

## Physical Growth and Maturity Gradients of Certain Physical Traits in Rural Vadabalija Girls of North Coastal Andhra Pradesh, India

B. Dharma Rao and B.R. Busi

*Department of Anthropology, Andhra University, Visakhapatnam 530 003, Andhra Pradesh, India*

**KEY WORDS** Vadabalija. Anthropometry. Growth. Andhra Pradesh.

**ABSTRACT** A cross-sectional purposive random sample of 608 Vadabalija girls ranging in age from 1 through 20 years were selected to study the growth patterns and maturity gradients on the basis of height, body weight, upper arm circumference and triceps skinfold thickness. All these measurements increase with increase in age except skinfold thickness.

In the present study an attempt has been made to study the effect of age from 1 through 20 years on four physical traits of rural and fishing Vadabalija girls.

### MATERIAL AND METHODS

Vadabalija is one of the nine important fishing communities found in the North-East Coastal tract of Andhra Pradesh. The total number of fishermen of the State is about 25 lakhs of which the Vadabaliyas constitute 18 percent (Swamy, 1971, *c.f.* Subba Rao, 1980). The material of the present study was based on a cross-sectional data collected on 608 Vadabalija girls from 11 villages of Bheemunipatnam and Anandapuram *Mandals* of Visakhapatnam district of Andhra Pradesh State during the months of January, 1986 to June, 1987. The ages of these subjects range from 1 to 20 years. The age of each individual was calculated to three decimal places after Tanner et al. (1966). The measurements—body weight, stature, upper arm circumference and triceps skinfold were taken after Weiner and Lourie (1969).

### RESULTS AND DISCUSSION

It has been observed that the mean values for all body measurements except skinfold thick-

nesses, increase with advancement in age. The mean height of infant at 1 year was about 60 cm. The height doubled by 9 years, two and half times by 15 years. An increment of 6 cm. was noticed from 16 to 20 years. The mean weight of infant at 1 year was 5 kg., it was doubled by 3 years, three times by 6 years, about 5 times by 11 years and 9 times by 20 years. The mean upper arm circumference of infant at 1 year was 12 cm. It was doubled by 20 years. The mean values of these physical traits are found to increase with advancement of age. Fat-fold thickness at triceps region increase at a slow rate from age 1 with advancing ages till 3 years. Then it decreases to 8 years; and then it gradually increases from 9 to 17 years, and after that it gradually decreases through 18, 19 and finally at 20 years (Table 1).

All measurements show minimum maturity at 1 year and maximum at 19 years age group except triceps skinfold (139.12%) which is maturing earlier (at 17 years) than the height, weight and upper arm circumference. The height (99.99%) maturing earlier than weight (99.96%) and upper arm circumference (99.96%); yet to achieve of both weight and upper arm circumference is the same (0.04%) and it is more than that of height (0.01%). The maturity gradient of height, weight and upper arm circumference is visibly suggestive of the cephalo-caudal grad-

ient of growth. On the other hand triceps skinfold thickness as compared with height indicates of caudo-cephalic (*i.e.* reversal of cephalocaudal) gradient of growth. Perhaps this is the reason why Tanner (1964) speaks of the 'smaller area-gradients' (as) being 'more complicated'. Tan-

ner's expression, 'more complicated' is now to be viewed in the sense of 'caudo-cephalic gradients' instead of 'cephalo-caudal gradients'. This may, for the sake of bravery, be called 'reversal phenomenon' (Table 1).

It will be apparent from the foregoing results

Table 1: Mean and standard deviation of four anthropometric measurements and maturity gradients among Vadabalija females of Andhra Pradesh

| Age<br>(in<br>Years) | N  | Height (cm) |      |          | Weight (kg) |      |          | Upper arm<br>circumference (cm) |      |          | Triceps<br>skinfold (mm) |      |          |
|----------------------|----|-------------|------|----------|-------------|------|----------|---------------------------------|------|----------|--------------------------|------|----------|
|                      |    | X           | S.D. | Gradient | X           | S.D. | Gradient | X                               | S.D. | Gradient | X                        | S.D. | Gradient |
| 1                    | 57 | 60.06       | 5.86 | 38.40    | 5.41        | 1.44 | 11.42    | 12.15                           | 1.62 | 53.29    | 8.11                     | 2.18 | 90.91    |
| 2                    | 41 | 72.65       | 5.25 | 46.45    | 8.28        | 1.58 | 17.48    | 13.41                           | 0.98 | 58.81    | 9.08                     | 2.16 | 101.79   |
| 3                    | 40 | 81.19       | 4.26 | 51.91    | 10.20       | 1.07 | 21.53    | 13.72                           | 0.77 | 60.17    | 9.82                     | 1.99 | 110.08   |
| 4                    | 35 | 87.63       | 4.76 | 56.02    | 11.93       | 1.28 | 25.18    | 14.13                           | 0.88 | 61.97    | 9.80                     | 1.95 | 109.86   |
| 5                    | 42 | 97.38       | 5.78 | 62.26    | 13.83       | 1.31 | 29.19    | 14.32                           | 0.84 | 62.80    | 8.38                     | 1.73 | 93.94    |
| 6                    | 42 | 106.25      | 5.41 | 67.93    | 15.93       | 1.85 | 33.67    | 14.43                           | 0.81 | 63.29    | 7.38                     | 1.34 | 82.73    |
| 7                    | 35 | 110.26      | 4.97 | 70.50    | 17.23       | 1.72 | 36.37    | 15.03                           | 1.02 | 65.92    | 7.47                     | 1.89 | 83.74    |
| 8                    | 37 | 116.08      | 5.76 | 74.21    | 19.04       | 2.08 | 40.19    | 15.40                           | 0.94 | 67.54    | 6.92                     | 1.44 | 77.58    |
| 9                    | 39 | 122.95      | 4.30 | 78.61    | 21.46       | 1.85 | 44.41    | 15.85                           | 0.82 | 69.51    | 7.39                     | 1.89 | 82.85    |
| 10                   | 34 | 127.63      | 4.93 | 81.60    | 24.09       | 2.47 | 50.85    | 16.38                           | 1.15 | 71.84    | 7.51                     | 2.93 | 84.19    |
| 11                   | 30 | 131.28      | 5.48 | 83.94    | 25.57       | 2.31 | 53.98    | 16.77                           | 1.04 | 73.55    | 7.52                     | 1.66 | 84.30    |
| 12                   | 30 | 135.69      | 5.21 | 86.76    | 27.45       | 3.53 | 57.95    | 17.46                           | 1.07 | 76.58    | 7.00                     | 1.43 | 78.47    |
| 13                   | 29 | 142.04      | 5.43 | 90.81    | 30.90       | 3.63 | 65.23    | 18.13                           | 1.28 | 79.51    | 7.26                     | 1.90 | 81.39    |
| 14                   | 25 | 146.58      | 3.59 | 93.72    | 37.04       | 4.47 | 78.19    | 20.06                           | 1.74 | 87.98    | 8.88                     | 2.61 | 99.55    |
| 15                   | 21 | 151.09      | 5.77 | 96.60    | 41.14       | 4.04 | 86.85    | 20.94                           | 1.28 | 91.84    | 8.96                     | 2.19 | 100.45   |
| 16                   | 19 | 154.36      | 4.61 | 98.69    | 43.95       | 2.80 | 92.78    | 21.45                           | 1.17 | 94.08    | 8.68                     | 2.45 | 97.30    |
| 17                   | 13 | 155.24      | 2.90 | 99.26    | 46.58       | 3.71 | 98.33    | 22.61                           | 1.68 | 99.17    | 12.41                    | 3.22 | 139.12   |
| 18                   | 14 | 156.13      | 6.61 | 99.83    | 47.18       | 3.83 | 99.60    | 22.77                           | 1.68 | 99.87    | 10.41                    | 3.31 | 116.70   |
| 19                   | 13 | 156.38      | 7.04 | 99.99    | 47.35       | 6.50 | 99.96    | 22.79                           | 1.17 | 99.96    | 8.18                     | 2.11 | 91.70    |
| 20                   | 12 | 156.40      | 6.51 | -        | 47.37       | 4.29 | -        | 22.80                           | 1.43 | -        | 8.92                     | 1.47 | -        |

that the Vadabalija girls show more or less similarity in height and body weight to that of Maharashtrian girls (Sharma, 1970). Vadabalija girls are shorter in height when compared to ICMR (1984); Gaddi Rajput girls (Singh, 1980).

## REFERENCES

- ICMR: *Growth and Physical Development of Indian infants and Children*. ICMR Technical Report Series No. 18 (1984).
- Sharma, J.C.: *Physical Growth and Development of Maharashtrians*, Ethnographic & Folk Culture Society, Lucknow, 1-40 (1970).
- Singh, S.P.: *Physical growth of Gaddis Rajputs of Dhaul*
- Dhar range of the Himalayas, *Z. Morph. Anthropol.*, 71: 65-81 (1980).
- Subba Rao, N.: Socio-economic and cultural profiles of a coastal fishing village in Andhra Pradesh. *Man in India*, 60: 221-234 (1980).
- Tanner, J.M.: Human growth and constitution, pp. 289-397. In: *Human Biology*. G.A. Harrison, J.S. Weiner, J.M. Tanner and N.A. Bamicot, (Eds). Oxford University Press, London (1964).
- Tanner, J.M., Whitehouse, R.H. and Takaishi, M.: Standards from birth to maturity for height, weight, height velocity and weight velocity. *British Children*, 1965. *Arch. Dis. Child.*, 41: 454-471, 613-635 (1966).
- Weiner, J.S. and Lourie, J.A.: *Human Biology: A Guide to Field Methods*, IBP Handbook No. 9, Blackwell, Oxford and Edinburgh (1969).