PRINT: ISSN 0970-9274 ONLINE: 2456-6608
DOI: 10.31901/24566608.1990/01.02.06

JOURNAL OF
HUMAN ECOLOGY

J. Hum. Ecol. (1990) 1 (2):169-174

Somatotype Changes in Adolescence Among Dogras of Jammu and Kashmir, India

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KEY WORDS Adolescence. Somatotype. Dogras. Jammu and Kashmir.

ABSTRACT In the present study the changes in somatotype components of three Dogra population groups of Jammu district have been investigated. Anthropometric data on 724 Dogra boys ranging from 8+ to 18+ years have been collected in 1989. The sample comprised of 226 Dogra Brahmans, 236 Dogra Rajputs and 262 Scheduled Caste boys. Each subject has been somatotyped using Heath and Carter anthropometric method. The somatotype components of all the three population groups do not change with age. In all the three population groups, mesomorphic—ectomorph component which is dominant at 8+ continues to be so till 18+ years of age. There is not much change in the somatotype ratings during adolescence.

INTRODUCTION

Numerous studies have been conducted using Heath-Carter anthropometric method (1967). Earlier studies conducted by Sheldon et al. (1940, 1950, 1969) advocated the stability of somatotype and assumed somatotype to follow a definite pathway. On the contrary, most of the recent studies report that somatotypes do change, with age especially during adolescence, when it undergoes a component dominance change (Hunt and Barton, 1959; Barton and Hunt, 1962; Heath and Carter, 1971; Parizkova and Carter, 1976 and Singh S.P. and Sidhu, 1980). Indian population studies so far show that they are ectomorph; endoectomorph or mesoectomorphic and their component ratings considerably lower than their Western counterparts (Malcolm, 1970; Heath and Carter, 1971; Parizkova and Carter, 1976; Singh, S.P. and Sidhu, 1980; Singh, L.P., 1987). Keeping in mind the somatotype changes in adolescence, various Dogra population groups are reported in the present study.

MATERIAL AND METHODS

The present study is based on a cross-sectional sample of 724 Dogra boys of Jammu district of Jammu and Kashmir, ranging from 8+ to 18+ years of age. 226 Dogra Brahmans, 236 Dogra Rajputs and 262 Dogra Scheduled Castes boys were studied in 1989. For the purpose of analysis, the subjects were classified into yearly intervals. Subjects between age 8.00 to 8.99 years of age were grouped into 8+. A similar pattern was followed in other age groups. The individuals selected for the study were normal, apparently healthy, unrelated subjects selected at random. The sample was drawn mostly from educational institutes and a subject's date of birth was confirmed from the school records. The anthropometric measurements were taken following the techniques described by Singh I.P. and Bhasin (1968) and Weiner and Lourie (1969). The anthropometric somatotype, has been calculated using Heath-Carter method (Carter, 1975).

RESULTS AND DISCUSSION

The results of the present study are represented in the Table 1. It has been observed that among the various groups of Dogras no regular trend has been observed.

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Table 1: Somatotype components (endomorphy, mesomorphy and ectomorphy) Among Dogra Brahmans, Dogra Rajputs and Dogra Scheduled Castes of Jammu and Kashmir

Age Years	Brahmans			Dogra Rajputs			Scheduled Castes		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
ENDOMORPHY (I)									
8+	21	1.78	0.30	24	1.76	0.29	22	1.73	0.37
9+	19	1.95	0.37	20	1.72	0.43	17	1.59	0.26
10+	20	1.82	0.60	27	1.60	0.41	33	1.73	0.44
11+	20	1.63	0.45	22	1.68	0.45	32	1.80	0.80
12+	23	1.34	0.30	21	1.67	0.52	22	1.30	0.38
13+	20	1.49	0.48	20	1.78	0.96	27	1.43	0.44
14+	21	1.59	0.43	22	1.58	0.35	25	1.36	0.27
15+	22	1.67	0.74	22	1.42	0.40	25	1.45	0.52
16+	20	1.71	0.48	20	1.51	0.36	21	1.40	0.34
17+	20	1.65	0.43	20	1.78	0.81	20	1.60	0.44
18+	20	1.57	0.50	18	1.82	0.69	18	1.71	0.65
MESOMORPHY (II)									
8+	21	3.68	0.65	24	2.89	0.82	22	3.49	0.97
9+	19	3.02	0.63	20	3.18	0.50	17	3.03	0.63
10+	20	3.19	0.56	27	2.93	0.67	33	2.99	0.60
11+	20	2.78	0.81	22	2.95	0.55	32	2.60	1.20
12+	23	2.52	0.65	21	2.96	0.83	22	2.61	0.65
13+	20	2.91	0.92	20	3.02	0.90	27	2.36	0.94
14+	21	2.70	0.70	22	3.03	0.89	25	2.49	0.66
15+	22	2.83	0.92	22	2.52	1.16	25	2.56	0.56
16+	20	2.47	1.22	20	2.99	0.85	21	2.62	0.82
17+	20	2.60	1.14	20	3.17	0.93	20	2.79	0.87
18+	20	2.44	1.46	18	3.66	1.05	18	3.18	0.90
ECTOMORPHY (III)									
8+	21	5.26	0.66	24	5.29	0.90	22	4.71	1.11
9+	19	4.92	0.73	20	4.79	0.91	17	5.20	0.92
10+	20	5.12	1.02	27	5.45	0.91	33	5.34	1.05
11+	20	5.08	1.13	22	5.36	0.69	32	5.65	1.17
12+	23	5.70	1.03	21	5.50	1.08	22	5.88	0.70
13+	20	5.68	1.28	20	5.31	1.36	27	6.08	1.38
14+	21	5.49	0.87	22	5.38	1.16	25	5.62	0.86
15+	22	5.16	1.20	22	5.72	1.18	25	5.29	1.37
16+	20	5.50	1.17	20	5.25	1.03	21	5.29	1.14
17+	20	5.41	1.41	20	4.82	1.19	20	5.67	1.01
18+	20	5.92	1.23	18	4.60	1.27	18	4.67	1.35

a) *Endomorphy:* In Dogra Brahmans, endomorphy increases from 12+ to 15+ years and decreases thereafter, while in Dogra Rajputs increase is seen from 10+ to 13+ years, followed by subsequent decrements. In Dogra Scheduled Castes, endomorphy increases regularly from 8+ to 18+ years with the exception of 12+ years (Table 1).

b) *Mesomorphy:* In mesomorphy, different trends have been observed for three Dogra groups. In Dogra Brahmans and Scheduled Castes, mesomorphy decreases from 8+ to 12+ years, whereas in Dogra Rajputs, it shows more or less regular increment from

8+ to 14+ years. In Dogra Brahmans, a regular decrement has been observed from 13+ years onwards. Dogra Scheduled Castes show more or less regular increment for the corresponding period. In Dogra Rajputs a regular increment is seen after 15+ years (Table 1).

c) *Ectomorphy:* Ectomorphy decreases from 8+ to 11+ years and from 8+ to 13+ years for Dogra Brahmans and Rajputs respectively; while it shows increments for Dogra Scheduled Castes for the corresponding period. It increases from 12+ to 13+ years in Dogra Rajputs, while it decreases during the corresponding period in Dogra Brahmans. Dogra Scheduled Castes show a regular rise from 14+ years onwards and from 15+ years onwards a regular increment is seen in Dogra Brahmans and Rajputs (Table 1).

No regular spurt corresponding to adolescent growth spurt has been observed in somatotype components. Statistically non-significant differences have been observed in inter-group age intervals.

A look at the mean somatotype values show a very interesting trend in somatotype ratings in the order: 'first component is lower than the second, while the third component ratings are higher than the first and second components' (Table 1).'

According to the system of sector division of somatochart (Carter, 1975), all the individual values lie in mesomorphic ectomorph sector (Figs. 1, 2 and 3).

The somatotype components show that the population groups under study, which are mesomorphic-ectomorph at 8+ years continues so till 18+ years without showing any component dominance change. The change in component dominance has been reported by various authors (Parizkova and Carter 1976; Walker, 1978), whereas Tanner (1970) reported that there is not much change in somatotype ratings during the course of growth. The present findings are in line with Tanner's (1970) findings that no major component change takes place in children during the adolescence phase. Since in most of the cases, somatotype components change from half unit to one unit, so it may be concluded that there is not much change in somatotype ratings during growth phase.

Somatotype Attitudinal Distance (SAD) and Somatotype Dispersion Distance (SDD) have been calculated after Carter (1975). In Dogra Brahmans the highest value of SAD has been observed between 11+ and 12+ years (SAD=0.73) and minimum value between 16+ and 17+ years (SAD = 0.16). The highest and the lowest value of SAD has been observed between 9+ and 10+ years (SAD = 1.08), between 17+ and 18+ years (SAD = 1.07) and between 11+ and 12+ years (SAD = 0.14) and between 15+ and 16+ years (SAD = 0.07), for Dogra Rajputs and Scheduled Castes (Table 2).

Somatotype Dispersion Distance (SDD) has been calculated for obtaining distances between pairs of average somatotype plots. The highes value of SDD has been observed between 11 - 12+ years (SDD = 2.02) and the lowest betwe 13+ - 14+ years (SDD = 0.60). For Dogra R puts and Scheduled Castes, the highest and t lowest values of SDD have been obsery between 8+ - 9+ years (SDD = 2.05); 17+ - 1 years (SDD = 2.23) and between 13+ - 14+ (SI = 0.49); 16+ - 17+ (SDD = 0.49) years resp tively (Table 2).

In order to quantify the changes between s cessive years for mean somatotype, the mi tory distance (MD) has been calculated, wl is the sum of the SDD's between succes somatotype means from 8+ to 18+ are 1(12.19 and 12.42 respectively for Dogra B mans, Rajputs and Scheduled Castes (Tabl

Somatotype components of Dogra Brahm Rajputs and Scheduled Castes have been c pared with Brahmins and Rajputs of Chamba Gaddi Rajputs of Bharmour tehsil of Cha district (H.P.) (Singh. S.P. and Sidhu, 1980; Singh L.P., 1987). Dogra Brahmans, Rajputs Scheduled Castes show lower endomorphy Brahmins and Rajputs of Chamba, Gaddi

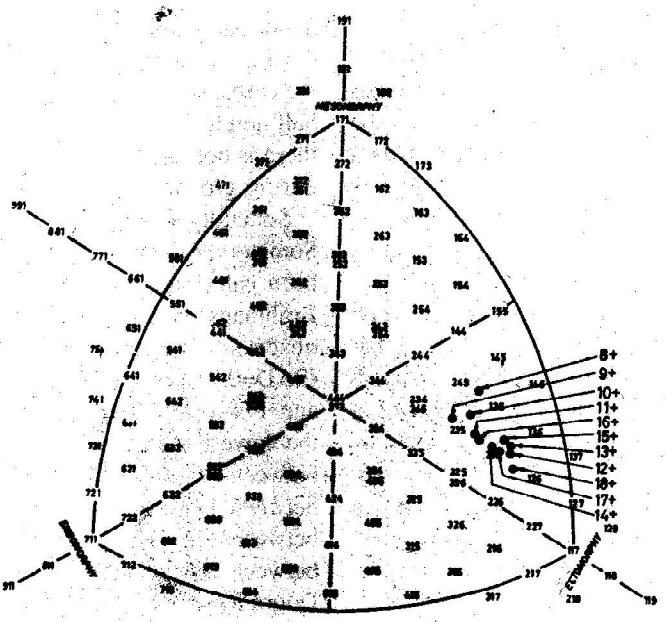

Fig. 1: Somatochart showing Somatotype distribution in Dogra Brahmans of Jammu district, J & K for Various Age Groups

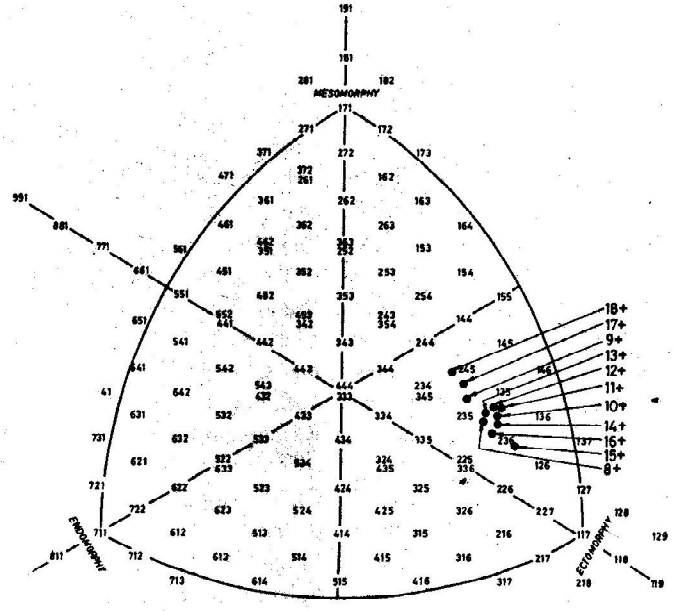

Fig. 2: Somatochart showing Somatotype distribution in Dogra Rajputs of Jammu district, J & K for Various Age Groups

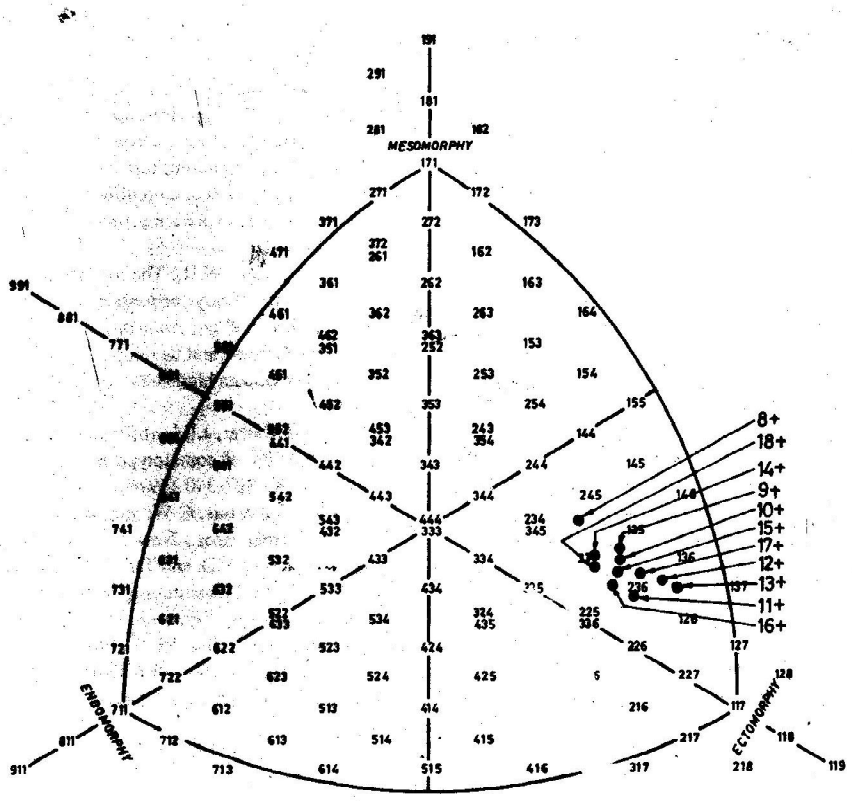

Fig. 3: Somatochart showing Somatotype distribution in Dogra Scheduled Castes of Jammu district, J & K for Various Age Groups

Table 2: Somatotype Attitudinal Distance (SAD), Somatotype Dispersion Distance (SDD) and Migratory Distance (MD) between Dogra Brahmans, Rajputs and Scheduled Castes of Jammu district, Jammu and Kashmir

Age Interval	*SOMATOTYPE ATTITUDINAL DISTANCE*			*SOMATOTYPE DISPERSION DISTANCE*		
	Brahman	*Rajput*	*Scheduled Caste*	*Brahman*	*Rajput*	*Scheduled Caste*
8+ - 9+	0.76	0.57	0.98	1.24	2.05	1.27
9+ - 10+	0.29	1.08	0.20	0.82	1.70	0.76
10+ - 11+	0.45	0.12	0.75	0.81	1.30	1.17
11+ - 12+	0.73	0.14	0.73	2.02	0.47	1.59
12+ - 13+	0.41	0.22	0.34	0.71	0.83	1.87
13+ - 14+	0.30	0.21	0.83	0.60	0.49	1.31
14+ - 15+	0.38	0.85	0.67	1.20	1.47	0.82
15+ - 16+	0.52	0.96	0.07	1.30	1.40	0.91
16+ - 17+	0.16	0.84	0.75	0.27	1.48	0.49
17+ - 18+	0.54	0.53	1.07	1.54	1.00	2.23
			Migratory Distance	10.15	12.17	12.42

puts of Bharmour show almost similar endomorphy with Dogra Scheduled Castes. Dogra Brahmans show lower endomorphy at some intervals and higher endomorphy at other intervals than Gaddi Rajputs. Dogra Scheduled Castes show lower endomorphy than Chamba Brahmins and Rajputs, while comparable ratings are shown with Gaddi Rajputs of Bharmour. The general trend is that Chamba Brahmins and Chamba Rajputs are more mesomorphic than the Dogra propulation groups, while Gaddi Rajputs of Bharmour rate lower than the Dogra population groups of Jammu. All the three Dogra population groups under study are higher in ectomorphy than Chamba Brahmins, Rajputs and Gaddi Rajputs of Bharmour.

The general conclusion is that contrary to most of the studies reported from the region showing that somatotype changes in different component dominance during adolescence, whereas in the present study the somatotype remains in one component dominance stage; similar findings have been reported by Tanner (1970).

ACKNOWLEDGEMENTS

The financial assistance is provided by the Ministry of Environment and Forests, Government of India, New Delhi for the project entitled 'Environment, Human Settlements and Human Activities in Jammu and Kashmir Himalayas with special reference to Ladakh", under MAB (Man and Biosphere Programme, UNESCO). Ref. No. 14/122/84 RE MAB, under the guidance of Dr. M.K.Bhasin (Principal Investigator, Department of Anthropology, University of Delhi, Delhi-110 007).

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