

## Hand clasping types of a population from North-West Bulgaria

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The types of hand clasping of 841 Bulgarians from two age groups (14–18 years old and 30–39 years old) have been investigated in three territorial regions of North-West Bulgaria — the Vidin, Montana (Mihailovgrad) and Vratza regions. It was established that the l-type is prevalent in the population under study. The observed differences between the R-type and L-type with regard to sex, age and territorial distribution in the three regions of North-West Bulgaria have proven to be statistically insignificant.

*Key words:* hand clasping, functional asymmetry, R-type, L-type.

One of the tests for determining the functional asymmetry of the hands as an expression of the functional asymmetry of the brain in the human is the so-called hand clasping e.g. the crossing of the fingers of the hands.

Lutz was the first [11] to describe two ways of crossing to the hand fingers in a clasp. In the first case the right thumb is placed over the left one and is defined as the R-type in the other case it is the left thumb that is over and is defined as the L-type. Many authors have displayed an interest in that problem beginning from the dawn of the century till our day. The interest has been channelled mainly towards a clarification of the role of the factors determining the revealing of this trait and its relationship to other characteristics of the functional asymmetry of the brain. There is no informed opinion as to the nature of hand clasping though.

Like Lutz himself [11] many other authors later support the hypothesis of the genetic control over hand clasping [4, 5, 8, 12, 15]. Other authors claim that there is not good evidence for genetic control [3, 14]. L a i and W a l s h [9] assume it as a mere habit rather than a thing genetically pre-determined. L e g u e b e [10] envisages a combined influence of the factors in the assessment of the hand clasping types. P o n s [12], F r e i r e - M a i a and A l m e i d a [6] note a dependence between age and this feature. B e c k m a n and E l s t o n [1] do not find significant differences regard to sex as well as no record of regional variations. R h o a d s and D a m o n [13] do not establish any dependency on sex and age.

The start of studies of this kind was made B o e v and T o d o r o v [2] in our country who investigated 2638 individuals from three ethnic groups and find a much higher percentage of the R-type especially among Bulgarians compared to other

investigations. M u t a f o v [16] has explored a control group of 1500 healthy children where the L-type is predominant. Later K a r e v [7] studies 2100 students and also established a higher percentage for the L-type.

The comparatively small number of studies on hand clasping in our country and its unclarified character has set us on the path of carrying out this study. The purpose of the present study is to trace the frequency of the hand clasping types in the population from North-West Bulgaria depending on sex, age and residency.

## Material and Methods

A total of 841 Bulgarians of both sexes have been investigated who inhabit and descend from three territorial regions of North-West Bulgaria: the Vidin, Montana (Mihailovgrad) and Vratza areas. The studied individuals were distributed into two age groups: 1) 14–18 years old — encompasses 89 boys and 156 girls, all students; 2) 30–39 years old — encompasses 301 males and 295 women.

The investigation was carried out after the conventional methods [10, 13]. The statistical processing includes the per cent distribution of the hand clasping types and the  $\chi^2$  method.

## Results and Discussion

The L-type is prevalent both throughout the total population studied in North-West Bulgaria and among both sexes where the values are quite close (Table 1). The differences are statistically insignificant between the two types of hand clasping with regard to sex ( $\chi^2=0,001 < \chi^2_{0,05(1)}=3,84$ ). The L-type is predominant in both sexes from the three regions its percentage being highest among the males from Montana and Vratza women (Table 2). The differences, however, are statistically insignificant in

T a b l e 1. Per cent distribution of the hand clasping types amid a population of North-West Bulgaria according to sex

Sex	R-type		L-type		N
	n	%	n	%	
Men	172	44,10	215	55,13	390
Women	200	44,35	251	55,65	451
Total	372	44,23	466	55,41	841

T a b l e 2. Per cent distribution of the hand clasping types amid a population of North-West Bulgaria according to residency

Region	Sex	R-type		L-type		N
		n	%	n	%	
Vidin	men	62	46,97	68	51,52	132
	women	53	44,54	66	55,46	119
Montana	men	57	41,30	80	57,97	138
	women	99	46,70	113	53,30	212
Vratza	men	53	44,17	67	55,83	120
	women	48	40,00	72	60,00	120

both sexes (for the males  $\chi^2=1,01 < \chi^2_{0,05(2)}=5,99$  and for the women  $\chi^2=0,76 < \chi^2_{0,05(1)}=3,84$ ).

In the age group from 14 to 18 years of age the L-type is more frequent in both sexes the percentage being somewhat higher among the girls (Table 3). The differences between the R- and L-types with regard to the sex are statistically insignificant ( $\chi^2=0,65 < \chi^2_{0,05(1)}=3,84$ ). The L-type is also prevalent in the 30–39 years-of age group and is higher in frequency among males (Table 3). The differences here are again statistically insignificant ( $\chi^2=0,72 < \chi^2_{0,05(1)}=3,84$ ). 1% of the investigated males pose the thumbs of both hand parallel to each other when crossing fingers. Upon comparing the two age groups it was established that the R-type per cent is increased in the second age group without gaining prevalence over the per cent of the L-type, however. These changes in the percentage of the R- and L-types are statistically insignificant in both sexes, especially in the male group ( $\chi^2=0,76 < \chi^2_{0,05(1)}=3,84$ ), for women  $\chi^2=7,99 < \chi^2_{0,001(1)}=10,83$ . The established age differences in the two types of hand clasping are possibly related to the changes in the way of living during the next phases of the ontogenetical development of man (the type of occupation, professional qualification,

Table 3. Per cent distribution of the hand clasping types amid a population of North-West Bulgaria according to age group

Age group	Sex	R-type		L-type		N
		n	%	n	%	
14–18 years	men	36	40,45	53	59,55	89
	women	55	35,26	101	64,74	156
30–39 years	men	136	45,18	162	53,82	301
	women	145	49,15	150	50,85	295

Table 4. Per cent distribution of the hand clasping types amid a population of North-West Bulgaria according to residency in the corresponding age group of 14–18 years of age

Region	Sex	R-type		L-type		N
		n	%	n	%	
Vidin	men	13	37,14	22	62,86	35
	women	16	36,36	28	63,64	44
Montana	men	22	42,31	30	57,69	52
	women	37	35,92	66	64,08	103
Vratza	men	1	50,00	1	50,00	2
	women	2	25,00	7	77,78	9

Table 5. Per cent distribution of the hand clasping types amid a population of North-West Bulgaria according to residency in the corresponding age group of 30–39 years of age

Region	Sex	R-type		L-type		N
		n	%	n	%	
Vidin	men	49	50,52	46	47,42	97
	women	37	49,33	38	50,67	75
Montana	men	35	40,70	50	58,14	86
	women	62	56,88	47	43,12	109
Vratza	men	52	44,07	66	55,93	118
	women	46	41,44	65	58,56	111

etc). The L-type per cent is highest among the boys from the Vidin region and in the girls from the Vratza area (Table 4). The differences, however, are statistically insignificant in both sexes with respect to the territorial distribution (among boys  $\chi^2=0,30 < \chi^2_{0,05(2)} = 5,99$  and for the girls  $\chi^2=0,69 < \chi^2_{0,05(2)} = 5,99$ ). The R-type predominates in the males from the Vidin region and among the women from the Montana area (Table 5). The differences here are also statistically insignificant (for the males  $\chi^2=2,14 < \chi^2_{0,05(2)} = 5,99$  and for the women  $\chi^2=5,24 < \chi^2_{0,05(2)} = 5,99$ ). 2,06% from the males of the Vidin region and 1,16% from the Montana area place the thumbs of the two hands parallel to one another when crossing their fingers.

The data from the present study are quite close to the results from the investigations of Mutafov and Karev (Table 6).

T a b l e 6. Comparative data about the frequency of the hand clasping types

Population	Author	Sex	N	Hand clasping (%)	
				R-type	L-type
Bulgarians(North Bulgaria)	B o e v, T o d o r o v (1973)	men	397	66,25	33,75
		women	354	59,71	40,39
Bulgarians	M u t a f o v (1981)	men	797	46,04	53,95
		women	703	45,23	54,77
Bulgarians	K a r e v (1993)	men	1050	47,71	52,29
		women	1050	46,29	53,71
Bulgarians (North-West Bulgaria)	F i l c h e v a (present study)	men	390	44,10	55,13
		women	451	44,35	55,65

The following conclusions can be drawn on the basis of the obtained results:

1) The frequency of the hand clasping types in the studied population corresponds to the parameters of the Europid race.

2) The biological factors sex and age exert an insignificant influence on the per cent distribution of the hand clasping types.

3) Residency, as a complex of geographical and socio-economical factors, which in our case coincides with the origins of both the mother and father sides of the investigated individuals is also of insignificant influence on the hand clasping types.

4) Categorical conclusions about factors underlying manifestation of hand clasping would be made possible in large scale familial and longitudinal studies yet to be performed.

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