

# RESEARCH ON GROWTH IN GIRLS ACCORDING TO AGE OF PUBERTY

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I established the sexual year (provisional name) based on the onset of menophania and made a comparative study of the physique to the sexual year.

## MATERIALS AND STATISTICAL METHOD

As method, I distributed questionnaires to each person, regarding day of birth, age of menophania, time of measurement and values of the height, weight, and girth of chest.

## PERIOD OF EXAMINATION

Aichi Koromo Girls' High School—From Apr. 1943 to Apr. 1947.

Nagoya Savings Branch Office—From Oct. 1946 to Oct. 1948.

Kinjo Women's College and  
Girls' High School attached it—From Apr. 1945 to Apr. 1949.

After grouping according to age and sexual years from the questionnaire papers, I calculated the average values of the height, weight, and girth of the chest, the coefficients of stoutness and thinness, the coefficient of the girth of the chest. Next, by applying "the statistical method of correlative diagram and the statistical method in curvilinear co-ordinate fashion originated by Dr. Hirata," I prepared the pseudoelliptic curves of probability of height and weight and that of height and girth of chest, and made comparative studies.

## CONCLUSION

From the 456 students of the Aichi Prefectural Koromo Girls' High School, 1 626 students of Kinjo Women's College and the Girls' High School attached to it, and 747 workers of the Branch Office of the Nagoya Savings Bank. I compared the condition of growth between age and sexual years, and the yearly growth, specially during the postwar years.

1) The average year for menophania was the 3rd month of the 15th year in students of the Aichi prefectural Koromo Girls' High School, the 10th month of the 14th year in students of Kinjo Women's College and the Girls' High School, the 10th month of the 15th year in workers of the Branch Office of Nagoya Savings.

2) The most marked development was from the 13th to the 14th year in

students of Kinjo Women's College and the Girls' High School, from the 13th to the 15th years in students of Koromo Girls' High School, from the 15th to the 16th years in workers of the Nagoya Savings Bank, and these times agreed with the period before onset of menophania.

3) Growth temporarily stopped at the 18th year and the average height at this time was 150 to 152 centimeters, the average weight, 47.0 to 48.0 kg, the average girth of the chest, 78.0 to 79.0 centimeters, and the averages of the coefficients of stoutness and thinness, 23.7 to 24.0, the averages of coefficients of girth of chest, 50.5 to 52.7.

The pseudo-elliptic curve of correlative probability at this year was round, and especially the pseudo-elliptic curve of correlative probability of height, weight approaches a circle.

4) The growths in height, weight, girth of the chest, and coefficients of stoutness and thinness, and coefficients of the girth of chest of those brought up under the same life and environment conditions, no matter what the age may be, develop equally in the sexual years. Particularly regarding height, at the same sexual year, whatever the living conditions and surroundings may be, the growths are generally the same, and they are so before and after onset of menophania.

5) Regardless of the living and environment conditions the age the girl's average height at menophania was 148 centimeter.

6) Regardless too, of the age and the conditions of living and environment, the average weights, girths of the chest, coefficients of stoutness and thinness, coefficients of girth of the chest at menophania showed almost the values: the average weight, 41.0 to 42.0 kilograms, the average girth of the chest, 73.0 to 76.0 centimeters, the average coefficients of stoutness and thinness, 23.1 to 23.5, the average coefficients of girth of the chest, 49.3 to 51.4. But slight differences in value were noticed according to differences in the living and environment of the group.

7) The growth of the sexual years appear a full 1 year before the first menstruation to menophania age, namely immediatly before menophania.

8) In the sexual years, girls grow the equivalent of the full 2 years after menophania and the full 3 year after menophania. And the pseudo-elliptic curve of correlative probability at this time is nearly round.

9) Comparing with the pseudo-elliptic curve of probability, both the age and the sexual years. I found that there is no difference between the two in the transverse axis of this pseudo-ellipse, that is, by the stoutness of thinness of the body and the size of the chest, but in the vertical axis, that is, by the growth of the body, the sexual years is smaller than the age. In other words, the dissolution degree of height, weight, and girth of the chest in the sexual years is smaller than the age.

10) The height of workers is inferior to students, but the weight, and girth of the chest, especially in girth of the chest, are superior. When students living in cities and are compared with those living in the country, the heights of both groups are almost the same, but the weight, and girth of the chest of those living in the rural districts are superior.

11) Disregarding the influence on growth by the Second World War, I found that growth was worst in 1946, after which there was seen a gradual improvement.

## REFERENCES

1. ARATANI, Y. *Keio Med.* **19**: 737, 1939, (Japanese).
2. ARATANI, Y. *Racical Hygiene* **7**: 139, 1939, (Japanese).
3. HIRATA, K. *New Theory for the Physical Judgement and Its Practical Application*. Nagoya: Nagoya University Press, 1947, (Japanese).
4. HIRATA, K. *The Statistical Method in Curvilinear Co-Ordinates Fashion*. Nagoya: Nagoya University Press, 1948, (Japanese).
5. HIRATA, K. *New Judgement Fashion in Pupils*. Nagoya: Nagoya University Press, 1948, (Japanese).
6. HIRATA, K. *The Enforcement and Application of Physical Examination in School and a Point of the Statistical Report*. Nagoya: Nagoya University Press, 1948, (Japanese).
7. HATA, N. *Keio Med.* **15**: 983, 1933, (Japanese).
8. ISHIZAWA, S. *Fukuoka med. J.* **39**: 172, 1948, (Japanese).
9. MATSUBAYASHI, I. *Racical Hygiene* **2**: 5, 1929, (Japanese).
10. MATSUYAMA, N. *J. Obs. and Gyn.* **4**: 535, 1929, (Japanese).
11. MARTIN, R. *Lehrbuch der Anthropologie* II. Berlin, 1928.
12. TAKEUCHI, S. *Tokyo med. J.* **46**: 2252, 1932, (Japanese).
13. TAKEUCHI, S. *Tokyo Women med. J.* **I**: 554, 1934, (Japanese).
14. TAKEUCHI, S. *Physique Res.* **3**: 706, 1936, (Japanese).
15. TACHINO, K. *Tokyo Women med. J.* **9**: 323, 1939, (Japanese).
16. YOSHIDA, K. *Keio Med.* **11**: 2443, 1931, (Japanese).