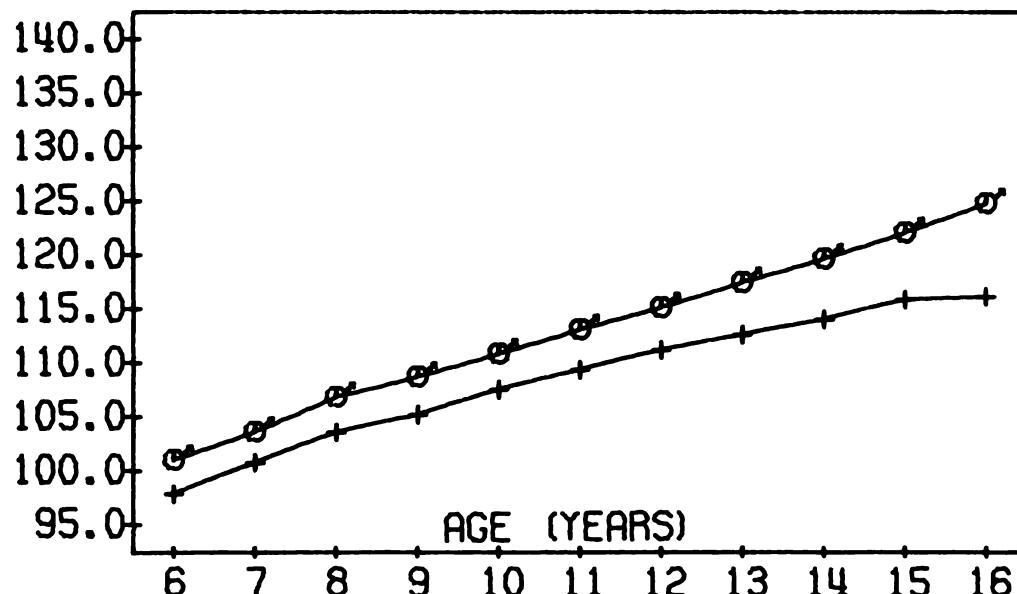
Sella-B Point

S-B

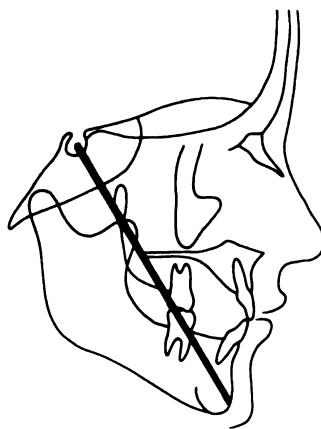
35-4



Age	N	Male		Age	N	Female		
		Mean mm	S.D. mm			Mean mm	S.D. mm	
6	37	101.1	5.2	**	6	25	97.9	4.8
7	44	103.7	4.5	**	7	31	100.8	4.5
8	44	106.9	4.2	**	8	36	103.6	4.3
9	46	108.8	4.1	**	9	31	105.2	4.3
10	45	110.9	4.2	**	10	35	107.5	5.0
11	43	113.2	4.5	**	11	30	109.4	4.6
12	44	115.2	4.6	**	12	27	111.2	4.4
13	43	117.5	5.3	**	13	29	112.6	4.0
14	40	119.7	5.7	**	14	25	114.0	3.9
15	33	122.1	5.6	**	15	19	115.9	4.5
16	23	124.8	6.2	**	16	9	116.1	4.2



LINEAR MEASUREMENT  
Variable 170

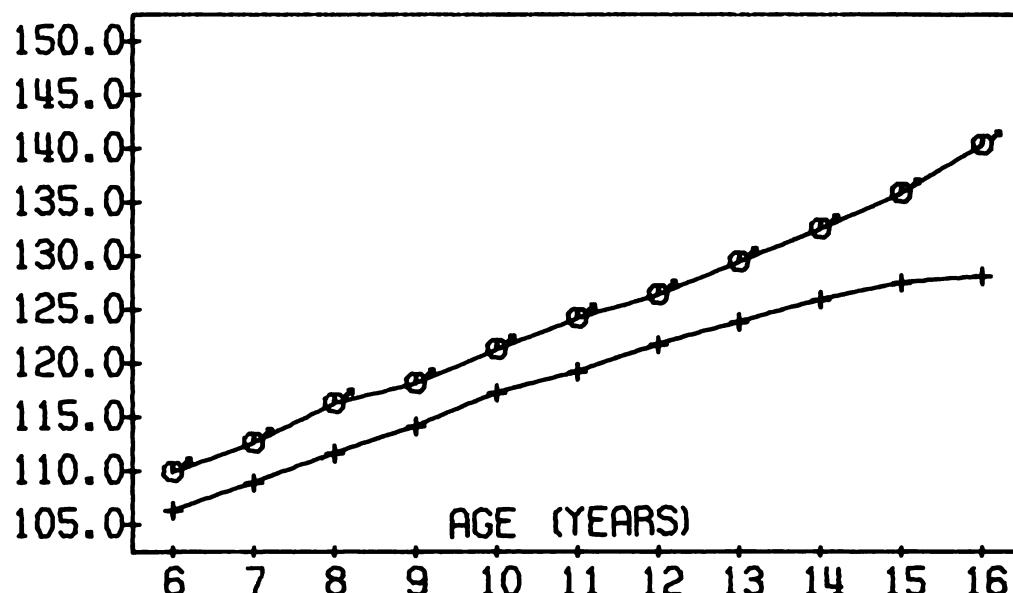


Sella-Pogonion

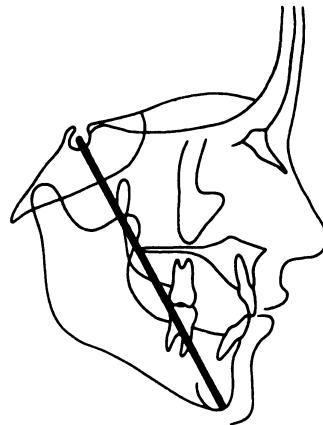
S-PG

35-3

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	109.9	5.5	6	25	106.3	5.4
7	44	112.7	4.6	7	31	108.9	5.3
8	44	116.3	4.3	8	36	111.6	5.6
9	46	118.2	4.3	9	31	114.1	5.6
10	45	121.3	4.8	10	35	117.2	5.5
11	43	124.3	5.0	11	30	119.2	5.7
12	44	126.4	5.2	12	27	121.8	5.1
13	43	129.5	6.4	13	29	123.8	4.4
14	40	132.6	6.7	14	25	125.9	4.8
15	33	135.9	6.6	15	19	127.5	5.9
16	23	140.4	6.9	16	9	128.1	4.7



LINEAR MEASUREMENT  
Variable 171

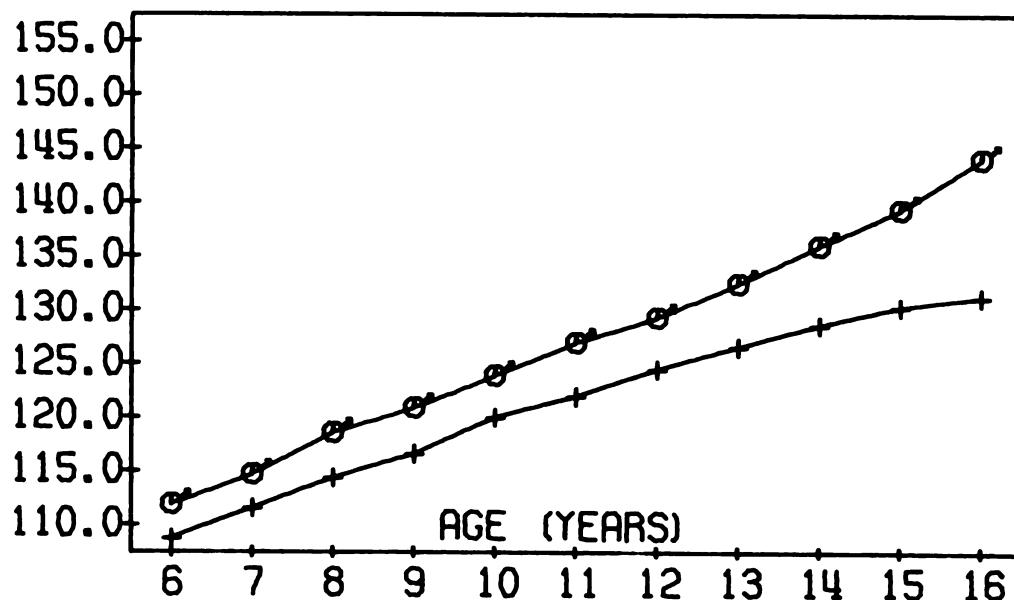


Sella-Gnathion

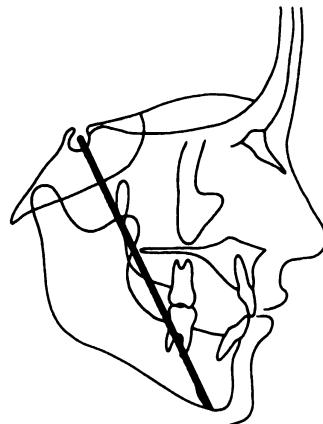
S-GN

35-2

Age	N	Male			Female			
		Mean mm	S.D. mm	Age	N	Mean mm	S.D. mm	
6	37	112.0	5.6	*	6	25	108.7	5.1
7	44	114.8	4.9	**	7	31	111.5	5.0
8	44	118.6	4.5	**	8	36	114.4	5.2
9	46	121.0	4.4	**	9	31	116.6	5.3
10	45	124.0	4.8	**	10	35	120.0	5.5
11	43	127.0	4.9	**	11	30	122.0	5.4
12	44	129.3	5.1	**	12	27	124.5	5.2
13	43	132.5	6.5	**	13	29	126.5	4.7
14	40	136.0	6.6	**	14	25	128.6	4.9
15	33	139.4	6.7	**	15	19	130.3	5.8
16	23	144.1	6.9	**	16	9	131.2	4.6



LINEAR MEASUREMENT  
Variable 172

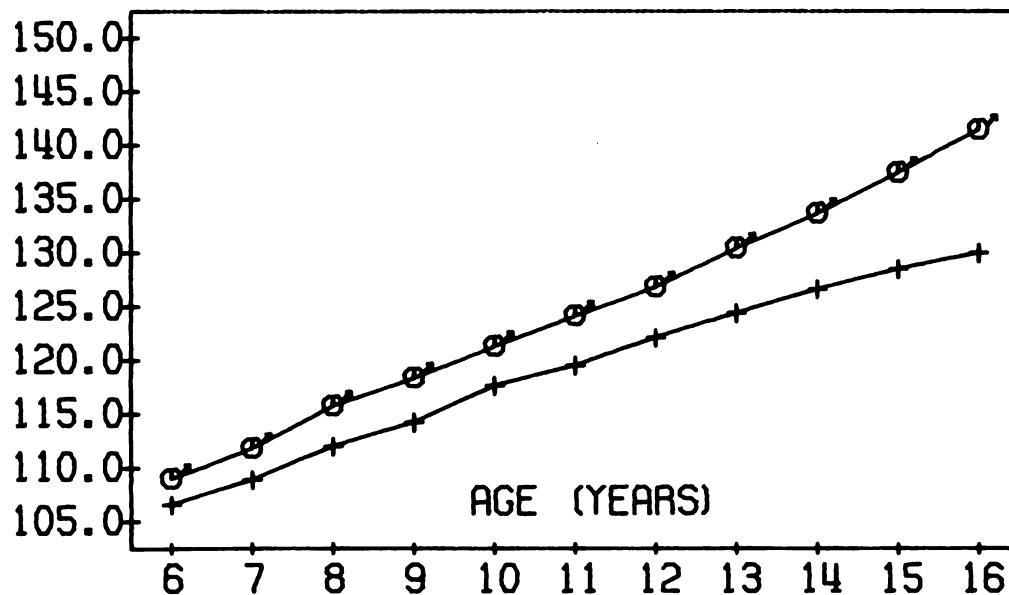


Sella-Menton

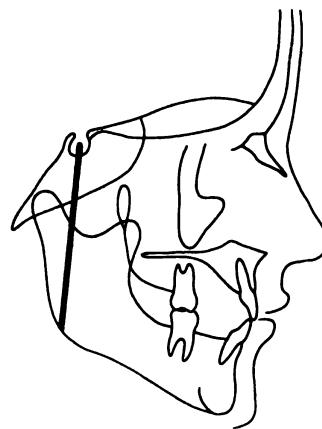
S-ME

35-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	109.1	5.6	6	25	106.6	4.9
7	44	111.9	4.9	7	31	108.9	5.1
8	44	115.8	4.5	8	36	112.0	5.1
9	46	118.4	4.5	9	31	114.2	4.9
10	45	121.3	4.8	10	35	117.6	5.3
11	43	124.2	5.3	11	30	119.5	5.0
12	44	126.9	5.4	12	27	122.1	5.1
13	42	130.5	6.7	13	29	124.4	4.8
14	39	133.7	6.7	14	25	126.6	5.3
15	32	137.5	6.7	15	19	128.5	5.8
16	23	141.5	6.7	16	9	129.9	4.2



LINEAR MEASUREMENT  
Variable 173

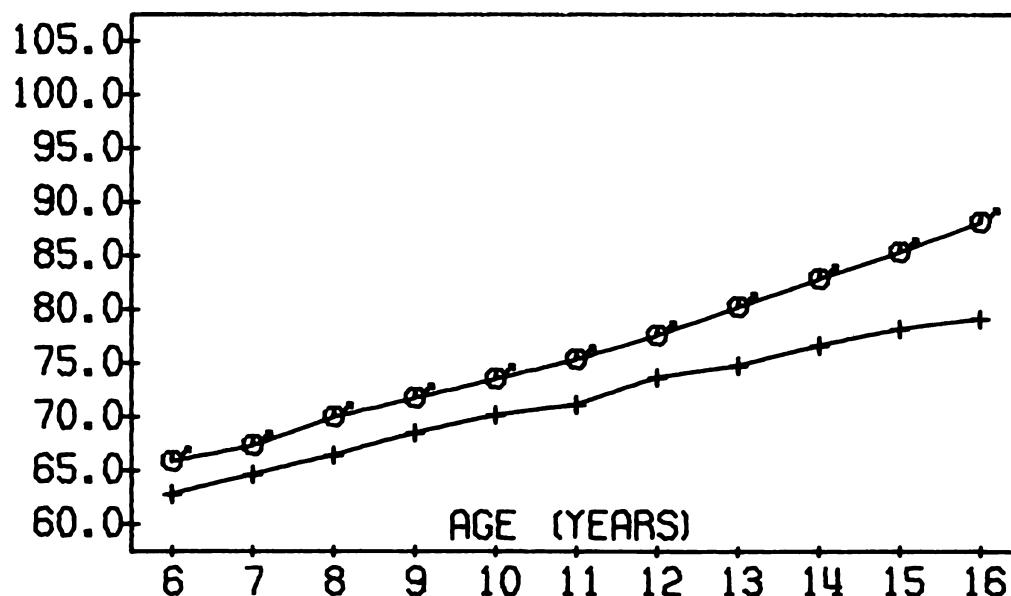


Sella-Gonion

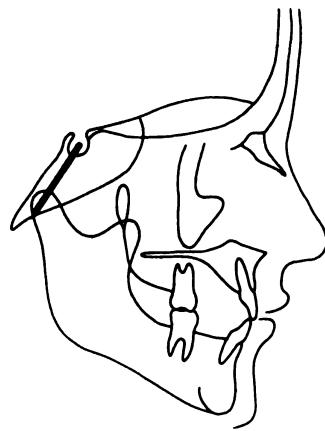
S-GO

35-27

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	65.9	4.7	6	25	62.8	4.3
7	44	67.4	4.6	7	31	64.6	4.4
8	44	70.0	4.3	8	36	66.4	4.0
9	46	71.9	4.4	9	31	68.5	4.4
10	45	73.6	4.6	10	35	70.2	4.1
11	43	75.4	4.9	11	30	71.1	4.4
12	44	77.6	5.3	12	27	73.7	5.1
13	43	80.3	6.1	13	29	74.8	4.4
14	40	82.9	5.6	14	25	76.6	5.5
15	33	85.4	5.6	15	19	78.2	5.1
16	23	88.2	5.9	16	9	79.1	4.3



LINEAR MEASUREMENT  
Variable 174

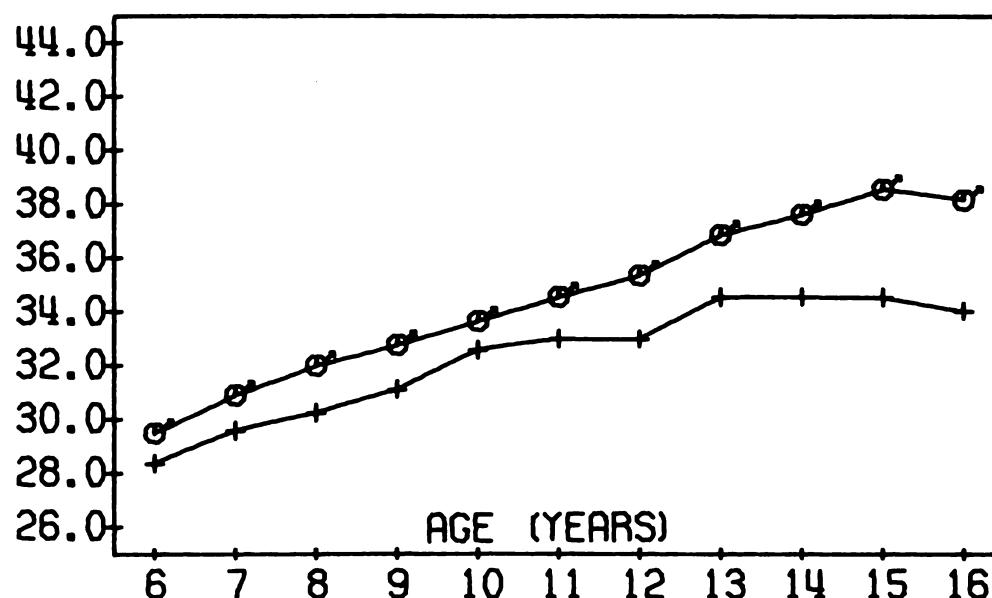


Sella-Articulare, Posterior

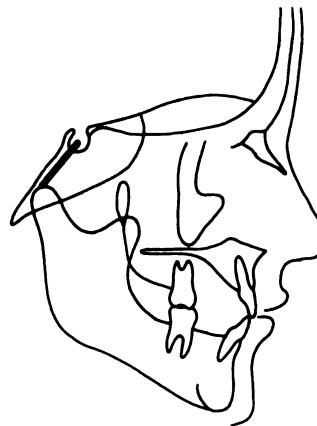
S-AR

35-31

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	29.5	2.8	6	25	28.4	3.1
7	44	30.9	2.8	7	31	29.6	3.1
8	44	32.0	3.0	8	36	30.2	3.4
9	46	32.8	2.6	9	31	31.1	3.2
10	45	33.7	3.1	10	35	32.6	3.4
11	43	34.6	3.0	11	30	33.0	3.7
12	44	35.4	3.3	12	27	33.0	3.4
13	43	36.9	3.5	13	29	34.6	3.8
14	40	37.6	3.3	14	25	34.6	3.7
15	33	38.6	3.4	15	19	34.6	4.0
16	23	38.2	3.1	16	9	34.0	2.9



LINEAR MEASUREMENT  
Variable 175

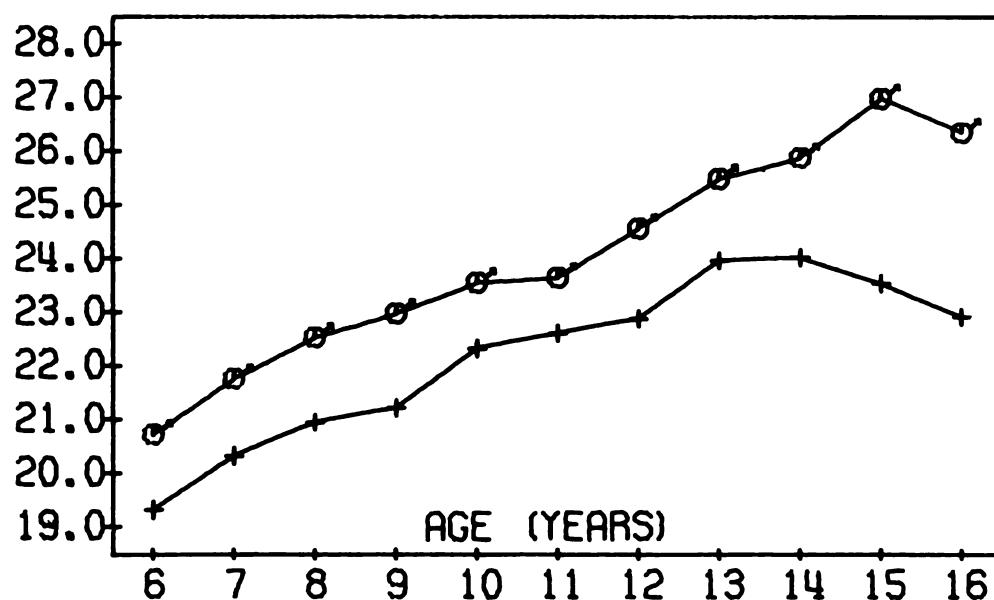


Sella-Condylion

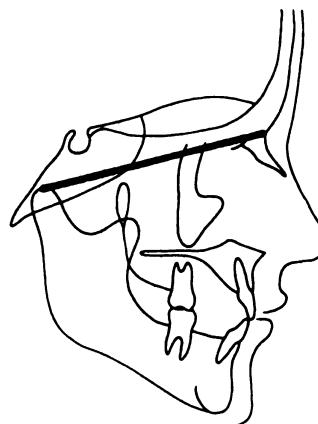
S-CO

35-33

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	20.7	2.4	6	25	19.3	3.5
7	44	21.8	2.6	7	31	20.3	3.6
8	44	22.5	2.9	8	36	21.0	3.8
9	46	23.0	2.5	9	31	21.2	4.0
10	45	23.6	2.7	10	35	22.3	4.0
11	43	23.6	2.9	11	30	22.6	4.2
12	44	24.6	2.8	12	27	22.9	3.6
13	43	25.5	3.2	13	29	24.0	4.4
14	40	25.9	3.2	14	25	24.0	4.0
15	33	27.0	3.1	15	19	23.5	4.6
16	23	26.3	3.1	16	9	22.9	2.7



LINEAR MEASUREMENT  
Variable 176

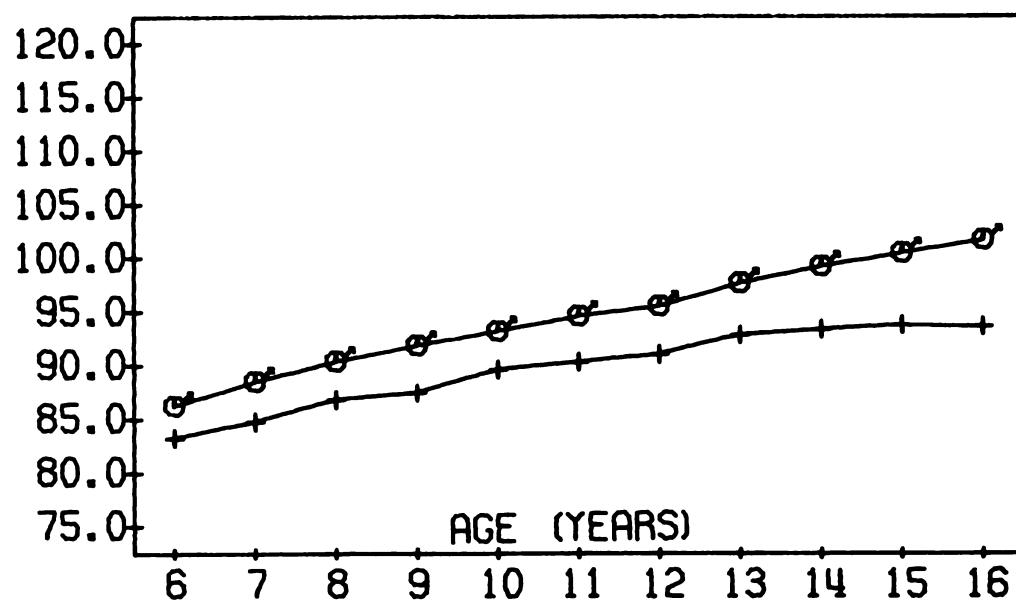


Nasion-Condylion

N-CO

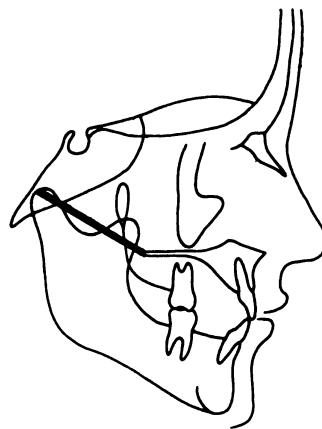
38-33

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	86.3	3.6	**	6	25	83.2	3.7
7	44	88.6	3.7	**	7	31	84.8	4.0
8	44	90.5	4.0	**	8	36	86.9	4.4
9	46	91.9	3.7	**	9	31	87.5	4.3
10	45	93.3	3.9	**	10	35	89.6	4.5
11	43	94.7	3.7	**	11	30	90.3	4.8
12	44	95.6	4.0	**	12	27	91.1	4.4
13	43	97.7	4.7	**	13	29	92.8	4.1
14	40	99.2	4.5	**	14	25	93.3	4.4
15	33	100.5	3.3	**	15	19	93.7	4.8
16	23	101.7	4.3	**	16	9	93.6	4.2

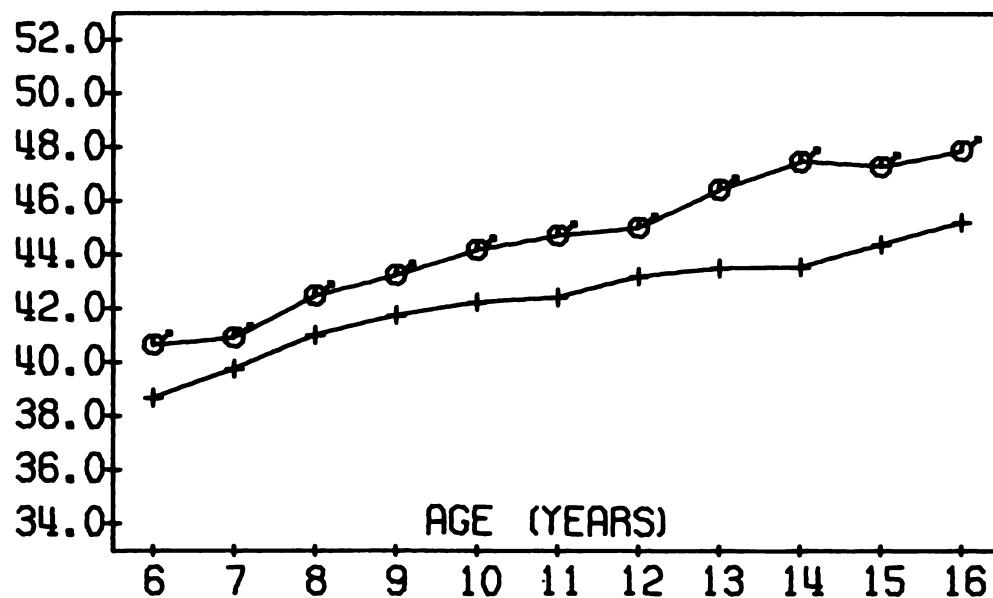


**LINEAR MEASUREMENT**  
**Variable 177**

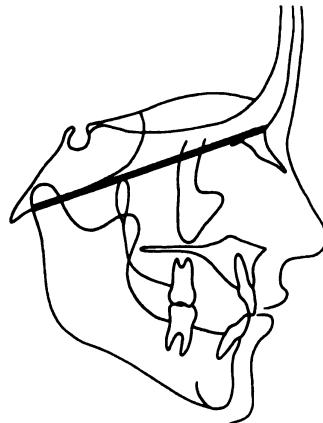
**Condylion-Posterior Nasal Spine**  
**CO-PNS**      **33-45**



Age	N	Male		S.D.	**	Age	N	Female	
		Mean	mm					Mean	mm
6	37	40.7	2.8		**	6	24	38.7	2.1
7	44	40.9	2.7			7	31	39.8	2.5
8	44	42.5	2.6		**	8	36	41.0	2.7
9	46	43.3	3.0	*		9	31	41.8	3.1
10	45	44.2	3.0		**	10	35	42.2	2.7
11	43	44.7	3.0		**	11	30	42.4	2.4
12	44	45.0	2.8		**	12	27	43.2	2.7
13	43	46.4	3.3		**	13	29	43.5	2.3
14	39	47.5	3.5		**	14	25	43.6	2.3
15	33	47.3	3.0		**	15	19	44.4	2.7
16	23	47.9	2.6		**	16	9	45.2	2.6



**LINEAR MEASUREMENT  
Variable 178**

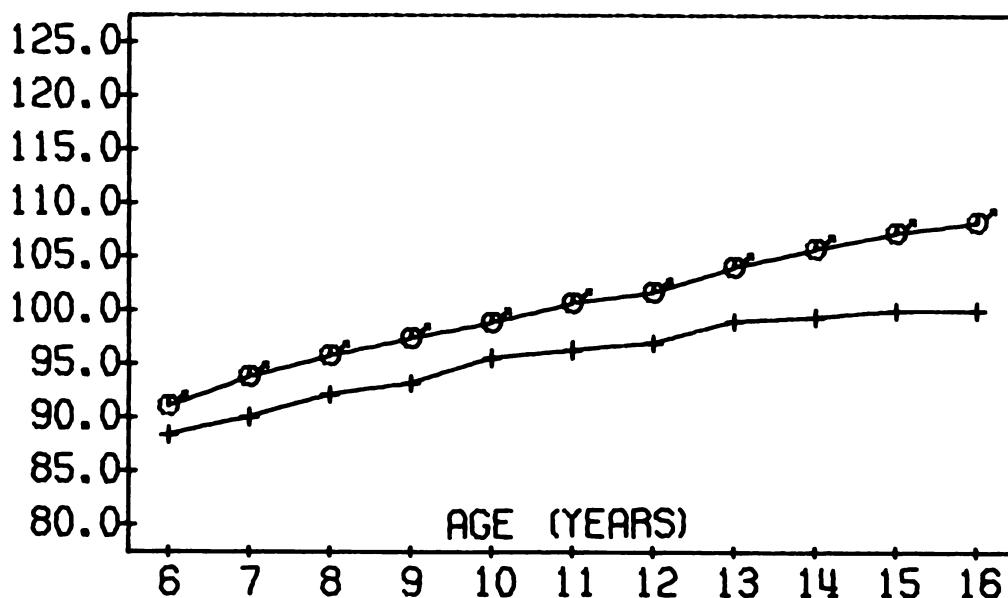


**Nasion-Articulare, Posterior**

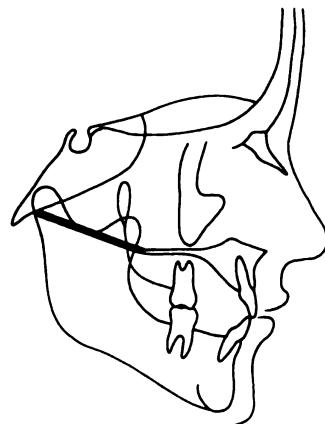
**N-AR**

**38-31**

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	91.1	3.6	**	6	25	88.4	4.0
7	44	93.9	4.0	**	7	31	90.1	4.2
8	44	95.8	4.0	**	8	36	92.2	4.5
9	46	97.4	3.8	**	9	31	93.2	4.3
10	45	98.9	3.9	**	10	35	95.6	4.5
11	43	100.8	3.8	**	11	30	96.3	4.7
12	44	101.7	3.8	**	12	27	97.0	4.3
13	43	104.1	4.7	**	13	29	99.0	4.1
14	40	105.8	4.6	**	14	25	99.4	4.5
15	33	107.3	3.5	**	15	19	100.0	4.6
16	23	108.3	4.2	**	16	9	100.0	4.0



LINEAR MEASUREMENT  
Variable 179

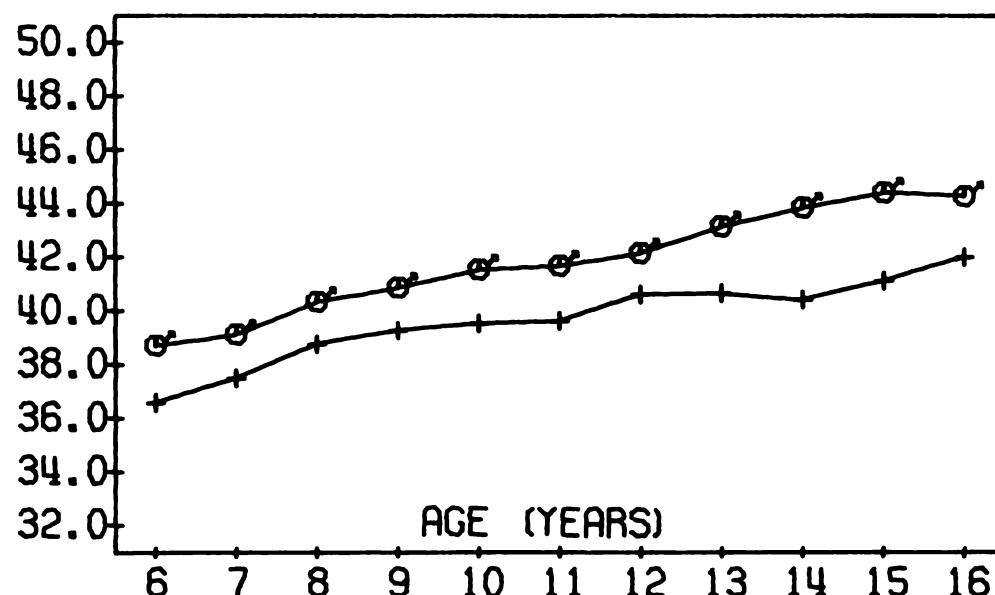


Articulare, Posterior-  
Posterior Nasal Spine

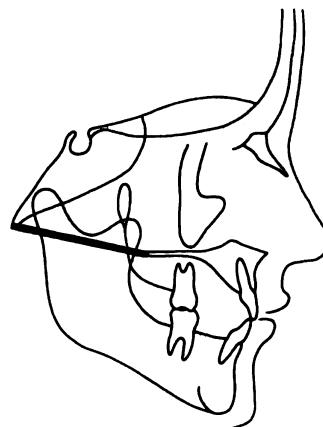
AR-PNS

31-45

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	38.7	2.5	**	6	24	36.6	2.7
7	44	39.1	2.7	**	7	31	37.5	2.9
8	44	40.4	2.5	**	8	36	38.8	2.9
9	46	40.9	2.8	**	9	31	39.3	3.1
10	45	41.5	2.8	**	10	35	39.5	3.0
11	43	41.7	2.8	**	11	30	39.6	2.6
12	44	42.2	2.7	*	12	27	40.6	2.8
13	43	43.2	3.0	**	13	29	40.7	2.7
14	39	43.9	3.5	**	14	25	40.4	3.3
15	33	44.4	2.7	**	15	19	41.1	3.4
16	23	44.3	2.4	*	16	9	42.0	3.3



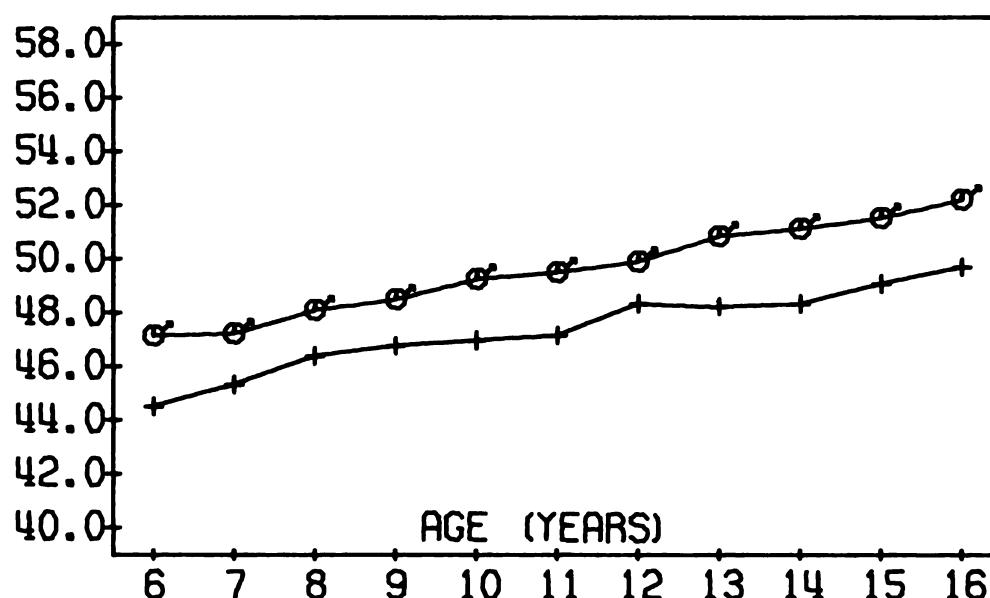
LINEAR MEASUREMENT  
Variable 180



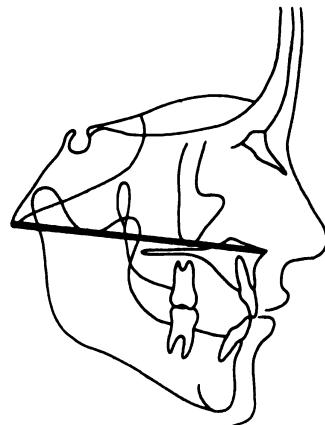
Basion-Posterior Nasal Spine

BA-PNS      30-45

Age	N	Male			Age	N	Female		
		Mean mm	S.D. mm	**			Mean mm	S.D. mm	
6	37	47.2	2.8	**	6	24	44.5	3.4	
7	44	47.2	3.2	**	7	31	45.3	3.4	
8	44	48.1	2.8	**	8	36	46.4	3.5	
9	47	48.5	3.4	*	9	31	46.8	3.9	
10	46	49.3	3.5	**	10	35	47.0	3.3	
11	43	49.5	3.6	**	11	30	47.2	3.2	
12	44	49.9	3.8		12	27	48.3	3.6	
13	43	50.9	4.0	**	13	29	48.2	3.6	
14	39	51.2	4.5	**	14	25	48.3	3.7	
15	33	51.6	4.0	*	15	19	49.1	3.6	
16	23	52.2	3.4	*	16	9	49.7	4.5	



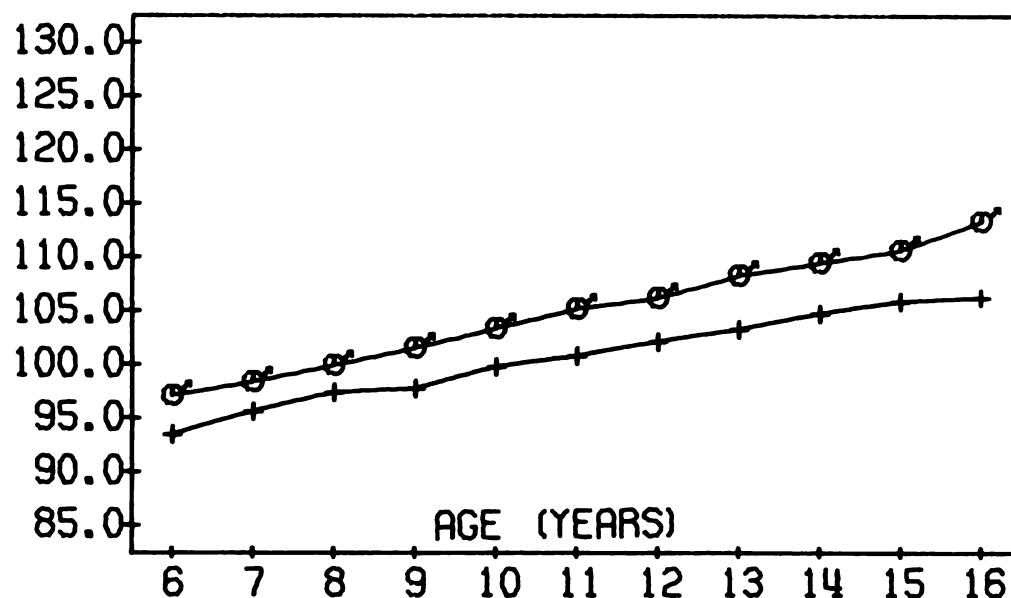
LINEAR MEASUREMENT  
Variable 181



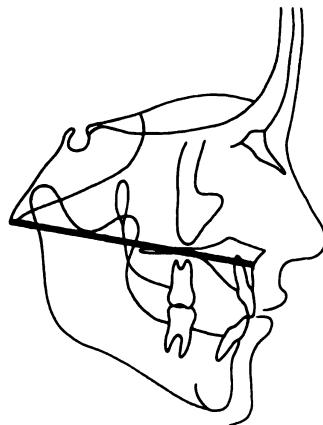
Basion-Anterior Nasal Spine

BA-ANS      30-10

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	97.2	4.1	**	6	25	93.5	4.1
7	44	98.5	4.3	**	7	31	95.6	4.5
8	44	100.0	3.8	**	8	36	97.4	4.9
9	47	101.6	4.2	**	9	31	97.8	4.7
10	46	103.4	4.2	**	10	35	99.8	5.1
11	43	105.3	4.3	**	11	30	100.8	5.3
12	44	106.3	4.9	**	12	27	102.1	4.6
13	43	108.4	5.0	**	13	29	103.3	5.0
14	40	109.5	5.5	**	14	25	104.8	5.2
15	33	110.7	5.0	**	15	19	105.9	5.1
16	23	113.4	5.1	**	16	9	106.2	7.8



LINEAR MEASUREMENT  
Variable 182

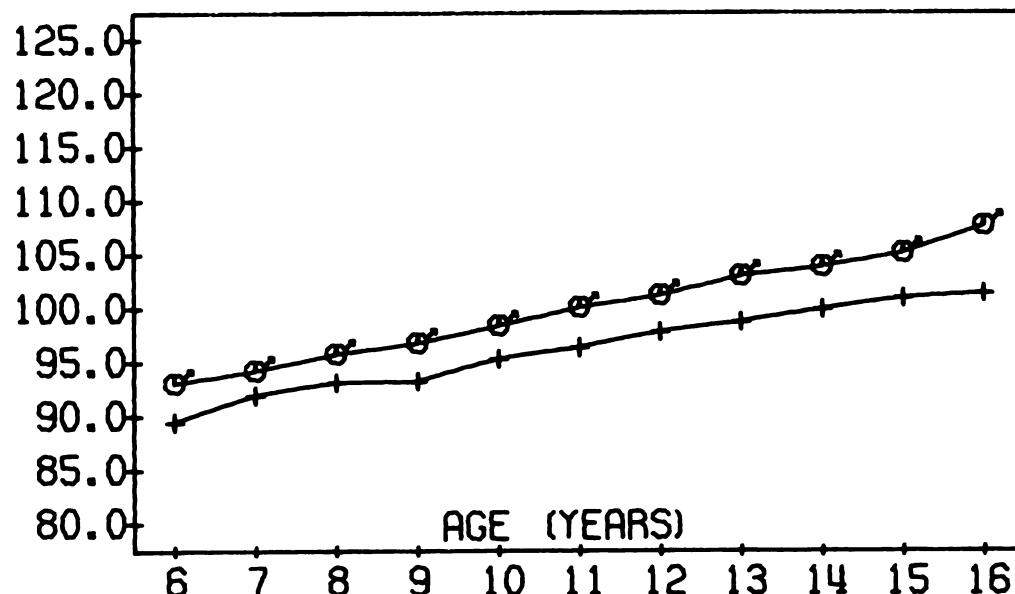


Basion-A Point

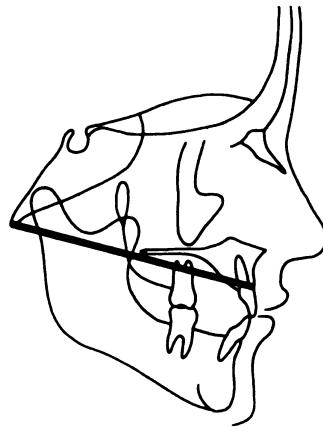
BA-A

30-9

Age	N	Male		S.D.	Age	N	Female		S.D.
		Mean	mm				Mean	mm	
6	37	93.1	3.9	**	6	25	89.5	4.3	
7	44	94.3	4.2	*	7	31	92.0	4.5	
8	44	95.8	3.8	**	8	36	93.2	5.0	
9	47	96.8	4.3	**	9	31	93.2	5.0	
10	46	98.5	4.2	**	10	35	95.3	5.4	
11	43	100.2	4.1	**	11	30	96.4	5.0	
12	44	101.3	5.0	**	12	27	97.8	4.8	
13	43	103.1	5.1	**	13	29	98.7	5.3	
14	40	103.9	5.5	**	14	25	99.9	5.1	
15	33	105.2	5.0	**	15	19	101.0	5.0	
16	23	107.8	5.2	**	16	9	101.4	7.5	



LINEAR MEASUREMENT  
Variable 183

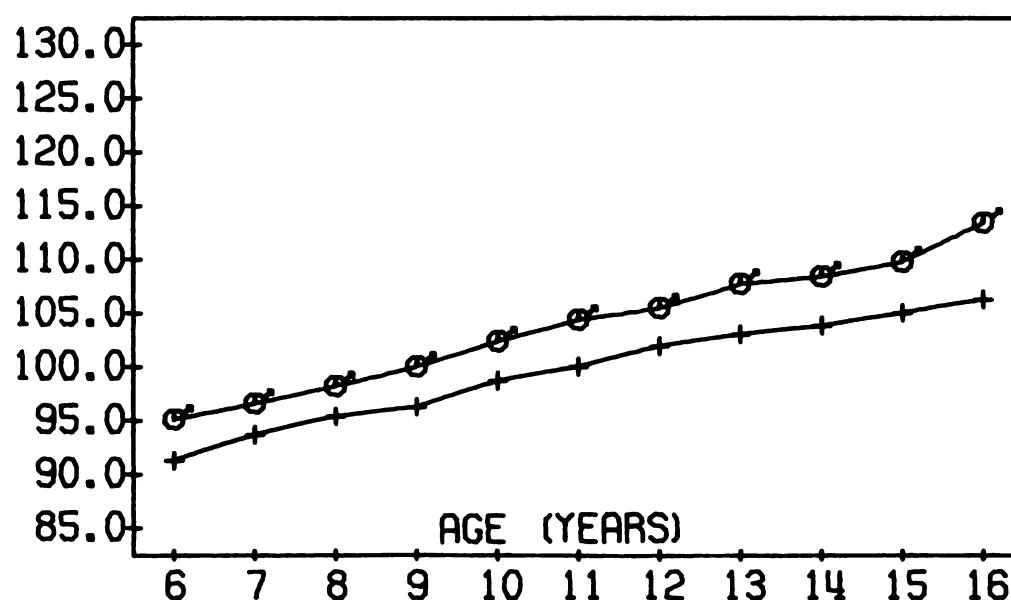


Basion-Supradentale

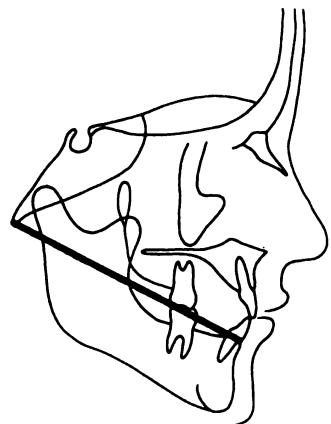
BA-SD

30-8

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	95.2	3.9	**	6	25	91.3	4.7
7	44	96.7	4.3	**	7	31	93.7	4.7
8	44	98.3	4.3	**	8	36	95.5	5.1
9	47	100.1	4.5	**	9	31	96.3	5.4
10	46	102.5	4.6	**	10	35	98.7	5.7
11	43	104.4	4.5	**	11	30	100.0	5.3
12	44	105.5	5.3	**	12	27	101.9	5.2
13	43	107.8	5.4	**	13	29	103.1	5.4
14	40	108.5	5.7	**	14	25	103.9	5.4
15	33	109.9	5.4	**	15	19	105.1	5.4
16	23	113.5	5.4	**	16	9	106.3	8.1

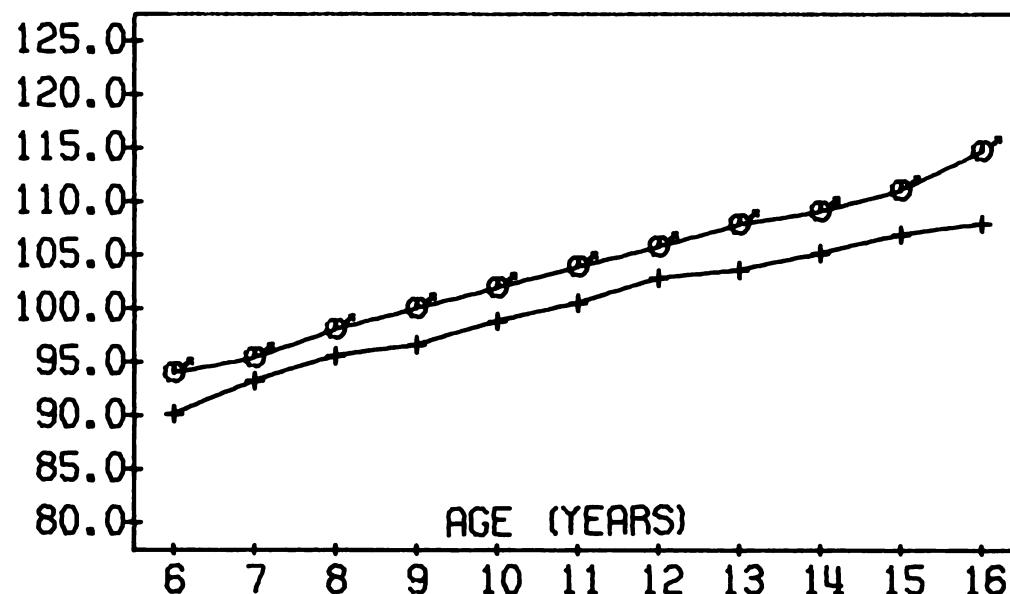


LINEAR MEASUREMENT  
Variable 184

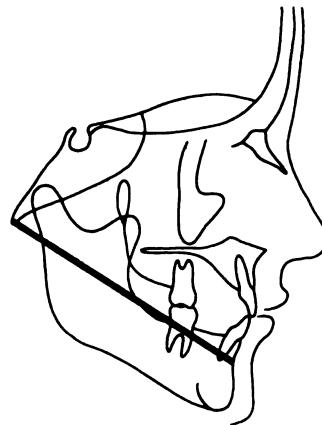


Basion-Infradentale  
BA-ID            30-5

Age	N	Male			Age	N	Female	
		Mean mm	S.D. mm	**			Mean mm	S.D. mm
6	37	94.1	3.7	**	6	25	90.2	5.1
7	44	95.5	3.6	*	7	31	93.3	5.1
8	44	98.2	3.7	**	8	36	95.6	5.0
9	46	100.1	4.1	**	9	31	96.6	5.3
10	45	102.0	3.9	**	10	35	98.8	5.4
11	43	104.0	4.4	**	11	30	100.5	5.1
12	44	105.9	5.0	**	12	27	102.9	5.2
13	43	108.0	4.9	**	13	29	103.6	5.5
14	40	109.2	5.4	**	14	25	105.2	5.6
15	33	111.1	4.8	**	15	19	106.9	5.8
16	23	114.8	5.4	**	16	9	107.9	7.6



LINEAR MEASUREMENT  
Variable 185

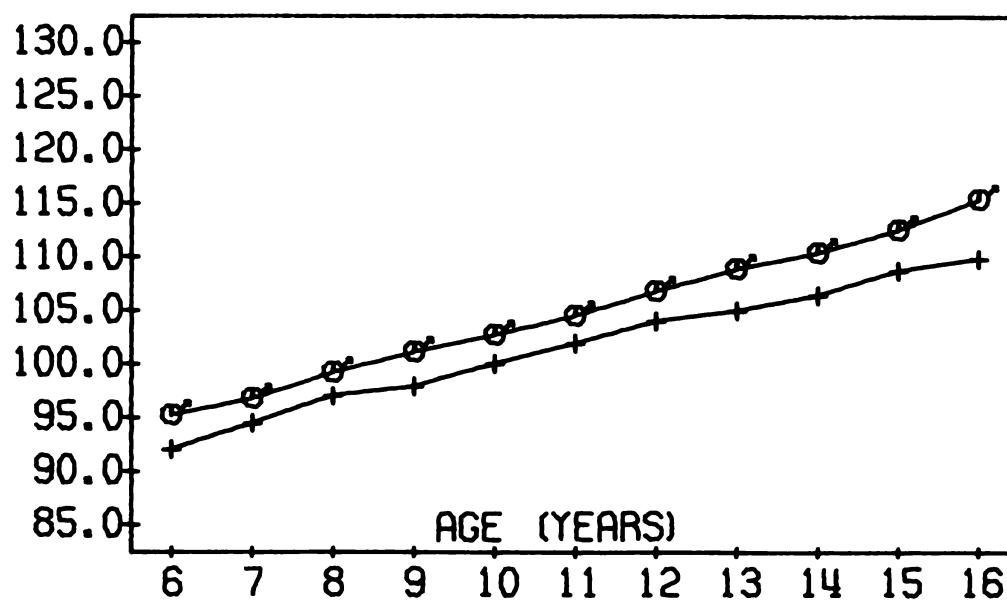


Basion-B Point

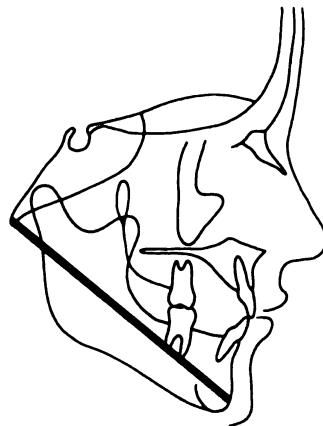
BA-B

30-4

Age	N	Male			Age	N	Female	
		Mean	S.D.				Mean	S.D.
6	37	95.3	3.5	**	6	25	92.1	5.3
7	44	96.9	3.6	**	7	31	94.5	5.0
8	44	99.4	3.7	*	8	36	97.1	5.1
9	46	101.3	3.9	**	9	31	98.0	5.1
10	45	102.8	3.8	**	10	35	100.1	5.4
11	43	104.6	4.0	**	11	30	102.0	5.4
12	44	106.9	4.7	**	12	27	104.0	5.1
13	43	109.0	4.7	**	13	29	105.0	5.9
14	40	110.5	5.3	**	14	25	106.5	5.7
15	33	112.6	4.5	**	15	19	108.8	6.1
16	23	115.5	5.2	**	16	9	109.9	6.6



LINEAR MEASUREMENT  
Variable 186

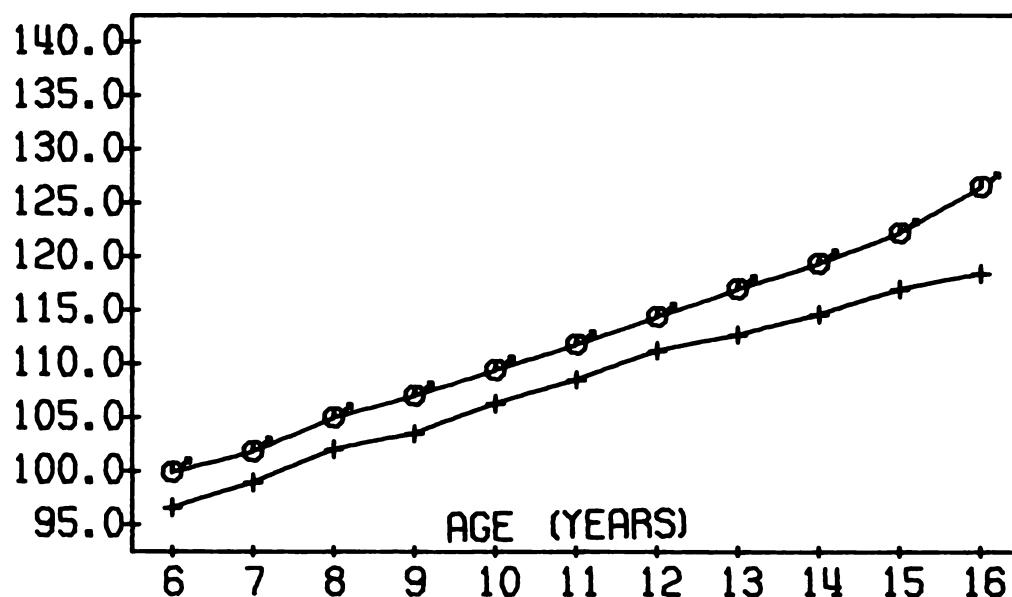


Basion-Pogonion

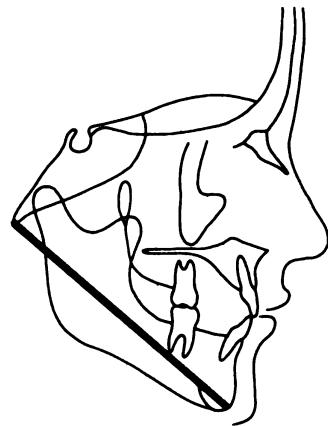
BA-PG

30-3

Age	N	Male		S.D.	Age	N	Female	
		Mean mm	S.D. mm				Mean mm	S.D. mm
6	37	99.9	3.7	**	6	25	96.6	5.7
7	44	101.9	3.5	**	7	31	99.0	5.3
8	44	105.0	3.6	**	8	36	102.0	5.8
9	46	107.1	3.8	**	9	31	103.5	5.8
10	45	109.4	3.8	**	10	35	106.3	5.7
11	43	111.8	4.2	**	11	30	108.5	5.9
12	44	114.4	4.7	**	12	27	111.2	5.7
13	43	117.0	5.4	**	13	29	112.7	5.8
14	40	119.4	5.5	**	14	25	114.6	5.9
15	33	122.2	4.4	**	15	19	117.0	6.4
16	23	126.5	5.1	**	16	9	118.4	6.2



LINEAR MEASUREMENT  
Variable 187

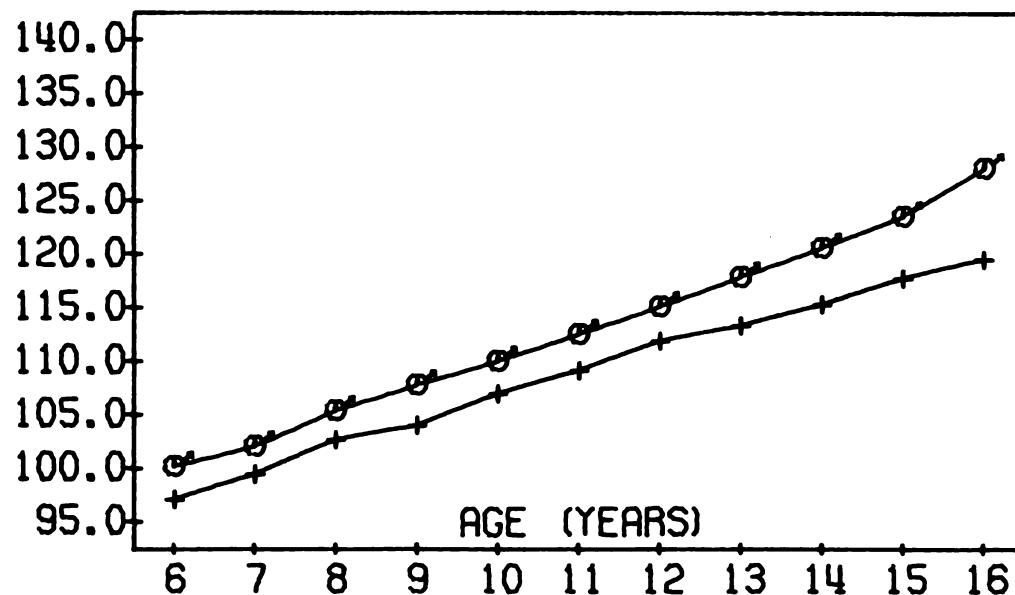


Basion-Gnathion

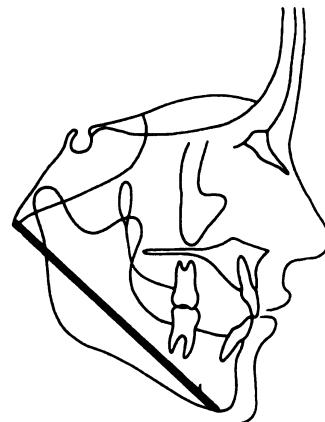
BA-GN

30-2

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	100.2	3.9	6	25	97.1	5.8
7	44	102.1	3.6	7	31	99.5	5.3
8	44	105.5	3.6	8	36	102.7	5.7
9	46	107.9	3.7	9	31	104.0	5.8
10	45	110.1	3.8	10	35	107.0	5.8
11	43	112.6	3.9	11	30	109.1	5.9
12	44	115.2	4.4	12	27	111.9	5.9
13	43	117.9	5.4	13	29	113.3	6.2
14	40	120.7	5.4	14	25	115.3	6.3
15	33	123.6	4.3	15	19	117.7	6.4
16	23	128.1	4.8	16	9	119.6	6.4



LINEAR MEASUREMENT  
Variable 188

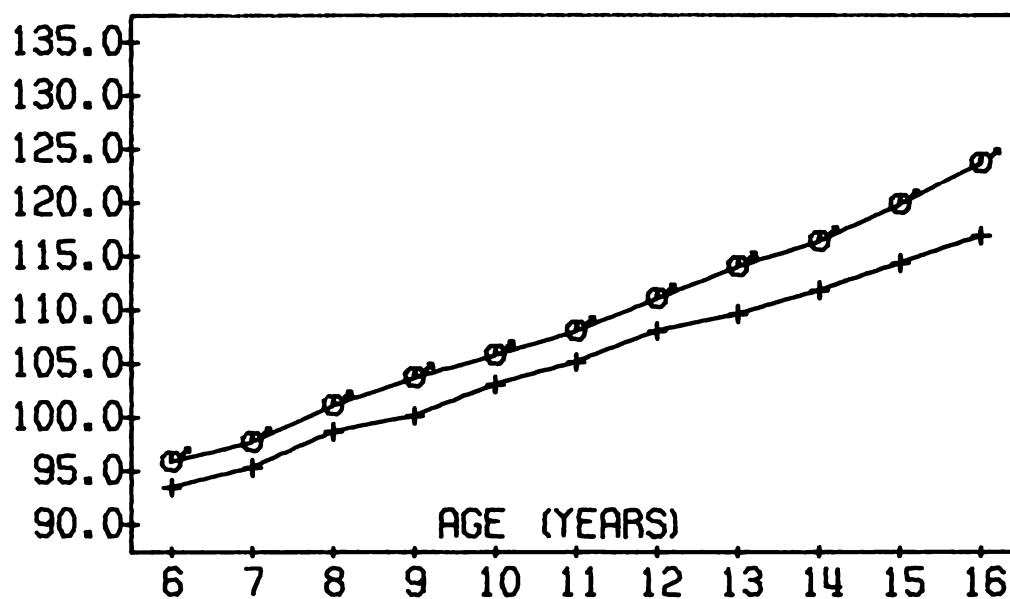


Basion-Menton

BA-ME

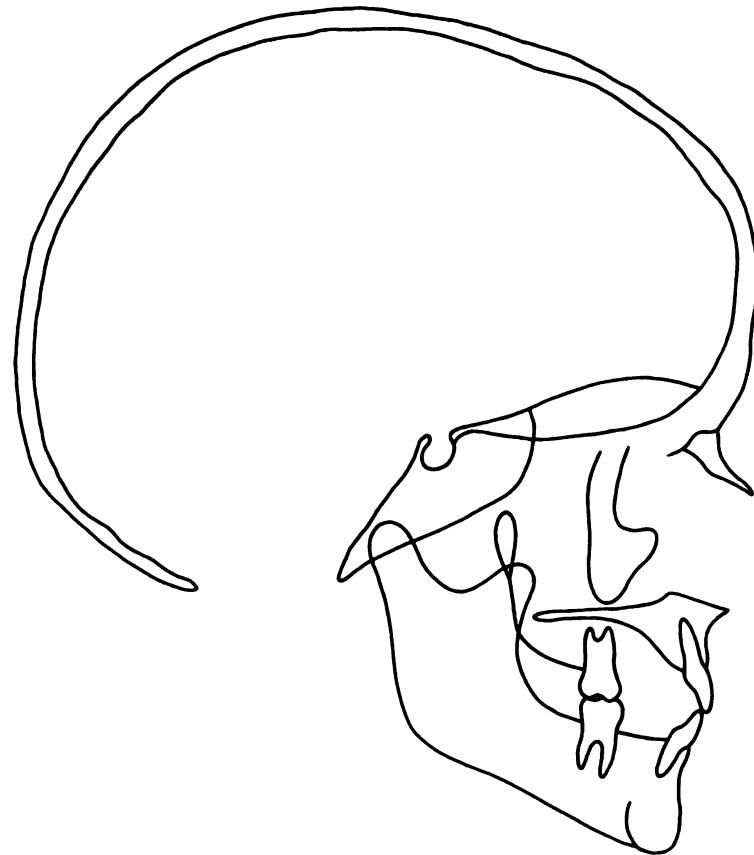
30-1

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	96.0	4.2	6	25	93.5	5.6
7	44	97.8	3.8	*	7	31	95.4
8	44	101.2	4.0	*	8	36	98.7
9	46	103.8	4.3	**	9	31	100.2
10	45	105.9	4.0	**	10	35	103.1
11	43	108.1	4.6	**	11	30	105.2
12	44	111.1	5.0	**	12	27	108.1
13	42	114.1	5.7	**	13	29	109.6
14	39	116.4	5.9	**	14	25	111.9
15	32	119.9	4.6	**	15	19	114.4
16	23	123.7	5.0	**	16	9	116.9









## CEPHALOMETRIC VARIABLES BY AGE

219



## AGE 6

### ANGULAR MEASUREMENTS

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
1	S-N-Ant Nasal Spine	87.2	3.8	85.9	3.3
2	S-N-A Point	81.9	3.3	80.7	3.0
3	S-N-B Point	76.5	2.6	76.0	3.5
4	A Point-N-B Point	5.3	2.2	4.7	2.2
5	S-N-Pogonion	76.0	2.4	75.6	3.6
6	S-N/N-Gnathion	74.8	2.4	74.4	3.7
7	S-N/Frankfort P1	6.1	3.0	6.5	4.7
8	S-N/Condylar P1	6.8	2.2	7.5	3.9
9	S-N/Palatal P1	5.2	2.4	7.0	2.6
10	S-N/Funct Occl P1	19.0	4.7	20.6	5.1
11	S-N/Downs Occl P1	19.0	4.6	20.6	4.8
12	S-N/Gonion-Gnathion	34.8	3.8	35.8	5.5
13	S-N/Mandibular P1	35.4	4.0	36.5	5.7
14	S-N/Go Int-Art Post	83.4	3.8	86.7	4.2
15	S-N/S-Gnathion	66.3	2.6	67.1	3.7
16	S-N/PM Vert	104.9	4.3	107.1	4.3
17	S-N-Basion	129.3	5.0	129.6	5.0

AGE 12

## ANGULAR MEASUREMENTS (cont.)

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
18	Fra P1/N-ANS	92.0	4.3	94.0	2.7
19	Fra P1/N-A Point	85.8	4.2	88.7	2.4
20	Fra P1/N-B Point	81.9	3.9	84.2	2.6
21	Fra P1/N-Pogonion	82.6	3.8	85.0	3.0
22	Fra P1/Condylar P1	-2.0	3.2	-1.5	2.8
23	Fra P1/PM Vert	99.4	5.2	101.3	5.3
24	Fra P1/Funct Occ1 P1	13.2	5.3	11.6	3.6
25	Fra P1/Downs Occ1 P1	11.4	4.8	9.4	3.0
26	Fra P1/Mand P1	29.4	5.5	28.1	5.2
27	Fra P1/Go Int-Art Post	82.7	5.1	81.0	3.2
28	Fra P1/Sella-Gnathion	62.2	4.5	60.5	3.8
29	Cond P1/N-ANS	94.0	3.7	93.6	4.2
30	Cond P1/N-A Point	88.4	3.5	88.5	3.8
31	Cond P1/N-B Point	84.5	3.3	84.8	3.0
32	Cond P1/Funct Occ1 P1	10.7	4.1	10.4	3.3
33	Cond P1/Downs Occ1 P1	9.0	3.7	9.1	3.2
34	Cond P1/Mand P1	26.6	4.7	27.0	4.5
35	Cond P1/Go Int-Art Post	80.1	4.2	80.8	3.8
36	Cond P1/Sella-Gnathion	59.9	3.1	59.9	3.6
37	Cond P1/PM Vert	97.1	4.6	99.6	4.5

AGE 12

## ANGULAR MEASUREMENTS (cont.)

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
38	Pa1 P1/N-ANS	93.2	3.4	94.7	2.6
39	Pa1 P1/N-A Point	87.7	3.5	89.7	2.8
40	Pa1 P1/N-B Point	83.8	2.8	85.9	3.0
41	Pa1 P1/N-Pogonion	84.4	2.8	86.6	3.0
42	Pa1 P1/Funct Occ1 P1	11.4	4.0	9.3	3.8
43	Pa1 P1/Downs Occ1 P1	9.7	2.9	8.0	2.8
44	Pa1 P1/Mand P1	27.3	4.9	25.8	5.1
45	PM Vert/Pa1 P1	82.1	3.7	81.6	4.3
46	PM Vert/Funct Occ1 P1	93.5	5.4	90.8	5.1
47	PM Vert/Downs Occ1 P1	91.9	4.6	89.6	4.8
48	PM Vert/Mand P1	109.5	6.4	107.4	6.3
49	Mand P1/N-Pogonion	68.2	3.7	67.5	2.9
50	Mand PL/Art Post	126.5	5.2	126.2	4.2
51	A Pt-B Pt/N-Pogonion	-6.1	2.7	-5.9	3.6
52	N-A Point-Pogonion	6.7	4.8	6.4	5.5
74	S-Gnathion/N-Basion	4.4	3.5	4.9	3.7
73.1	A-B/Funct Occ1 P1	90.3	3.8	90.1	4.3

AGE 11

## ANGULAR MEASUREMENTS (cont.)

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
53	Up Inc/S-N	104.6	5.7	105.1	6.9
54	Up Inc/Fra P1	110.3	7.3	112.5	6.8
55	Up Inc/Cond P1	112.1	6.2	112.3	7.1
56	Up Inc/Pal P1	111.1	5.7	112.8	7.0
57	Up Inc/Funct Occ1 P1	56.0	6.1	57.0	7.8
58	Up Inc/Downs Occ1 P1	58.4	5.7	58.4	5.8
59	Up Inc/Mand P1	40.7	7.0	40.1	6.0
✓60	Up Inc/N-A Point	23.8	6.0	24.0	6.1
✓61	Low Inc/Up Inc	124.9	9.1	126.9	9.1
62	Low Inc/S-N	49.5	6.7	52.0	7.3
✓63	Low Inc/Fra P1	55.2	6.8	58.0	5.7
64	Low Inc/Pal P1	56.0	6.3	59.7	7.4
65	Low Inc/Cond P1	57.0	6.5	59.2	6.2
66	Low Inc/Funct Occ1 P1	68.9	5.9	69.9	6.3
67	Low Inc/Downs Occ1 P1	66.5	5.6	68.5	6.4
68	Low Inc/Downs Occ1 P1	23.5	5.6	21.5	6.4
69	Low Inc/Gonion-Gnathion	96.2	5.3	93.4	5.8
70	Low Inc/Mand P1 (-90deg)	5.8	5.4	3.3	6.0
✓71	Low Inc/Mand P1	95.8	5.4	93.3	6.0
72	Low Inc/A Pt-Pogonion	23.8	4.5	22.5	5.1
✓73	Low Inc/N-B Point	27.0	6.0	25.3	6.0

AGE 10

## LINEAR MEASUREMENTS

## I. Mandibular Region

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
75	Cond-Low Inc Edge	97.9	4.0	94.5	4.9
76	Cond-Infradentale	101.0	3.7	98.0	4.4
77	Cond-B Point	104.1	3.7	101.3	4.5
78	Cond-Pogonion	112.8	4.0	109.5	4.9
79	Cond-Gnathion	114.5	3.9	111.3	4.9
80	Cond-Menton	111.0	4.0	108.2	4.6
81	Cond-Gonion	54.0	3.5	51.5	2.7
82	Art-Low Inc Edge	95.0	3.6	91.7	5.2
83	Art-Infradentae	97.0	3.3	94.0	4.8
84	Art-B Point	99.1	3.2	96.4	4.8
85	Art-Pogonion	106.9	3.4	103.8	5.2
86	Art-Gnathion	108.1	3.5	105.1	5.2
87	Art-Menton	104.4	3.7	101.6	4.9
88	Art-Gonion	44.2	3.4	41.6	3.2
89	Gonion-Low Inc Edge	77.3	3.3	74.9	4.5
90	Gonion-Infradentale	74.2	2.9	72.2	4.1
91	Gonion-B Point	71.6	2.7	70.5	3.9
92	Gonion-Pogonion	75.1	2.8	74.0	4.2
93	Gonion-Gnathion	74.4	2.8	73.4	4.4
94	Gonion-Menton	69.6	3.0	69.0	4.2
95	Ant Ramus-Post Ramus	35.6	2.3	34.5	2.4
96	Cond ⊥ Mand P1	45.8	4.4	44.0	3.9

## AGE 6

## I. Mandibular Region (cont.)

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
97	Cor Process $\perp$ Mand P1	50.7	3.2	49.6	3.3
98	Low Molar Tip $\perp$ Mand P1	27.7	4.0	26.0	3.9
99	Low Molar CEJ $\perp$ Mand P1	21.1	4.6	19.3	4.7
100	Low Inc (ling) $\perp$ Mand P1	28.7	2.5	28.0	2.5
101	Low Inc Edge $\perp$ Mand P1	36.9	2.6	35.8	2.3
102	Infradentale $\perp$ Mand P1	28.5	2.6	28.1	3.2
103	Infradentale-Menton	28.6	2.6	28.2	3.2
104	Low Inc Edge-Menton	37.1	2.6	36.2	2.2
105	Low Inc Edge-Low Inc Apex	16.1	5.4	14.1	5.1
106	Pogonion-Ling Symp Point	15.2	1.1	14.6	1.8
107	Pogonion $\perp$ N-B Point	-1.0	1.7	-0.7	1.5
108	Low Inc Edge $\perp$ N-B Point	2.5	2.2	1.7	2.3
109	Low Inc Edge $\perp$ PG/N-B Point	3.5	3.4	2.4	3.4
110	Infradentale-Low Molar CEJ	29.8	1.9	29.1	2.5
111	D Occ1 P1 $\perp$ Low Mol M Contact D Occ1 P1 $\perp$ Low Inc Edge	27.8	1.8	26.8	2.6
112	Low Inc Edge-Low Mol M Cont.	28.7	2.1	27.8	2.8
113	Low Inc Edge-Low Mol D Cont.	40.5	2.1	39.4	3.1
114	Low Inc Edge $\perp$ N-Pogonion	3.2	3.0	2.2	3.1
115	Low Inc Edge $\perp$ A Point-PG	0.0	2.2	-0.5	2.7

AGE 15

## II. Maxillary Region

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
116	PNS-ANS	59.6	3.6	57.1	2.7
117	PNS-A Point	53.8	3.4	52.0	2.6
118	PNS-Supradentale	58.9	4.4	56.5	3.0
119	PNS-Up Inc Edge	65.2	4.8	62.6	3.7
120	PTM-ANS	63.0	3.0	61.3	3.6
121	PTM-A Point	58.5	3.1	57.3	3.4
122	PTM-Supradentale	65.4	4.0	63.5	3.3
123	PTM-Up Inc Edge	73.1	4.6	71.2	3.7
124	PM Vert-Up Inc Edge	64.0	5.5	63.9	5.6
125	PM Vert-Supradentale	61.3	4.3	60.6	4.2
126	PM Vert-A Point	57.4	3.4	56.5	3.6
127	PM Vert-ANS	62.8	3.0	61.0	3.6
128	Ethmoid Reg Pt-PNS	54.0	3.8	49.6	2.8
129	Orbitale ⊥ Pal P1	26.7	3.0	25.6	2.0
130	ANS-Nasion	59.0	4.0	55.3	3.2
131	ANS-Up Inc Edge	32.4	2.8	29.4	3.2
132	ANS-Supradentale	19.5	2.8	16.6	2.6
133	Pal P1 ⊥ Supradentale	19.0	2.8	16.2	2.7
134	Pal P1 ⊥ Up Inc Edge	32.2	2.8	29.1	3.3
135	Pal P1 ⊥ Up Mol M CEJ	19.0	3.0	16.5	2.2
136	Pal P1 ⊥ Up Mol M Tip	26.3	3.0	23.9	2.2
137	Up Inc Edge-Up Inc Apex	27.8	1.8	26.6	1.7
138	Supradentale-Up Mol M CEJ	31.0	2.6	29.2	2.2

AGE 8

## II. Maxillary Region (cont.)

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
139	Downs Occ1 P1 $\perp$ Up Mol M Cont Downs Occ1 P1 $\perp$ Up Inc Edge	33.3	2.6	32.2	3.2
140	Up Inc Edge-Up Mol M Contact	33.6	2.6	32.4	3.2
141	Up Inc Edge-Up Mol D Contact	46.0	2.6	44.7	3.3
142	N-Pogonion $\perp$ A Point	4.4	2.5	4.1	2.4
143	N-Pogonion $\perp$ Up Inc Edge	8.6	4.1	7.8	3.8
144	N-A Point $\perp$ Up Inc Edge	2.3	2.4	2.1	2.1
145	A-Pogonion $\perp$ Up Inc Edge	5.9	2.9	5.3	2.7
146	Eth Reg Pt -N	47.9	2.4	45.1	3.1
147	Eth Reg Pt-FMN Suture	39.0	2.8	36.6	3.0
148	Sella-FMN Suture	66.0	3.1	63.6	2.7
149	Sella-Nasion	75.2	3.0	72.3	2.9
150	Sella-Eth Reg Pt	27.4	2.4	27.3	1.8
151	Sella-S O Syn	15.6	1.9	15.3	2.0
152	Sella-Basion	43.0	2.7	41.5	3.7
153	Basion-S O Syn	28.4	2.7	27.2	3.2
154	Basion-Nasion	107.5	3.8	103.9	5.3
155	Basion-Opisthion	37.7	3.6	35.0	2.9

AGE 10

## III. Interregional Measurements

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
156	Supradent-Infradent	21.6	3.3	22.0	2.4
157	Up Inc Ling-Low Inc Ling	15.0	2.9	15.5	2.8
158	Menton-ANS	68.9	4.9	65.3	4.9
159	Menton ⊥ Pal Pl	64.3	4.2	61.5	3.9
160	Menton-Nasion	118.7	5.7	115.1	6.7
161	Menton-FMN Suture	112.2	5.5	109.0	6.4
162	Sella-PNS	50.3	3.0	48.3	2.7
163	Sella-ANS	90.2	3.9	87.3	4.1
164	Sella-A Point	88.5	3.7	85.5	4.4
165	Sella-Supradentale	96.7	4.4	92.7	4.9
166	Sella-Up Inc Edge	106.2	4.5	101.9	4.9
167	Sella-Low Inc Edge	100.2	4.3	96.5	5.0
168	Sella-Supradentale	105.7	4.1	102.3	4.5
169	Sella-B Point	110.9	4.2	107.5	5.0
170	Sella-Pogonion	121.3	4.8	117.2	5.5
171	Sella-Gnathion	124.0	4.8	120.0	5.5
172	Sella-Menton	121.3	4.8	117.6	5.3
173	Sella-Gonion	73.6	4.6	70.2	4.1
174	Sella-Articulare	33.7	3.1	32.6	3.4
175	Sella-Condylion	23.6	2.7	22.3	4.0
176	Nasion-Condylion	93.3	3.9	89.6	4.5
177	Condylion-PNS	44.2	3.0	42.2	2.7
178	Nasion-Articulare	98.9	3.9	95.6	4.5

AGE 16

## III. Interregional Measurements (cont.)

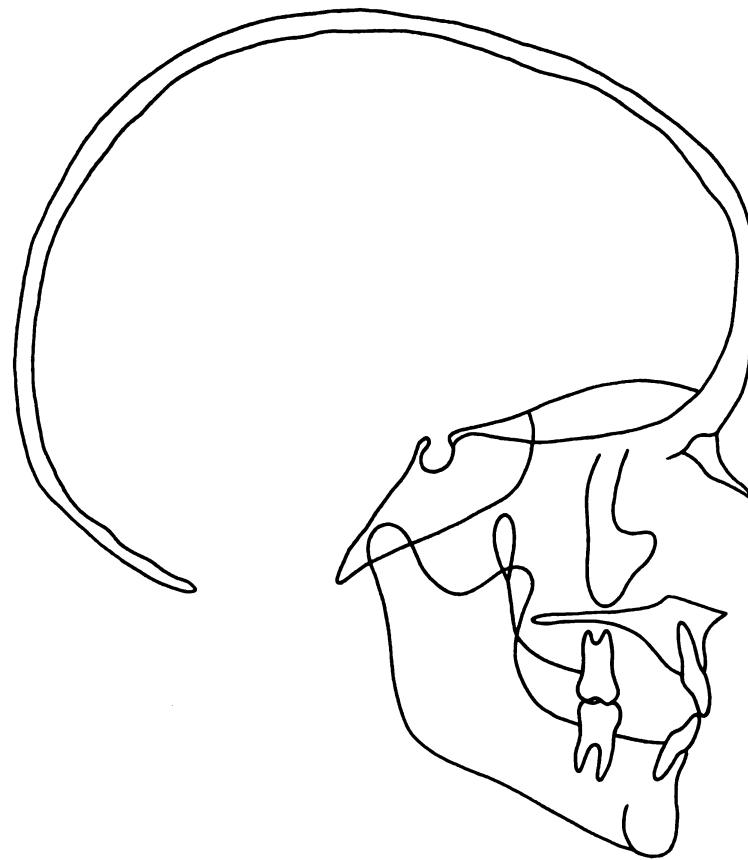
Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
179	Articulare-PNS	44.3	2.4	42.0	3.3
180	Basion-PNS	52.2	3.4	49.7	4.5
181	Basion-ANS	113.4	5.1	106.2	7.8
182	Basion-A Point	107.8	5.2	101.4	7.5
183	Basion-Supradentale	113.5	5.4	106.3	8.1
184	Basion-Infradentale	114.8	5.4	107.9	7.6
185	Basion-B Point	115.5	5.2	109.9	6.6
186	Basion-Pogonion	126.5	5.1	118.4	6.2
187	Basion-Gnathion	128.1	4.8	119.6	6.4
188	Basion-Menton	123.7	5.0	116.9	5.6
STOP 0					
#EXECUTION TERMINATED					
#					

## AGE 16

### ANGULAR MEASUREMENTS

Var.	Description	Males		Females	
		Mean	S.D.	Mean	S.D.
1	S-N-Ant Nasal Spine	87.4	4.6	87.3	4.1
2	S-N-A Point	81.4	4.4	81.8	3.7
3	S-N-B Point	78.2	3.9	79.2	2.3
4	A Point-N-B Point	3.2	2.3	2.6	2.4
5	S-N-Pogonion	79.3	3.5	80.2	2.5
6	S-N/N-Gnathion	78.3	3.6	79.1	2.5
7	S-N/Frankfort Pl	3.1	3.6	4.8	2.9
8	S-N/Condylar Pl	6.5	2.6	8.5	2.3
9	S-N/Palatal Pl	7.0	3.0	8.0	2.2
10	S-N/Funct Occl Pl	14.1	3.9	15.4	3.1
11	S-N/Downs Occl Pl	12.9	4.1	14.4	2.5
12	S-N/Gonion-Gnathion	32.6	5.2	31.3	3.1
13	S-N/Mandibular Pl	32.9	5.2	31.2	3.0
14	S-N/Go Int-Art Post	89.4	4.5	89.0	4.3
15	S-N/S-Gnathion	67.3	3.9	65.8	3.5
16	S-N/PM Vert	103.9	5.1	108.0	5.5
17	S-N-Basion	128.9	5.9	131.1	4.1





## CEPHALOMETRIC ANALYSES

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## DOWNS ANALYSIS

The Downs analysis was based on a study of twenty boys and girls  $14.5 \pm 2.5$  years. The sample was selected on the basis of "excellent occlusion, physiological balance, and harmony of facial musculature".

### I. SKELETAL PATTERN

#### 1. Facial Angle

(PG-N / PO-OR)

Variable 21

Downs Norm

Mean      S.D.  
87.8      3.6

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	82.5	3.1	6	12	83.2	3.2
7	22	81.7	3.4	7	14	83.4	3.1
8	23	82.1	3.3	8	18	83.8	2.8
9	23	81.9	3.6	9	15	84.3	3.0
10	24	82.1	3.4	10	14	84.0	3.5
11	25	82.6	3.5	11	13	84.6	2.7
12	24	82.6	3.8	12	13	85.0	3.0
13	23	82.3	3.4	13	9	86.1	1.9
14	20	83.3	3.7	14	9	86.7	3.7
15	17	82.9	4.5	15	7	87.2	3.0
16	13	82.5	3.9	16	5	86.0	2.5

## Downs Analysis (cont.)

2. Angle of Convexity

(N-A-PG)

Variable 52

Downs Norm

Mean      S.D.  
0            5.1

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	11.7	4.9	6	25	10.1	4.8
7	44	10.6	4.9	7	31	12.0	5.4
8	44	9.3	5.1	8	36	9.0	5.2
9	46	8.0	4.5	9	31	7.6	5.6
10	45	7.9	4.9	10	35	7.2	5.7
11	43	7.5	4.5	11	30	6.6	4.5
12	44	6.7	4.8	12	27	6.4	5.5
13	43	6.1	4.8	13	29	5.4	5.3
14	40	5.2	4.8	14	25	5.3	5.9
15	33	4.9	5.1	15	19	4.1	5.9
16	23	4.4	6.0	16	9	3.2	5.6

3. AB Plane Angle

(A-B / N-PG)

Variable 51

Downs Norm

Mean      S.D.  
-4.6        3.7

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	-6.5	2.9	6	25	-5.9	2.9
7	44	-6.5	3.3	7	31	-6.9	3.5
8	44	-6.3	2.9	8	36	-6.1	3.1
9	46	-5.9	2.5	9	31	-5.6	3.7
10	45	-6.3	2.7	10	35	-5.9	3.7
11	43	-6.6	2.6	11	30	-5.9	3.2
12	44	-6.1	2.7	12	27	-5.9	3.6
13	43	-6.0	2.7	13	29	-5.7	3.4
14	40	-5.9	2.9	14	25	-5.7	3.5
15	33	-5.8	2.9	15	19	-5.1	3.9
16	23	-6.0	3.1	16	9	-4.9	3.5

**Downs Analysis (cont.)**

**4. Mandibular Plane Angle**

(OR-PO / ME-GOI)

Variable 26

Downs Norm

Mean S.D.

21.9 3.2

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	21	29.3	3.9	6	12	29.4	4.5
7	22	30.1	5.9	7	14	29.7	3.7
8	23	29.4	4.8	8	18	28.6	3.8
9	23	29.5	5.5	9	15	28.4	4.9
10	24	29.6	5.0	10	14	28.9	4.2
11	25	29.1	4.7	11	13	28.8	4.4
12	24	29.4	5.5	12	13	28.1	5.2
13	23	29.0	5.1	13	9	26.0	4.3
14	20	27.7	5.8	14	9	24.8	5.8
15	17	28.5	6.2	15	7	24.6	4.1
16	13	28.7	5.2	16	5	25.8	3.0

**5. Y Axis**

(OR-PO / GN-S)

Variable 28

Downs Norm

Mean S.D.

59.4 3.8

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	21	59.9	3.6	6	12	59.8	3.9
7	22	61.1	4.5	7	14	60.8	3.8
8	23	60.9	3.9	8	18	59.8	3.1
9	23	61.4	4.3	9	15	60.4	3.5
10	24	61.8	3.9	10	14	60.8	4.2
11	25	61.6	3.9	11	13	60.6	3.7
12	24	62.2	4.5	12	13	60.5	3.8
13	23	62.6	3.9	13	9	59.5	2.1
14	20	61.8	4.5	14	9	58.9	3.8
15	17	63.1	5.0	15	7	58.0	3.4
16	13	63.5	3.8	16	5	59.6	2.6

### Downs Analysis (cont.)

#### II. DENTURE PATTERN

##### 1. Cant of Occlusal Plane

(OR-PO / ADP-PDP)

Variable 25

Downs Norm

Mean      S.D.

9.3      3.8

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	21	11.4	3.6	6	12	11.8	5.0
7	22	12.3	3.9	7	14	12.0	4.0
8	23	12.0	3.4	8	18	10.9	3.6
9	24	12.2	4.4	9	15	10.7	3.6
10	25	12.0	3.7	10	14	10.8	3.7
11	25	11.3	3.6	11	13	10.4	2.9
12	24	11.4	4.8	12	13	9.4	3.0
13	23	11.6	4.3	13	9	8.1	2.4
14	20	9.7	4.1	14	9	7.7	3.5
15	17	9.9	5.0	15	7	7.5	1.8
16	13	9.7	3.5	16	5	8.3	1.5

##### 2. Interincisal Angle

(LIE-LIA / UIE-UIA)

Variable 61

Downs Norm

Mean      S.D.

135.4      5.8

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	37	139.4	13.4	6	25	142.2	14.2
7	43	134.6	13.2	7	31	135.0	13.6
8	44	128.1	11.2	8	36	127.2	10.2
9	46	126.3	9.2	9	31	125.5	9.7
10	45	124.6	8.6	10	35	125.4	8.9
11	43	124.9	9.1	11	30	126.9	9.1
12	44	127.1	9.7	12	27	125.5	10.0
13	43	127.6	10.9	13	29	128.6	8.4
14	40	129.6	10.8	14	25	128.0	9.5
15	33	129.2	10.1	15	19	131.9	10.3
16	23	126.6	10.0	16	9	133.6	13.0

**Downs Analysis (cont.)**

**3. Lower Incisor to Occlusal Plane**

(LIA-LIE / PDP-ADP)

Variable 68

Downs Norm

Mean S.D.

14.5 3.5

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	15.7	8.4	6	25	13.8	8.7
7	43	17.4	7.6	7	31	16.8	7.9
8	44	21.0	6.1	8	36	20.8	6.9
9	46	21.7	5.6	9	31	21.6	6.8
10	45	23.1	5.5	10	35	21.8	6.9
11	43	23.5	5.6	11	30	21.5	6.4
12	44	22.7	6.4	12	27	22.6	6.9
13	43	23.6	6.6	13	29	22.5	7.2
14	40	22.4	6.9	14	25	22.3	7.4
15	33	23.4	6.3	15	19	19.7	7.4
16	23	25.3	6.8	16	9	18.9	10.1

**4. Lower Incisor to Mandibular Plane**

[GOI-ME / LIA-LIA (-90°)]

Variable 70

Downs Norm

Mean S.D.

2.7 1.8

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	-0.1	6.7	6	25	-1.4	7.2
7	43	1.0	6.5	7	31	-0.1	8.0
8	44	4.3	5.7	8	36	3.6	6.8
9	47	5.2	5.7	9	31	4.2	7.0
10	46	6.1	5.0	10	35	4.1	6.7
11	43	6.2	5.3	11	30	3.4	5.8
12	44	5.4	5.8	12	27	4.9	6.6
13	43	6.3	6.9	13	29	3.3	5.7
14	40	4.9	7.2	14	25	4.5	6.9
15	33	4.8	6.8	15	19	2.3	6.5
16	23	5.6	6.6	16	9	2.0	9.4

## Downs Analysis (cont.)

5. <u>Upper Incisor to AP Plane</u> (UIE ⊥ A-PG)				Downs Norm			
				Variable 145		Mean	S.D.
Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	37	4.0	2.4	6	25	3.4	2.9
7	44	4.8	2.5	7	31	4.0	2.3
8	44	5.9	2.9	8	36	5.3	2.7
9	46	6.9	2.5	9	31	6.7	2.8
10	45	7.7	2.6	10	35	6.7	2.4
11	43	8.0	2.5	11	30	6.5	2.7
12	44	7.2	2.6	12	27	6.9	3.0
13	43	7.0	3.0	13	29	6.4	2.6
14	40	6.6	2.8	14	25	6.3	2.4
15	33	6.4	2.9	15	19	5.7	3.0
16	23	7.4	2.7	16	9	5.2	3.2

## References

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- Downs, W.B., The role of cephalometrics in orthodontic case analysis. Amer. J. Orthodont. 38: 162-182, 1952.
- Downs, W.B., Analysis of the dentofacial profile. Angle Orthodont. 26:191-211, 1956.

## STEINER ANALYSIS

The Steiner analysis provides a group of norms which have been used as an aid to diagnosis in clinical practice. Steiner did not derive his "normal values" from a specific sample, but he credits Downs, Reidel, J. R. Thompson, Margolis, Wylie and others with some of the concepts and values incorporated into his analysis.

1. SNA Angle  
(S-N-A)  
Variable 2

Steiner Norm  
 $82^\circ$

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	81.9	3.3	6	25	80.7	3.0
7	44	80.7	3.0	7	31	81.9	3.0
8	44	81.0	3.1	8	36	81.2	3.3
9	47	80.6	3.0	9	31	80.5	3.2
10	46	80.8	3.1	10	35	80.7	3.7
11	43	80.8	3.0	11	30	81.1	3.8
12	44	81.2	3.3	12	27	81.4	3.6
13	43	81.2	3.4	13	29	81.0	3.8
14	40	80.7	3.4	14	25	81.3	3.5
15	33	80.9	3.2	15	19	81.8	3.5
16	23	81.4	4.4	16	9	81.8	3.7

Steiner Analysis (cont.)

2. SNB Angle

(S-N-B)

Variable 3

Steiner Norm

80°

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	76.5	2.6	6	25	76.0	3.5
7	44	75.7	2.8	7	31	76.3	3.1
8	44	76.3	2.8	8	36	76.7	3.3
9	46	76.4	2.5	9	31	76.5	3.4
10	45	76.5	2.5	10	35	76.7	3.5
11	43	76.5	2.6	11	30	77.3	3.9
12	44	77.3	2.7	12	27	77.7	3.4
13	43	77.5	3.0	13	29	77.5	3.9
14	40	77.3	3.1	14	25	77.9	3.8
15	33	77.6	3.0	15	19	78.9	3.9
16	23	78.2	3.9	16	9	79.2	2.3

3. ANP Angle

(A-N-B)

Variable 4

Steiner Norm

2°

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	5.3	2.2	6	25	4.7	2.2
7	44	5.0	2.3	7	31	5.7	2.7
8	44	4.8	2.2	8	36	4.6	2.4
9	46	4.2	1.9	9	31	4.0	2.6
10	45	4.3	2.0	10	35	4.0	2.7
11	43	4.3	1.9	11	30	3.8	2.2
12	44	3.9	2.1	12	27	3.7	2.4
13	43	3.7	2.0	13	29	3.5	2.4
14	40	3.4	2.0	14	25	3.4	2.5
15	33	3.3	2.1	15	19	2.9	2.7
16	23	3.2	2.3	16	9	2.6	2.4

### Steiner Analysis (cont.)

**4. Upper Incisor to NA (mm)**
**Steiner Norm**

4 mm

**(UIE ⊥ N-A)**
**Variable 144**

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	-0.2	1.9	6	25	-0.2	2.5
7	44	1.0	2.2	7	31	-0.2	2.6
8	44	2.3	2.4	8	36	2.1	2.1
9	47	3.7	2.1	9	31	3.8	2.4
10	46	4.5	2.2	10	35	3.8	2.2
11	43	4.8	2.3	11	30	3.9	2.4
12	44	4.3	2.7	12	27	4.3	2.8
13	43	4.4	2.5	13	29	4.2	2.6
14	40	4.3	2.8	14	25	4.1	2.5
15	33	4.2	3.0	15	19	3.9	3.2
16	23	5.5	2.7	16	9	3.8	2.7

**5. Upper Incisor to NA (angle)**
**Steiner Norm**

22°

**(UIE-UIA / N-A)**
**Variable 60**

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	14.0	8.1	6	25	12.6	9.5
7	44	18.0	8.3	7	31	16.9	9.9
8	44	21.9	6.6	8	36	23.1	6.1
9	47	23.8	4.9	9	31	24.8	6.0
10	46	24.2	5.3	10	35	24.8	7.0
11	43	23.8	6.0	11	30	24.0	6.1
12	44	22.8	5.7	12	27	24.2	6.5
13	43	22.1	5.8	13	29	22.9	5.4
14	40	21.9	5.6	14	25	22.7	5.4
15	33	22.1	5.8	15	19	21.9	7.0
16	23	23.8	6.1	16	9	21.4	6.9

## Steiner Analysis (cont.)

6. Lower Incisor to NB (mm)  
 (LIE ⊥ N-B)  
 Variable 108

Steiner Norm  
 4 mm

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	37	2.5	2.2	6	25	1.7	2.3
7	44	2.9	2.3	7	31	2.8	2.1
8	44	4.0	2.5	8	36	3.4	2.3
9	47	4.5	2.4	9	31	4.2	2.3
10	46	5.2	2.3	10	35	4.4	2.1
11	43	5.4	2.5	11	30	4.5	2.3
12	44	5.2	2.6	12	27	5.0	2.5
13	43	5.3	2.8	13	29	4.6	2.4
14	40	4.9	2.8	14	25	4.7	2.6
15	33	5.1	2.7	15	19	3.9	2.8
16	23	6.1	2.9	16	9	3.4	3.6

7. Lower Incisor to NB (angle)  
 (N-B / LIE-LIA)  
 Variable 73

Steiner Norm  
 25°

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	21.2	8.0	6	25	20.4	7.9
7	43	22.1	7.1	7	31	22.4	7.9
8	44	25.3	6.2	8	36	25.1	6.8
9	47	25.8	5.9	9	31	25.7	7.0
10	46	27.1	5.6	10	35	25.8	6.2
11	43	27.0	6.0	11	30	25.3	6.0
12	44	26.1	6.4	12	27	26.5	6.7
13	43	26.6	7.2	13	29	25.0	6.2
14	40	25.1	7.1	14	25	25.9	7.1
15	33	25.3	6.5	15	19	23.3	6.6
16	23	26.4	7.3	16	9	22.4	9.6

### Steiner Analysis (cont.)

**8. Pogonion to NB Plane  
 (PG ⊥ N-B)**  
**Variable 107**

**Steiner Norm  
 Not Established**

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
		mm	mm			mm	mm
6	37	-1.0	1.7	6	25	-0.7	1.5
7	44	-0.5	1.5	7	31	-0.6	1.3
8	44	0.2	1.4	8	36	0.2	1.3
9	47	0.5	1.3	9	31	0.5	1.6
10	46	0.8	1.6	10	35	0.9	1.1
11	43	1.2	1.5	11	30	1.2	1.2
12	44	1.3	1.6	12	27	1.3	1.5
13	43	1.5	1.8	13	29	1.7	1.3
14	40	1.9	1.6	14	25	1.7	1.6
15	33	2.1	1.8	15	19	1.9	1.4
16	23	2.4	2.5	16	9	2.1	1.6

**9. Upper Incisor to Lower  
 Incisor  
 (LIE-LIA/UIE-UIA)**  
**Variable 61**

**Steiner Norm  
 131°**

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
		deg.	deg.			deg.	deg.
6	37	139.4	13.4	6	25	142.2	14.2
7	43	134.6	13.2	7	31	135.0	13.6
8	44	128.1	11.2	8	36	127.2	10.2
9	46	126.3	9.2	9	31	125.5	9.7
10	45	124.6	8.6	10	35	125.4	8.9
11	43	124.9	9.1	11	30	126.9	9.1
12	44	127.1	9.7	12	27	125.5	10.0
13	43	127.6	10.9	13	29	128.6	8.4
14	40	129.6	10.8	14	25	128.0	9.5
15	33	129.2	10.1	15	19	131.9	10.3
16	23	126.6	10.0	16	9	133.6	13.0

### Steiner Analysis (cont.)

#### 10. Occlusal Plane to S-N

(ADP-PDP/S-N)

Variable 11

Steiner Norm

14°

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	19.0	4.6	6	25	20.6	4.8
7	44	19.2	4.4	7	31	19.3	3.9
8	44	18.1	3.4	8	36	17.7	3.5
9	47	17.6	3.3	9	31	17.6	3.1
10	46	17.5	3.2	10	35	17.3	3.5
11	43	17.0	3.8	11	30	16.5	3.6
12	44	16.2	3.7	12	27	16.3	3.3
13	43	15.6	3.8	13	29	15.0	4.0
14	40	15.4	3.9	14	25	15.7	4.0
15	33	14.3	3.8	15	19	14.7	3.8
16	23	12.9	4.1	16	9	14.4	2.5

#### 11. GO-GN to S-N

(GO-GN / S-N)

Variable 12

Steiner Norm

32°

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	34.8	3.8	6	25	35.8	5.5
7	44	35.6	4.8	7	31	36.3	4.6
8	44	34.7	4.4	8	36	34.9	4.8
9	46	34.2	4.4	9	31	35.0	5.1
10	45	34.4	4.5	10	35	35.0	4.8
11	43	34.3	4.5	11	30	34.6	5.3
12	44	33.5	4.8	12	27	34.0	5.1
13	43	32.9	4.8	13	29	34.2	5.4
14	40	32.9	5.0	14	25	33.5	6.0
15	33	32.9	5.0	15	19	32.1	5.5
16	23	32.6	5.2	16	9	31.3	3.1

**References**

- Steiner, C., Cephalometrics for you and me. Amer. J. Orthodont. 39: 729-755, 1953.
- Steiner, C., Cephalometrics in clinical practice. Angle Orthodont. 29:8-29, 1959.
- Steiner, C., The use of cephalometrics as an aid to planning and assessing orthodontic treatment. Amer. J. Orthodont. 46: 721-735, 1960.
- Steiner, C., Cephalometrics as a clinical tool, in Kraus, B.A. and R.A. Reidel (eds.) Vistas in Orthodontics. Lea and Febriger, Philadelphia, 1962.

## RICKETTS ANALYSIS

An initial set of cephalometric norms were described by Ricketts in 1961. These values were derived from a statistical analysis of 1000 cases (600 females, 400 males) with an average age of "about nine years". Sixty percent of this cross-sectional sample has class II malocclusions.

Ricketts has since expanded his analytical procedure and currently has norms for 51 measures from the lateral cephalogram and 49 from the PA cephalograms. These values are utilized in both his short-term treatment projection and his long-term growth predictions.

For the purpose of this atlas, six of the initial measurements presented by Ricketts are considered below.

1. Facial Angle  
(PG-N/PO-OR)  
Variable 21

	Ricketts	Norm
Mean		S.D.
85.4		3.7

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	21	82.5	3.1	6	12	83.2	3.2
7	22	81.7	3.4	7	14	83.4	3.1
8	23	82.1	3.3	8	18	83.8	2.8
9	23	81.9	3.6	9	15	84.3	3.0
10	24	82.1	3.4	10	14	84.0	3.5
11	25	82.6	3.5	11	13	84.6	2.7
12	24	82.6	3.8	12	13	85.0	3.0
13	23	82.3	3.4	13	9	86.1	1.9
14	20	83.3	3.7	14	9	86.7	3.7
15	17	82.9	4.5	15	7	87.2	3.0
16	13	82.5	3.9	16	5	86.0	2.5

### Ricketts Analysis (cont.)

2. X - Y Axis Angle (N-BA/GN-S)				Ricketts		Norm
				Mean	S.D.	
Variable 74				3.0	3.0	

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	37	6.0	2.9	6	25	5.2	3.3
7	44	4.7	3.2	7	31	4.3	2.8
8	44	4.9	3.5	8	36	5.4	3.4
9	46	5.0	3.2	9	31	4.4	3.6
10	45	4.4	3.4	10	35	4.3	3.9
11	43	4.2	3.4	11	30	4.7	3.8
12	44	4.4	3.5	12	27	4.9	3.7
13	43	4.3	3.4	13	29	4.2	4.4
14	40	3.7	3.9	14	25	4.4	4.7
15	33	3.6	3.9	15	19	5.7	4.7
16	23	4.2	3.8	16	9	6.5	4.5

3. Facial Contour (A ⊥ N - PG)				Ricketts		Norm
				Mean	S.D.	
				4.1 mm	2.8 mm	

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	37	5.2	2.3	6	25	4.5	2.2
7	44	4.9	2.4	7	31	5.4	2.5
8	44	4.4	2.5	8	36	4.1	2.4
9	47	3.8	2.3	9	31	3.6	2.7
10	46	3.9	2.5	10	35	3.5	2.8
11	43	3.8	2.4	11	30	3.2	2.2
12	44	3.4	2.6	12	27	3.1	2.7
13	43	3.2	2.6	13	29	2.7	2.6
14	40	2.8	2.6	14	25	2.7	3.0
15	33	2.8	2.8	15	19	2.1	3.0
16	23	2.6	3.4	16	9	1.7	2.9

**Ricketts Analysis (cont.)**

<b>4. Lower Incisor to A-PG Line</b>				<b>Ricketts</b>	<b>Norm</b>
				<b>Mean</b>	<b>S.D.</b>
<b>Variable 115</b>				<b>0.5 mm</b>	<b>2.7 mm</b>

<b>Age</b>	<b>N</b>	<b>Male</b>		<b>Female</b>		<b>S.D.</b>
		<b>Mean</b>	<b>S.D.</b>	<b>Mean</b>	<b>S.D.</b>	
6	37	0.0	2.2	-0.5	2.7	
7	44	0.2	2.5	0.1	2.5	
8	44	1.1	2.5	0.9	2.4	
9	46	1.8	2.4	1.6	2.7	
10	45	2.2	2.4	1.6	1.8	
11	43	2.2	2.3	1.6	2.3	
12	44	2.2	2.6	2.1	2.5	
13	43	2.2	2.6	1.7	2.3	
14	40	1.8	2.5	1.8	2.4	
15	33	1.9	2.6	1.2	2.5	
16	23	2.8	2.9	0.8	2.8	

<b>5. Upper Incisor to UIE ⊥ A-PG</b>				<b>Ricketts</b>	<b>Norm</b>
				<b>Mean</b>	<b>S.D.</b>
<b>Variable 145</b>				<b>5.7 mm</b>	<b>3.0 mm</b>

<b>Age</b>	<b>N</b>	<b>Male</b>		<b>Female</b>		<b>S.D.</b>
		<b>Mean</b>	<b>S.D.</b>	<b>Mean</b>	<b>S.D.</b>	
6	37	4.0	2.4	3.4	2.9	
7	44	4.8	2.5	4.0	2.3	
8	44	5.9	2.9	5.3	2.7	
9	46	6.9	2.5	6.7	2.8	
10	45	7.7	2.6	6.7	2.4	
11	43	8.0	2.5	6.5	2.7	
12	44	7.2	2.6	6.9	3.0	
13	43	7.0	3.0	6.4	2.6	
14	40	6.6	2.8	6.3	2.4	
15	33	6.4	2.9	5.7	3.0	
16	23	7.4	2.7	5.2	3.2	

### Ricketts Analysis (cont.)

6. Lower Incisor to A-PO Line				Ricketts		Norm	
PG-A/LIA-LIE				Mean		S.D.	
Variable 72				20.5°		6.4°	
Age	N	Male	Female	Age	N	Mean	S.D.
		Mean	S.D.			deg.	deg.
6	37	14.9	6.3	6	25	15.0	7.2
7	43	16.6	6.1	7	31	16.1	7.8
8	44	20.8	5.2	8	36	20.7	6.3
9	46	22.1	4.8	9	31	22.1	6.2
10	45	23.6	4.3	10	35	22.6	5.2
11	43	23.8	4.5	11	30	22.5	5.1
12	44	23.4	5.1	12	27	23.9	5.1
13	43	24.2	5.3	13	29	23.1	4.5
14	40	23.3	5.6	14	25	24.0	5.0
15	33	23.8	5.4	15	19	22.1	4.9
16	23	25.2	4.9	16	9	21.8	7.3

### References

Ricketts, R.M. Cephalometric analysis and synthesis. Angle Orthodontist 31:141-156, 1961

## TWEED ANALYSIS

The Tweed analysis consists of three cephalometric measures whose treatment goal value can be varied to allow the establishment of an achievable and stable treatment objective. Tween did not base his values upon a specific sample.

1. FMA (Frankfort - Mandibular Plane Angle)  
(OR-PO/ME-GOI)  
Variable 26

Tweed Norm			
	Mean	S.D.	
	25	4	

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	21	29.3	3.9	6	12	29.4	4.5
7	22	30.1	5.9	7	14	29.7	3.7
8	23	29.4	4.8	8	18	28.6	3.8
9	23	29.5	5.5	9	15	28.4	4.9
10	24	29.6	5.0	10	14	28.9	4.2
11	25	29.1	4.7	11	13	28.8	4.4
12	24	29.4	5.5	12	13	28.1	5.2
13	23	29.0	5.1	13	9	26.0	4.3
14	20	27.7	5.8	14	9	24.8	5.8
15	17	28.5	6.2	15	7	24.6	4.1
16	13	28.7	5.2	16	5	25.8	3.0

## Tweed Analysis (cont.)

2. FMIA (Frankfort Plane -  
Mandibular Incisor Angle)  
(LIA-LIE/P0-OR)  
Variable 63

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	21	61.3	8.1	6	12	64.8	7.5
7	22	57.9	9.6	7	14	60.3	9.2
8	23	56.4	7.7	8	18	58.0	9.1
9	23	55.4	7.0	9	15	57.8	7.7
10	24	54.5	6.7	10	14	57.0	7.5
11	25	55.2	6.8	11	13	58.0	5.7
12	24	55.7	6.3	12	13	56.7	7.7
13	23	55.2	7.0	13	9	59.1	6.3
14	20	56.6	8.2	14	9	58.3	9.4
15	17	55.9	8.1	15	7	61.5	9.2
16	13	55.6	8.2	16	5	59.0	10.7

3. IMPA (Incisor - Mandibular  
Plane Angle)  
(GOI-ME/LIA-LIA)  
Variable 71

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	37	89.3	6.8	6	25	87.9	7.2
7	43	90.5	6.5	7	31	89.4	8.1
8	44	94.0	5.7	8	36	93.1	7.0
9	47	94.7	5.7	9	31	93.9	7.2
10	46	95.8	5.1	10	35	93.8	6.8
11	43	95.8	5.4	11	30	93.3	6.0
12	44	95.1	5.9	12	27	94.7	6.5
13	42	96.1	7.1	13	29	93.2	6.0
14	39	94.8	7.2	14	25	94.3	6.8
15	32	94.8	7.1	15	19	92.0	6.4
16	23	95.3	6.6	16	9	92.1	9.0

**References**

- Tweed, C.H. The Frankfort-mandibular incisor angle (FMA) in orthodontic diagnosis, treatment planning and prognosis. *Angle Orthodontist.* 24:121-169, 1954.
- Tweed, C.H. Was the development of the diagnostic facial triangle as an accurate analysis based on fact or fancy? *Amer. J. Orthodont.* 48:823-840, 1962.

## ENLOW ANALYSIS

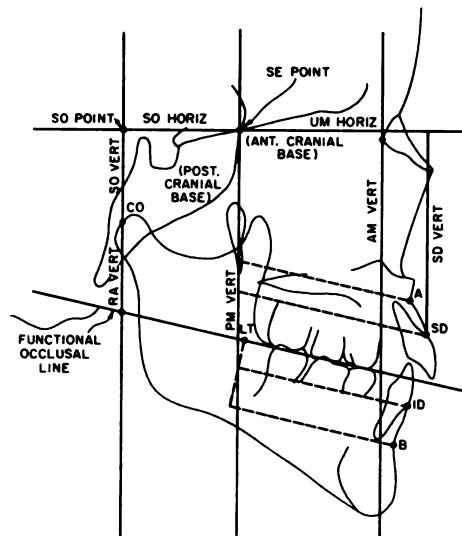


Figure 7 - Landmarks and Planes used in the Enlow analysis.

The Enlow analysis of Growth Equivalence is based on the concept that the parts of the face are so interrelated that changes in one region will produce "equivalent" changes in corresponding areas elsewhere. The form of the craniofacial complex is analyzed by comparing "equivalent" (not necessarily anatomic) bony measurements. The landmarks and planes in this analysis were chosen specifically for their biological significance.

Most of the traditional cephalometric landmarks and planes are not appropriate or usable in this analysis, since the procedure is based on an evaluation of effective dimensions between specific anatomic equivalences of structure. Therefore a simple series of planes has been defined that serves to delineate these particular dimensions (Fig. 4). In most instances the entire dimensions of the bones are not involved, since the planes themselves are constructed in such a way that only the effective dimensions of each bone are utilized (fig. 5).

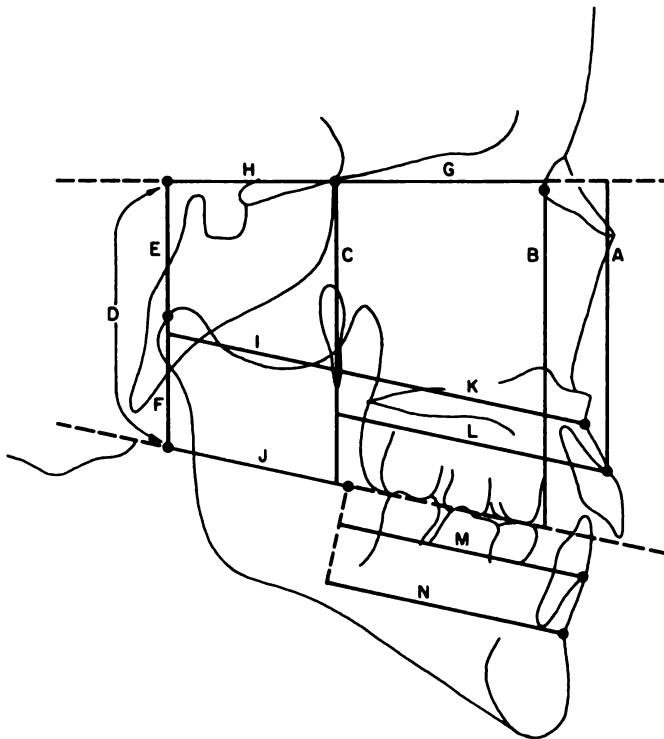


Figure 8. Measurements utilized in the Enlow analysis.

- |   |  |
|---|--|
| (A) SD (Supradentale) Vertical from the intersection with the UM (Upper Maxillary) Horizontal to the intersection with the Functional Occlusal Plane. | the intersection with the SO-RA Vertical parallel to the Functional Occlusal Plane.  |
| (B) AM (Anterior Maxillary) Vertical from the intersection with the UM Horizontal to the intersection with the Functional Occlusal Plane.             | (J) The width of the ramus along the Functional Occlusal Plane.  |
| (C) PM (Posterior Maxillary) Vertical from SE Point to the intersection of the Functional Occlusal Plane.   | (K) The Maxillary Skeletal Distance from A Point to the intersection with the PM Vertical parallel to the Functional Occlusal Plane.       |
| (D) SO-RA (Spheno-Occipital-Ramus) Vertical from SO Point to the intersection with the Functional Occlusal Plane.                                     | (L) Maxillary Skeletal Distance from Supradentale to the intersection with the PM Vertical parallel to the Functional Occlusal Plane.      |
| (E) SO Vertical from SO Point to Condylion.   | (M) Mandibular Dental Distance from Supradentale to a line perpendicular to the LT Point parallel to the Functional Occlusal Plane.        |
| (F) RA Vertical from Condylion to the intersection with the Functional Occlusal Plane.  | (N) Mandibular Skeletal Distance from B Point to a line perpendicular to LT Point parallel to the Functional Occlusal Plane.               |
| (G) UM Horizontal or Anterior Cranial Base from SE Point to the intersection with the AM Vertical.  | (O) The angle of intersection of the Functional Occlusal Plane with the PM Vertical. A perpendicular relationship is considered 0 degrees. |
| (H) SO Horizontal or the Posterior Cranial Base from SO Point to SE Point.  |  |
| (I) Functional Posterior Cranial Base from the intersection of PM Vertical to   |  |

I. MEASUREMENTS  
 (See Figure 8)

## (A) SD (Supradentale) Vertical

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	36	51.9	5.0	6	24	50.7	4.9
7	43	53.3	3.9	7	31	50.0	5.8
8	44	53.3	4.9	8	36	49.2	5.8
9	46	54.2	4.5	9	30	51.1	5.2
10	44	56.8	5.2	10	35	52.4	6.3
11	43	58.6	5.0	11	30	53.8	6.3
12	44	59.6	5.9	12	27	55.0	6.1
13	43	61.4	5.8	13	29	57.3	5.5
14	40	63.9	6.5	14	25	57.8	6.2
15	33	65.3	8.0	15	19	56.5	7.3
16	23	67.5	7.8	16	9	57.3	7.9

## (B) AM (Anterior Maxillary) Vertical

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	36	59.0	4.9	6	24	57.7	4.6
7	43	61.6	4.5	7	31	59.5	4.7
8	44	64.0	4.7	8	36	60.6	5.1
9	46	65.1	4.0	9	30	62.4	5.1
10	44	67.1	5.1	10	35	63.8	5.4
11	43	68.9	5.1	11	30	64.9	5.5
12	44	70.4	5.9	12	27	65.9	5.0
13	42	72.0	6.1	13	29	68.4	4.3
14	39	74.5	6.2	14	25	69.2	4.8
15	32	76.8	7.0	15	19	68.8	5.4
16	23	78.6	7.5	16	9	69.2	5.4

### Enlow Analysis (cont.)

#### (C) PM (Posterior Maxillary) Vertical

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	55.9	3.9	6	24
7	43	57.9	3.6	7	31
8	44	60.0	4.0	8	36
9	46	61.6	3.6	9	30
10	44	63.7	3.6	10	35
11	43	65.4	4.4	11	30
12	44	67.7	4.3	12	27
13	42	70.2	4.1	13	29
14	39	72.8	4.8	14	25
15	32	76.1	4.9	15	19
16	23	78.2	5.8	16	9

#### (D) SO-RA (Spheno-Occipital-Ramus) Vertical

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	53.2	5.6	6	24
7	43	54.7	5.2	7	31
8	44	56.4	6.3	8	36
9	46	58.3	5.1	9	30
10	44	60.8	4.6	10	35
11	43	62.4	5.6	11	30
12	44	65.4	5.7	12	27
13	42	68.6	5.2	13	29
14	39	71.5	6.0	14	25
15	32	75.6	5.6	15	19
16	23	78.0	6.3	16	9

## Enlow Analysis (cont.)

## (E) SO (Spheno-Occipital) Vertical

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	26.8	3.6	26.9	3.5
7	43	28.3	3.6	27.7	4.6
8	44	28.3	4.3	28.5	4.2
9	46	29.3	4.0	28.2	4.7
10	44	29.1	3.8	29.4	4.6
11	43	29.4	3.9	29.9	4.8
12	44	30.0	4.5	29.7	4.1
13	43	30.8	4.5	31.4	5.1
14	40	31.0	3.8	31.6	4.4
15	33	32.8	4.2	30.6	3.9
16	23	32.4	4.4	30.2	3.4

## (F) RA (Ramus) Vertical

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	26.4	5.4	25.7	5.3
7	43	26.4	4.2	26.7	4.4
8	44	28.1	4.4	27.1	4.1
9	46	29.1	3.7	29.6	4.1
10	44	31.7	3.9	31.1	4.2
11	43	33.0	4.6	33.7	3.5
12	44	35.5	4.5	35.0	3.6
13	42	37.8	4.4	38.5	4.7
14	39	40.4	4.7	38.5	4.1
15	32	42.7	4.9	40.4	5.0
16	23	45.6	4.7	42.1	3.4

## Enlow Analysis (cont.)

## (G) UM (Upper Maxillary) Horizontal

-- Anterior Cranial Base --

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	37.2	2.9	6	24
7	43	37.8	3.0	7	31
8	44	38.6	2.9	8	36
9	46	39.0	2.7	9	30
10	44	39.7	3.1	10	35
11	43	40.6	2.9	11	30
12	44	41.0	3.3	12	27
13	43	41.8	3.1	13	29
14	40	42.4	3.1	14	25
15	33	42.6	3.9	15	19
16	23	44.3	4.0	16	9

## (H) SO (Spheno-Occipital) Horizontal

-- Posterior Cranial Base --

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	32.9	2.6	6	24
7	43	34.0	2.3	7	31
8	44	34.8	2.4	8	36
9	46	35.3	2.5	9	30
10	44	36.0	2.7	10	35
11	43	36.5	2.5	11	30
12	44	36.6	2.5	12	27
13	43	37.7	2.8	13	29
14	40	38.5	3.0	14	25
15	33	38.3	2.2	15	19
16	23	38.7	2.5	16	9

## Enlow Analysis (cont.)

## (I) Functional Posterior Cranial Base

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	36	33.7	2.7	6	24	31.9	2.4
7	43	34.6	2.3	7	31	32.8	2.4
8	44	35.5	2.6	8	36	33.8	2.5
9	46	35.8	2.5	9	30	33.9	2.5
10	44	36.5	2.8	10	35	34.2	2.6
11	43	36.9	2.6	11	30	34.6	2.6
12	44	37.0	2.8	12	27	35.0	2.5
13	42	38.1	3.0	13	29	35.7	2.4
14	39	38.9	3.1	14	25	35.8	3.2
15	32	38.7	2.3	15	19	35.8	3.1
16	23	39.0	2.8	16	9	36.3	2.5

## (J) Width of Ramus (along Functional Occlusal Plane)

Age	N	Male		Age	N	Female	
		Mean mm	S.D. mm			Mean mm	S.D. mm
6	36	33.9	1.9	6	24	32.8	2.4
7	43	34.1	2.1	7	31	33.1	3.0
8	44	34.3	2.5	8	36	33.4	2.5
9	46	34.8	2.5	9	30	34.0	2.6
10	44	35.7	2.2	10	35	34.5	2.4
11	43	37.0	2.7	11	30	35.0	2.7
12	44	36.2	2.4	12	27	35.0	2.0
13	43	36.5	2.5	13	29	35.2	2.4
14	40	37.1	3.2	14	25	35.5	2.1
15	33	38.7	3.4	15	19	35.2	2.2
16	23	39.7	2.9	16	9	35.6	2.9

### Enlow Analysis (cont.)

#### (K) Maxillary Skeletal

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	49.0	2.6	6	24
7	43	49.1	3.5	7	31
8	44	49.8	4.1	8	36
9	46	50.8	3.6	9	30
10	44	51.4	2.6	10	35
11	43	52.6	2.7	11	30
12	44	53.8	4.5	12	27
13	42	55.4	3.2	13	29
14	39	55.7	4.5	14	25
15	32	57.4	4.7	15	19
16	23	59.0	3.1	16	9

#### (L) Maxillary Dental

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	51.8	2.2	6	24
7	43	52.3	3.1	7	31
8	44	53.1	3.9	8	36
9	46	54.9	3.5	9	30
10	44	56.0	2.7	10	35
11	43	57.5	2.8	11	30
12	44	58.3	4.0	12	27
13	42	60.1	3.2	13	29
14	39	60.1	3.8	14	25
15	32	61.6	4.7	15	19
16	23	63.9	3.2	16	9

## Enlow Analysis (cont.)

## (M) Mandibular Dental

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	48.7	2.7	6	24
7	43	49.7	3.2	7	31
8	44	52.0	3.3	8	36
9	46	53.8	3.3	9	30
10	44	53.8	3.1	10	35
11	43	54.6	3.5	11	30
12	44	56.5	3.9	12	27
13	42	58.6	4.4	13	29
14	39	58.6	4.6	14	25
15	32	58.0	4.8	15	19
16	23	59.8	4.9	16	9

## (N) Mandibular Skeletal

Age	N	Male		Female	
		Mean mm	S.D. mm	Mean mm	S.D. mm
6	36	47.7	2.8	6	24
7	43	48.9	3.5	7	31
8	44	50.7	3.6	8	36
9	46	52.5	3.6	9	30
10	44	51.7	3.5	10	35
11	43	52.4	3.5	11	30
12	44	54.3	4.2	12	27
13	42	56.1	4.7	13	29
14	39	56.2	4.8	14	25
15	32	55.3	5.1	15	19
16	23	56.2	5.2	16	9

### Enlow Analysis (cont.)

- (0) PM Vertical — Functional Occlusal Plane Angle  
 (A perpendicular relationship between these two planes is 0°.)

Age	N	Male		Age	N	Female	
		Mean deg.	S.D. deg.			Mean deg.	S.D. deg.
6	36	4.6	5.7	6	24	4.3	5.5
7	43	5.4	5.0	7	31	4.2	6.1
8	44	5.8	5.9	8	36	3.9	5.1
9	46	5.2	4.4	9	30	3.7	4.7
10	44	4.6	4.7	10	35	2.4	5.8
11	43	4.8	4.4	11	30	0.9	5.6
12	44	3.5	5.4	12	27	0.8	5.1
13	42	2.3	5.2	13	29	-1.3	6.0
14	39	2.0	5.3	14	25	-0.9	5.8
15	32	0.6	5.5	15	19	-1.9	6.6
16	23	0.3	4.9	16	9	-2.6	6.0

### II. RATIOS OF MEASUREMENTS (Means of individual ratios)

#### 1. Maxillary Skeletal (K) Mandibular Skeletal (N)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.03	0.08	6	24	1.02	0.09
7	43	1.01	0.11	7	31	1.03	0.13
8	44	0.99	0.10	8	36	0.98	0.09
9	46	0.97	0.08	9	30	0.99	0.09
10	44	1.00	0.08	10	35	1.01	0.09
11	43	1.01	0.07	11	30	1.02	0.09
12	44	0.99	0.09	12	27	1.01	0.07
13	42	0.99	0.09	13	29	1.03	0.11
14	39	1.00	0.09	14	25	1.02	0.09
15	32	1.04	0.10	15	19	1.01	0.10
16	23	1.06	0.09	16	9	0.99	0.05

### Enlow Analysis (cont.)

#### 2. Maxillary Dental (L) Mandibular Dental (M)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.07	0.06	6	24	1.08	0.09
7	43	1.06	0.09	7	31	1.06	0.12
8	44	1.02	0.08	8	36	1.03	0.08
9	46	1.02	0.07	9	30	1.04	0.09
10	44	1.04	0.07	10	35	1.05	0.07
11	43	1.06	0.06	11	30	1.06	0.08
12	44	1.03	0.07	12	27	1.05	0.06
13	42	1.03	0.07	13	29	1.06	0.08
14	39	1.03	0.08	14	25	1.05	0.07
15	32	1.07	0.08	15	19	1.04	0.07
16	23	1.07	0.07	16	9	1.04	0.05

#### 3. UM Horizontal (Anterior Cranial Base) (G) SO Horizontal (Posterior Cranial Base) (H)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.14	0.13	6	24	1.12	0.16
7	43	1.12	0.11	7	31	1.11	0.12
8	44	1.11	0.11	8	36	1.08	0.10
9	46	1.11	0.12	9	30	1.09	0.12
10	44	1.11	0.13	10	35	1.11	0.12
11	43	1.12	0.12	11	30	1.10	0.13
12	44	1.12	0.11	12	27	1.09	0.10
13	43	1.12	0.12	13	29	1.10	0.11
14	40	1.11	0.13	14	25	1.11	0.14
15	33	1.11	0.10	15	19	1.14	0.13
16	23	1.15	0.12	16	9	1.09	0.07

## Enlow Analysis (cont.)

4. SD Vertical (A)  
AM Vertical (B)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	0.88	0.04	6	24	0.88	0.04
7	43	0.87	0.05	7	31	0.84	0.07
8	44	0.83	0.04	8	36	0.81	0.05
9	46	0.83	0.03	9	30	0.82	0.03
10	44	0.85	0.03	10	35	0.82	0.04
11	43	0.85	0.03	11	30	0.83	0.04
12	44	0.85	0.03	12	27	0.83	0.04
13	42	0.85	0.03	13	29	0.84	0.04
14	39	0.86	0.03	14	25	0.83	0.04
15	32	0.85	0.04	15	19	0.82	0.05
16	23	0.86	0.03	16	9	0.82	0.06

5. SD Vertical (A)  
PM Vertical (C)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	0.93	0.07	6	24	0.92	0.07
7	43	0.92	0.07	7	31	0.88	0.09
8	44	0.89	0.08	8	36	0.85	0.08
9	46	0.88	0.06	9	30	0.85	0.06
10	44	0.89	0.06	10	35	0.85	0.08
11	43	0.90	0.05	11	30	0.84	0.08
12	44	0.88	0.07	12	27	0.84	0.08
13	42	0.88	0.06	13	29	0.83	0.08
14	39	0.88	0.06	14	25	0.83	0.08
15	32	0.86	0.08	15	19	0.81	0.10
16	23	0.86	0.06	16	9	0.81	0.10

## Enlow Analysis (cont.)

6. SD Vertical (A)  
SO-RA Vertical (D)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	0.98	0.14	6	24	0.97	0.13
7	43	0.98	0.12	7	31	0.93	0.15
8	44	0.96	0.14	8	36	0.89	0.14
9	46	0.93	0.11	9	30	0.89	0.10
10	44	0.94	0.11	10	35	0.87	0.13
11	43	0.94	0.10	11	30	0.85	0.13
12	44	0.92	0.12	12	27	0.86	0.12
13	42	0.90	0.11	13	29	0.83	0.13
14	39	0.90	0.11	14	25	0.83	0.12
15	32	0.87	0.12	15	19	0.80	0.14
16	23	0.87	0.10	16	9	0.80	0.14

7. SD Vertical (A)  
SO Vertical (E)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.98	0.39	6	24	1.92	0.34
7	43	1.91	0.28	7	31	1.87	0.44
8	44	1.93	0.37	8	36	1.77	0.36
9	46	1.89	0.31	9	30	1.86	0.35
10	44	1.98	0.32	10	35	1.83	0.37
11	43	2.02	0.30	11	30	1.85	0.40
12	44	2.03	0.35	12	27	1.89	0.35
13	43	2.03	0.36	13	29	1.88	0.41
14	40	2.09	0.32	14	25	1.87	0.36
15	33	2.02	0.37	15	19	1.89	0.41
16	23	2.12	0.35	16	9	1.92	0.37

## Enlow Analysis (cont.)

8. AM Vertical (B)  
PM Vertical (C)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.06	0.07	6	24	1.05	0.07
7	43	1.06	0.06	7	31	1.05	0.07
8	44	1.07	0.07	8	36	1.05	0.06
9	46	1.06	0.05	9	30	1.04	0.06
10	44	1.05	0.05	10	35	1.03	0.06
11	43	1.05	0.05	11	30	1.01	0.06
12	44	1.04	0.06	12	27	1.01	0.05
13	42	1.03	0.06	13	29	0.99	0.06
14	39	1.02	0.06	14	25	0.99	0.06
15	32	1.01	0.06	15	19	0.98	0.06
16	23	1.01	0.05	16	9	0.98	0.06

9. AM Vertical (B)  
SO-RA Vertical (D)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.12	0.15	6	24	1.11	0.14
7	43	1.14	0.13	7	31	1.11	0.15
8	44	1.15	0.15	8	36	1.10	0.13
9	46	1.12	0.11	9	30	1.09	0.11
10	44	1.11	0.12	10	35	1.06	0.12
11	43	1.11	0.11	11	30	1.03	0.12
12	44	1.08	0.13	12	27	1.02	0.10
13	42	1.05	0.12	13	29	0.99	0.11
14	39	1.05	0.12	14	25	0.99	0.10
15	32	1.02	0.11	15	19	0.98	0.12
16	23	1.01	0.10	16	9	0.96	0.10

## Enlow Analysis (cont.)

10. AM Vertical (B)  
SO Vertical (E)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	2.25	0.40	6	24	2.19	0.38
7	43	2.21	0.32	7	31	2.21	0.43
8	44	2.32	0.42	8	36	2.18	0.40
9	46	2.27	0.35	9	30	2.28	0.43
10	44	2.35	0.37	10	35	2.22	0.40
11	43	2.38	0.35	11	30	2.22	0.41
12	44	2.40	0.40	12	27	2.26	0.34
13	42	2.38	0.41	13	29	2.24	0.42
14	39	2.43	0.34	14	25	2.23	0.36
15	32	2.37	0.37	15	19	2.29	0.39
16	23	2.47	0.37	16	9	2.32	0.30

11. PM Vertical (C)  
SO-RA Vertical (D)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.06	0.07	6	24	1.05	0.06
7	43	1.06	0.06	7	31	1.05	0.07
8	44	1.07	0.07	8	36	1.05	0.06
9	46	1.06	0.05	9	30	1.04	0.05
10	44	1.05	0.05	10	35	1.03	0.06
11	43	1.05	0.05	11	30	1.01	0.06
12	44	1.04	0.06	12	27	1.01	0.05
13	42	1.03	0.05	13	29	0.99	0.05
14	39	1.02	0.06	14	25	1.00	0.05
15	32	1.01	0.05	15	19	0.99	0.05
16	23	1.00	0.04	16	9	0.98	0.05

## Enlow Analysis (cont.)

12. PM Vertical (C)  
SO Vertical (E)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	2.12	0.31	6	24	2.08	0.29
7	43	2.07	0.23	7	31	2.10	0.33
8	44	2.16	0.29	8	36	2.07	0.30
9	46	2.13	0.25	9	30	2.17	0.32
10	44	2.22	0.27	10	35	2.15	0.29
11	43	2.26	0.27	11	30	2.19	0.31
12	44	2.30	0.30	12	27	2.23	0.26
13	42	2.32	0.32	13	29	2.25	0.33
14	39	2.37	0.25	14	25	2.24	0.28
15	32	2.35	0.29	15	19	2.32	0.32
16	23	2.45	0.28	16	9	2.36	0.21

13. SO-RA Vertical (D)  
SO Vertical (E)

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	2.01	0.29	6	24	1.98	0.26
7	43	1.95	0.20	7	31	2.00	0.29
8	44	2.02	0.22	8	36	1.98	0.24
9	46	2.01	0.20	9	30	2.09	0.26
10	44	2.11	0.21	10	35	2.09	0.24
11	43	2.15	0.23	11	30	2.16	0.25
12	44	2.21	0.26	12	27	2.20	0.23
13	42	2.26	0.29	13	29	2.26	0.28
14	39	2.32	0.22	14	25	2.24	0.25
15	32	2.33	0.25	15	19	2.35	0.30
16	23	2.43	0.23	16	9	2.41	0.17

Enlow Analysis (cont.)

14.  $\frac{\text{Maxillary Skeletal Unit Distance}^1}{\text{Mandibular Skeletal Unit Distance}} \frac{(K+H)}{(N+J)}$

Age	N	Male Mean	S.D.	Age	N	Female Mean	S.D.
6	36	1.01	0.04	6	24	1.00	0.04
7	43	1.01	0.04	7	31	1.01	0.05
8	44	1.00	0.05	8	36	0.99	0.04
9	46	0.99	0.03	9	30	0.99	0.04
10	44	1.01	0.04	10	35	1.00	0.04
11	43	1.00	0.03	11	30	1.00	0.04
12	44	1.00	0.03	12	27	1.00	0.04
13	42	1.01	0.03	13	29	1.02	0.05
14	39	1.01	0.04	14	25	1.01	0.04
15	32	1.02	0.04	15	19	1.01	0.04
16	23	1.02	0.05	16	9	1.00	0.04

15.  $\frac{\text{Maxillary Skeletal Unit Distance}^2}{\text{Mandibular Skeletal Unit Distance}} \frac{(K+I)}{(N+J)}$

Age	N	Male Mean	S.D.	Age	N	Female Mean	S.D.
6	36	1.00	0.04	6	24	0.99	0.04
7	43	1.00	0.04	7	31	1.00	0.05
8	44	0.99	0.05	8	36	0.99	0.04
9	46	0.99	0.03	9	30	0.99	0.04
10	44	1.00	0.04	10	35	0.99	0.04
11	43	1.00	0.03	11	30	1.00	0.04
12	44	1.00	0.04	12	27	1.00	0.03
13	42	1.01	0.03	13	29	1.02	0.05
14	39	1.01	0.04	14	25	1.01	0.04
15	32	1.02	0.04	15	19	1.00	0.04
16	23	1.02	0.04	16	9	0.99	0.03

## Enlow Analysis (cont.)

16.  $\frac{\text{Maxillary Dental Unit Distance}^1}{\text{Mandibular Dental Unit Distance}} \frac{(L + H)}{(M + J)}$

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.04	0.03	6	24	1.03	0.03
7	43	1.04	0.03	7	31	1.03	0.04
8	44	1.03	0.04	8	36	1.02	0.04
9	46	1.02	0.02	9	30	1.02	0.04
10	44	1.03	0.03	10	35	1.03	0.03
11	43	1.03	0.02	11	30	1.03	0.03
12	44	1.03	0.02	12	27	1.03	0.02
13	42	1.03	0.02	13	29	1.04	0.03
14	39	1.03	0.02	14	25	1.03	0.02
15	32	1.04	0.02	15	19	1.03	0.02
16	23	1.04	0.03	16	9	1.03	0.02

17.  $\frac{\text{Maxillary Dental Unit Distance}^2}{\text{Mandibular Dental Unit Distance}} \frac{(L + I)}{(M + J)}$

Age	N	Male		Age	N	Female	
		Mean	S.D.			Mean	S.D.
6	36	1.03	0.03	6	24	1.03	0.03
7	43	1.03	0.03	7	31	1.02	0.04
8	44	1.02	0.03	8	36	1.01	0.04
9	46	1.02	0.02	9	30	1.02	0.03
10	44	1.03	0.03	10	35	1.02	0.03
11	43	1.03	0.02	11	30	1.03	0.03
12	44	1.02	0.02	12	27	1.02	0.02
13	42	1.03	0.02	13	29	1.04	0.03
14	39	1.03	0.03	14	25	1.02	0.02
15	32	1.03	0.02	15	19	1.02	0.02
16	23	1.03	0.03	16	9	1.02	0.02

**Enlow Analysis (cont.)****References**

**Enlow, D.H., R.E. Moyers, W.S. Hunter and J.A. McNamara, Jr.** A Procedure for the analysis of intrinsic facial form and growth. *Amer. J. Orthodont.* 56:6-23, 1969.

**Moyers, R.E.,** *Handbook of Orthodontics*, 3rd Edition, Yearbook Medical Publishers, Chicago, Illinois, 1973.



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- Sella / Frankfort Plane	28
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- Articulare	86
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- Condylion	79
- Gonion	93
- Sella	171

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Linear

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- B Point	91
- Condylion	81
- Gnathion	93
- Infradentale	90
- Lower Incisor Incisal Edge	89
- Menton	94
- Pogonion	92
- Sella	173

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<b>Linear</b>		
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- Basion	184	
- Condylion	76	
- Gonion	90	
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- Basion	188	
- Condylion	80	
- Gonion	94	
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- Infradentale	103	
- Lower Incisor Incisal Edge	104	
- Nasion	160	
1 Palatal Plane	159	
- Sella	172	
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<b>Angular</b>		
- A Point / Condylar Plane	30	
- A Point / Frankfort Plane	19	
A Point - Nasion - B Point	4	
- A Point / Palatal Plane	39	
- A Point - Pogonion	52	
- A Point / Upper Incisor	60	
- Anterior Nasal Spine / Condylar Plane	29	
- Anterior Nasal Spine / Frankfort Plane	18	
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**NASION (cont.)**

**Angular**

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- B Point / Frankfort Plane	20
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**Linear**

- A Point $\perp$ Upper Incisor Incisal Edge	144
- Anterior Nasal Spine	130
- Articulare	178
- B Point $\perp$ Lower Incisor Incisal Edge	108
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- Basion	154
- Condylion	176
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**OPISTHION (OP, 29)**

**Linear**

- Basion	155
$\perp$ Palatal Plane	129

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**Angular**

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$\perp$ Functional Occlusal Plane	42
$\perp$ Lower Incisor	64
$\perp$ Mandibular Plane	44
$\perp$ Nasion - A Point	39
$\perp$ Nasion - B Point	40
$\perp$ Nasion - Anterior Nasal Spine	38
$\perp$ Nasion - Pogonion	41
$\perp$ PM Vertical	45
$\perp$ S-N Plane	9
$\perp$ Upper Incisor	56

**Linear**

$\perp$ Menton	159
$\perp$ Orbitale	129
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**POSTERIOR BORDER OF THE RAMUS (PB, 51)**

**Linear**

- Anterior Border of the Ramus	95
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**Angular**

$\perp$ Condylar Plane	37
$\perp$ Downs Occlusal Plane	47
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$\perp$ Functional Occlusal Plane	46
$\perp$ Mandibular Plane	48
$\perp$ Palatal Plane	45
$\perp$ S-N Plane	16

**Linear**

$\perp$ A Point	126
$\perp$ Anterior Nasal Spine	127
$\perp$ Supradentale	125
$\perp$ Upper Incisor Incisal Edge	124

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**Linear**

- A Point	117
- Anterior Nasal Spine	116
- Articular	179
- Basion	180
- Condylion	177
- Ethmoid Registration Point	128
- Sella	162
- Supradentale	118
- Upper Incisor Incisal Edge	119

**POGONION (PG, 3)**

**Angular**

- A Point / Lower Incisor	72
- Nasion / A Point - B Point	51
Nasion - A Point - Pogonion	52
- Nasion / Frankfort Plane	21
- Nasion / Mandibular Plane	49
- Nasion / Palatal Plane	41
Sella - Nasion - Pogonion	5

**Linear**

- A Point $\perp$ Lower Incisor Incisal Edge	115
- A Point $\perp$ Upper Incisor Incisal Edge	145
- Articulare	85
- Basion	186
- Condylion	78
- Gonion	92
- Lingual Symphyseal Point	106
- Nasion $\perp$ A Point	142
$\perp$ Nasion - B Point	107
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**PTERYGO-MAXILLARY FISSURE, INFERIOR (PTM, 43)**

**Linear**

- A Point	121
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**Angular**

- Gnathion / Basion - Nasion	74
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- Posterior Nasal Spine	119		
- Pterygo-Maxillary Fissure	123		
- Sella	166		
- Upper Incisal Apex	137		
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