

Comparative Evaluation of Proportionate Growth Characteristics of Certain Selected Measurements Among Yadava and 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

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ABSTRACT This is the first comprehensive proportionate growth study of female children of Yadava and Vadabalija parentage. The cross-sectional proportional growth survey was undertaken in rural educational institutions situated in the Visakhapatnam district during 1986 and 1987. The sample consisted of 632 Yadava and 608 Vadabalija healthy girls aged 1 to 20 years. In this paper proportionate growth of four linear and transverse measurements were presented including patterns of change with increase in age. Statistical significant differences were observed in some age groups among these two groups.

The proportionate growth characteristics have been studied by Sharma (1970), Krishna Rao (1981), Martorell et al. (1988), but comparative studies of populations engaged in different occupational groups are negligible. Keeping this in mind, in the present study an attempt has been made to study the differential growth patterns of agricultural Yadava and fishing Vadabalija girls from 1 to 20 years.

MATERIAL AND METHODS

The Yadavas (Gollas) of Andhra Pradesh are predominantly a pastoral community occasionally engaged in farming. Vadabalija was one of the nine important fishing communities found in the North-East Coastal tract of Andhra Pradesh. Data were collected, cross-sectionally, on 632 Yadava and 608 Vadabalija girls aged 1 to 20 years, from 23 villages of Bheemuni-patnam and Anandapuram mandals of Visakhapatnam district of Andhra Pradesh during January, 1986 to June, 1987. The exact date of birth was collected for every subject either from the concerned school registers or from birth records of the village panchayats.

The age of each individual was calculated to three decimal places after Tanner et al. (1966).

The measurements on individual were taken during the working hours of the schools from 9 A.M. to 12.10 P.M. and 1.30 P.M. to 3.40 P.M. with minimum clothing. All bilaterally represented measurements were taken on the left hand side of the subject. The measurements - sitting height, height of anterior iliac spine, total arm length, antero posterior chest, transverse chest, biacromial diameter and biilio-cristal diameter were taken after Weiner and Lourie (1969).

RESULTS AND DISCUSSION

Proportionate growth characteristics of biiliocrystal diameter *versus* biacromial diameter, antero-posterior chest *versus* transverse chest, total arm length *versus* height of anterior iliac spine; and height of anterior iliac spine *versus* sitting height and significant differences by age among Yadava and Vadabalija girls have been depicted in tables 1 to 4. The adolescent growth spurt of proportionate growth was not clear as that of physical growth in both the groups.

Table 1 : Proportionate growth characteristics of bilioocrisal *versus* Biacromial diameter and significant differences by age among Yadava and Vadabalija girls

Yadava				Age (in years)	Vadabalija				Comparison 't' value
N	$\bar{X}$	S.D.	S.E.		N	$\bar{X}$	S.D.	S.E.	
50	78.33	7.13	1.01	1	57	85.65	8.24	1.09	4.95 ³
40	78.71	8.89	1.40	2	41	80.46	8.57	1.34	0.90
36	76.37	7.44	1.24	3	40	78.36	5.56	1.04	1.24
40	74.41	4.32	0.68	4	35	77.28	5.38	0.91	2.53 ²
60	73.36	4.97	0.64	5	42	75.32	5.83	0.90	1.78 ¹
47	70.02	4.75	0.69	6	42	73.15	3.98	0.61	3.40 ³
47	70.26	5.38	0.78	7	35	73.75	4.03	0.68	3.39 ³
44	70.35	6.00	0.90	8	37	70.89	5.98	0.98	0.41
34	70.81	5.62	0.96	9	39	71.38	4.28	0.68	0.48
27	68.50	5.73	1.10	10	34	71.72	5.68	0.97	2.19 ¹
27	69.73	6.12	1.18	11	30	70.85	3.02	0.55	0.86
21	67.22	5.02	1.09	12	30	71.56	5.04	0.92	3.03 ³
35	69.65	6.29	1.06	13	29	70.63	4.53	0.84	0.68
18	70.34	4.73	1.11	14	25	71.83	3.51	0.70	1.15
28	70.27	6.21	1.17	15	21	71.58	4.63	1.01	0.85
20	69.96	4.14	0.92	16	19	71.16	4.53	1.04	0.86
21	70.41	5.59	1.22	17	13	71.26	5.57	1.54	0.86
11	70.49	6.01	1.81	18	14	71.47	6.16	1.65	0.29
13	70.54	6.87	1.90	19	13	71.59	6.89	1.91	0.39
13	70.38	2.72	0.75	20	12	71.56	6.49	1.87	0.58

1. Significant at 5% level

2. Significant at 1% level

3. Significant at 0.1% level

Table 2 : Proportionate growth characteristics of antero-posterior chest *versus* transverse chest and significant differences by age among Yadava and Vadabalija girls

Yadava				Age (in years)	Vadabalija				Comparison 't' value
N	$\bar{X}$	S.D.	S.E.		N	$\bar{X}$	S.D.	S.E.	
50	71.51	8.42	1.19	1	57	70.51	12.85	1.70	0.48
40	72.43	8.51	1.34	2	41	71.25	9.78	1.53	0.58
36	72.09	9.54	1.59	3	40	75.41	8.91	1.41	1.57
40	76.10	6.04	0.95	4	35	76.98	7.05	1.19	0.58
60	77.56	4.66	0.60	5	42	78.47	5.30	0.82	0.88
47	78.12	5.61	0.82	6	42	76.99	3.48	0.54	1.15
47	77.06	4.99	0.73	7	35	77.15	4.64	0.78	0.07
44	76.02	5.81	0.87	8	37	76.33	4.50	0.74	0.27
34	75.15	5.43	0.93	9	39	74.66	4.18	0.67	0.43
27	74.96	5.76	1.11	10	34	75.70	5.14	0.88	0.52
27	74.75	5.20	1.00	11	30	74.94	4.64	0.85	0.11
21	74.37	6.61	1.44	12	30	75.50	4.13	0.75	0.70
35	74.63	5.90	1.00	13	29	73.98	4.92	0.91	0.48
18	75.92	5.67	1.34	14	25	74.52	3.83	0.77	0.90
28	76.23	6.30	1.19	15	21	74.85	4.27	0.93	0.92
20	77.15	4.65	1.04	16	19	76.42	5.32	1.22	0.45
21	78.25	6.36	1.39	17	13	77.16	5.46	1.51	0.53
11	78.08	5.50	1.66	18	14	77.41	5.37	1.43	0.30
13	77.81	7.02	1.95	19	13	77.47	4.09	1.13	0.15
13	77.88	6.10	1.69	20	12	77.16	3.96	1.14	0.35

Table 3 : Proportionate growth characteristics of total arm length *versus* height of anterior iliac spine and significant differences by age among Yadava and Vadabaliya girls

Yadava				Age (in years)	Vadabaliya				Comparison 't' value
N	X	S.D.	S.E.		N	X	S.D.	S.E.	
50	91.46	4.80	0.68	1	57	91.58	5.55	0.73	0.12
40	87.11	6.61	1.04	2	41	86.89	4.93	0.77	0.17
36	82.39	3.01	0.50	3	40	82.67	5.82	0.92	0.27
40	79.02	3.45	0.54	4	35	79.46	4.98	0.84	0.44
60	76.83	2.45	0.32	5	42	78.07	3.81	0.59	1.85 ¹
47	77.17	3.22	0.47	6	42	76.60	2.91	0.45	0.88
47	75.35	2.68	0.39	7	35	77.53	4.43	0.75	2.58 ²
44	75.70	2.51	0.38	8	37	76.28	4.02	0.66	0.76
34	75.59	2.44	0.42	9	39	76.08	2.20	0.35	0.89
27	75.75	3.42	0.66	10	34	75.42	1.95	0.33	0.44
27	76.21	3.00	0.58	11	30	75.26	1.97	0.36	1.39
21	74.57	1.48	0.32	12	30	75.47	2.48	0.45	1.63
35	75.81	2.34	0.39	13	29	76.45	7.96	1.48	0.41
18	77.16	1.42	0.33	14	25	76.93	3.77	0.75	0.28
28	77.23	2.28	0.43	15	21	77.48	2.71	0.59	0.34
20	77.02	3.27	0.73	16	19	77.63	1.65	0.38	0.74
21	76.86	2.58	0.56	17	13	76.47	3.80	1.05	0.32
11	76.18	2.88	0.87	18	14	76.29	2.74	0.73	0.09
13	77.22	1.97	0.55	19	13	76.33	3.02	0.84	0.88
13	77.14	2.30	0.64	20	12	76.39	3.46	1.00	0.63

1. Significant at 5% level

2. Significant at 1% level

Table 4 : Proportionate growth characteristics of height of anterior iliac spine *versus* sitting height and significant differences among Yadava and Vadabaliya girls

Yadava				Age (in years)	Vadabaliya				Comparison 't' value
N	X	S.D.	S.E.		N	X	S.D.	S.E.	
50	70.43	5.99	0.85	1	57	72.46	7.31	0.97	-1.57
40	80.28	5.51	0.87	2	41	80.77	5.58	0.87	0.39
36	86.95	5.96	0.99	3	40	88.13	6.03	0.95	0.86
40	95.51	5.02	0.79	4	35	94.10	6.02	1.02	1.09
60	100.33	5.47	0.71	5	42	100.39	5.74	0.88	0.05
47	102.76	5.39	0.79	6	42	103.18	5.71	0.88	0.35
47	107.29	4.74	0.69	7	35	103.61	6.30	1.06	2.89 ³
44	111.85	6.38	0.96	8	37	109.37	5.81	0.95	1.83 ¹
34	111.20	4.57	0.78	9	39	112.72	5.46	0.87	1.31
27	112.24	5.28	1.02	10	34	114.87	5.53	0.95	1.89 ¹
27	115.49	3.92	0.75	11	30	116.33	5.16	0.94	0.40
21	119.62	4.52	0.99	12	30	118.29	5.89	1.07	0.91
35	117.23	5.28	0.89	13	29	117.84	4.74	0.88	0.48
18	118.00	4.86	1.14	14	25	117.76	8.22	1.64	0.12
28	116.13	5.16	0.97	15	21	117.15	6.46	1.41	0.59
20	115.71	5.09	1.14	16	19	117.47	4.29	0.98	1.17
21	115.65	4.17	0.91	17	13	118.63	6.49	1.80	1.47
11	116.32	5.85	1.76	18	14	118.61	8.97	2.40	0.77
13	116.80	5.12	1.42	19	13	118.36	5.53	1.53	0.75
13	116.90	5.17	1.43	20	12	118.36	8.75	2.52	0.57

1. Significant at 5% level

3. Significant at 0.1% level

The proportionate growth of biiliocrystal *versus* biacromial diameter, total arm length *versus* height of anterior iliac spine were declined with advancing age (Tables 1 and 3) in both the groups.

On the contrary antero-posterior chest *versus* transverse chest, height of anterior iliac spine *versus* sitting height, were increased with advancing age (Tables 2 and 4) in both the groups.

When 't' test comparison is made between Yadava and Vadabaliya girls by age wise means of 1 to 20 years, significant differences are observed in 1,4,5,6,7,10 and 12 years of biiliocrystal *versus* biacromial diameter 5 and 7 years of total arm length *versus* height of anterior iliac spine and the remaining combinations and age groups were not significant.

The mean values of proportionate growth characteristics were more or less similar to that of Maharashtrians (Sharma, 1970).

The growth differences observed between the Yadava and Vadabaliya girls need to be explained at this juncture. The social status of both the caste groups in the prevailing Hindu caste system is low. The Vadabaliya community in particular is very poor, their occupation (fishing) is not as dignified as that of the Yadavas (agriculturists), they occupy a low position in the society, living mostly outside the villages, and are educationally backward. Both the groups are of lower income groups. The factors associated with socio-economic environment may play a role in limiting growth potential throughout the growth period. The socio-economic status of Yadava community is considerably better than the Vadabaliya. However, owing to the occupation it is obvious that Vadabalijas have easy access to and may consume fish and other sea food abundantly as also shown by other studies (Busi et al., 1987). This high consumption of protein rich food of Vadabalijas may have resulted in better growth.

Regarding the genetic differences, both Yadava and Vadabalijas are reproductively isolated from one another and also strictly en-

dogamous. Raja Rajeswari (1988) in her study observed some difference between these two communities in their demographic, genetic and other characters. These inherent genetic factors affecting the velocity of growth which give the Vadabaliya girls a characteristic cross-sectional growth patterns in many variables which is quantitatively different from that observed in Yadava girls. This would be consistent with what is known of genetic factors affecting growth and development (Tanner, 1962) and comparative growth studies of different ethnic groups (Eveleth and Tanner, 1976).

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