

CORRELATION MATRICES FOR PALMAR DERMATOGLYPHIC TRAITS IN TWINS

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Intraclass correlation values have been studied in a sample of 50 MZ and 50 DZ twins with respect to fourteen palmar dermatoglyphic metric traits in binary combinations. The results confirm the general trends already shown in singleton studies. The shape of the palmar surface does not appear to be significantly correlated with other metric traits. Generally speaking, a large independence has been found between the various traits.

Sapra (1971: unpublished doctoral thesis) examined linear correlation matrices between different palmar dermatoglyphic metric traits in 400 singletons of both sexes and found a high correlation between t-index and BHI^t and between b-perpendicular and c-perpendicular (see below for definitions).

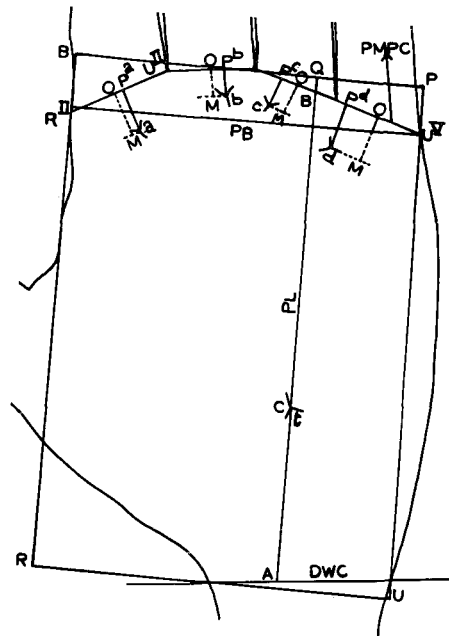
The study has now been extended to a twin sample. The following traits, as also shown on the Figure, have been analyzed in 50 MZ and 50 DZ adult twins from Poona (India) and also compared, where possible, with the data for singletons.

- VAR001. Palmarprint Form Index, $PFI = (\text{Palmar Breadth, PB})/(\text{Palmar Length, PL}) \times 100$.
- VAR002. Perpendicular Deviation for Digital Triradius d, or: d-perpendicular (cf. OM on the Figure).
- VAR003. c-perpendicular.
- VAR004. b-perpendicular.
- VAR005. a-perpendicular.
- VAR006. Modified Breadth-Height Index at Axial Triradius, $BHI^t = (\text{Projective PB})/[\text{Perpendicular upon PB (tQ) or Height}] \times 100$.
- VAR007. Intetriradial Distance ct.
- VAR008. t-Index = (Distance of Axial Triradius c from A)/(Length AB) $\times 100$.
- VAR009. Positional Index for Digital Triradius d, $PI^d = (R^v - p^d)/(R^v - U^v) \times 100$.
- VAR010. $PI^c = (R^{iv} - p^c)/(R^{iv} - U^{iv}) \times 100$.
- VAR011. $PI^b = (R^{iii} - p^b)/(R^{iii} - U^{iii}) \times 100$.
- VAR012. $PI^a = (R^{ii} - p^a)/(R^{ii} - U^{ii}) \times 100$.
- VAR013. Modified Positional Index at Axial Triradius, $PI^t = [\text{Radial shifting of t from radial limit of PB to the perpendicular projection of t(QB)}]/(\text{PB}) \times 100$.
- VAR014. Main-Line Index, MLI.

The results are shown in the Table and may be briefly summarized as follows.

PFI: Except for intertriradial distance ct in MZ and for BHI^t, most metric traits show a low correlation with PFI, thereby confirming previous results.

Perpendiculars: The four perpendiculars appear to be generally correlated to each other (in



Figure

Table. Correlation matrices of binary combinations of different metric traits in MZ & DZ twins and a series of unrelated males

	VAR001	VAR002	VAR003	VAR004	VAR005	VAR006	VAR007	VAR008	VAR009	VAR010	VAR011	VAR012	VAR013	VAR014
VAR001	MZ	—												
	DZ	—												
	MS	—												
VAR002	MZ	-0.2773												
	DZ	-0.1773												
	MS	-0.0580												
VAR003	MZ	+0.1621	+0.3840**											
	DZ	-0.1484	+0.2780**											
	MS	+0.0930	+0.4890**											
VAR004	MZ	-0.1488	+0.4872**	+0.3927**										
	DZ	-0.1493	+0.3010**	+0.3411**										
	MS	+0.0380	+0.4800**	+0.3181**										
VAR005	MZ	-0.1391	+0.5418**	+0.5182**	+0.5468**									
	DZ	-0.1883	+0.4381**	+0.3270**	+0.4968**									
	MS	+0.0470	+0.4320**	+0.3870**	+0.4270**									
VAR006	MZ	+0.3105**	+0.1635	-0.1163	-0.0817	-0.1044								
	DZ	+0.3887**	-0.2635	-0.2371	-0.2882	-0.2510								
	MS	—	—	—	—	—								
VAR007	MZ	-0.3639**	+0.8218**	+0.3385**	+0.3772**	+0.4342**	-0.8451**							
	DZ	-0.2356	+0.4840**	+0.3760**	+0.5330**	+0.5323**	-0.5021**							
	MS	—	—	—	—	—	-0.5018**							
VAR008	MZ	-0.0944	-0.1481	-0.0996	-0.1328	-0.0467	+0.6310**	-0.5018**						
	DZ	-0.0767	-0.2081	-0.1754	-0.1866	-0.1853	+0.4300**	-0.4186**						
	MS	+0.1630	+0.0490	+0.0430	+0.0120	+0.0310	+0.7130**	—						
VAR009	MZ	-0.0906	+0.0372	+0.0340	+0.0189	-0.0966	-0.1778	+0.0544	-0.1682					
	DZ	-0.1331	+0.2276	+0.1683	+0.1684	-0.0068	-0.2067	+0.0180	-0.1580					
	MS	-0.0940	+0.3270**	+0.0880	+0.2460**	+0.1430	—	—	+0.0110					
VAR010	MZ	-0.0789	-0.1436	+0.2678	+0.1414	-0.1181	-0.1572	-0.1232	-0.1137	+0.3275				
	DZ	+0.0767	+0.1648	+0.1328	+0.1785	+0.0807	-0.0862	+0.0178	-0.1526	+0.2563				
	MS	+0.0270	+0.0830	+0.0630	-0.0440	+0.0030	—	—	+0.0900	+0.1410				
VAR011	MZ	+0.0370	-0.2603	-0.2680	-0.1859	-0.0888	-0.0788	+0.0558	+0.1243	-0.2154	-0.2487			
	DZ	-0.1649	-0.1044	+0.1039	-0.1079	+0.1259	+0.1101	+0.0508	+0.1078	-0.1708	-0.1101			
	MS	+0.0080	-0.1120	-0.1430	-0.2280	+0.0191	—	—	+0.0170	+0.0530	+0.1130			
VAR012	MZ	-0.0201	-0.2088	-0.2780	-0.1445	-0.0913	-0.1565	+0.1560	-0.1239	-0.1880	-0.2402	+0.3260		
	DZ	+0.1180	-0.1383	-0.1436	-0.0091	-0.1676	+0.1169	+0.0778	+0.2206	-0.1818	-0.1451	+0.1800		
	MS	+0.0290	-0.2170	-0.2310	-0.1700	-0.1478	—	—	+0.0778	-0.0262	-0.1810	+0.2080		
VAR013	MZ	+0.0986	+0.1480	-0.1318	+0.1804	+0.1774	+0.1817	-0.1083	+0.2751	-0.0751	+0.0890	+0.1212	+0.0070	
	DZ	+0.1060	+0.0951	+0.0654	+0.2379	+0.2130	+0.2150	-0.1005	+0.3058	+0.1144	+0.2570	+0.2716	+0.1104	
	MS	+0.0460	+0.0440	+0.0840	+0.0830	+0.0031	+0.2381	—	+0.2451	+0.0290	+0.0630	+0.0390	—	
VAR014	MZ	-0.1430	-0.1788	-0.3131	-0.1334	-0.1132	-0.2387	+0.1501	-0.0816	-0.0066	-0.3091	+0.0003	+0.2448	-0.0827
	DZ	+0.1442	-0.1041	-0.0040	+0.1186	+0.0804	-0.0405	+0.1070	+0.0837	-0.1828	-0.2094	-0.1180	+0.1564	+0.0279
	MS	—	—	—	—	—	—	—	—	—	—	—	—	—

* SIGNIFICANT AT 5% LEVEL ** SIGNIFICANT AT 1% LEVEL *** SIGNIFICANT AT 0.1% LEVEL

the area of 0.5), but not to the various Positional Indexes, t-Index, and MLI.

BHI^t: Intetriradial distance ct, t-Index and PFI appear to be highly correlated with BHI^t, while other traits are not.

Intetriradial Distance ct: BHI^t, t-Index and most of the perpendiculars appear to be highly correlated with ct.

t-Index: Except for BHI^t and ct, other traits show only a low correlation with t-Index.

Positional Indexes: The five Positional Indexes, indicative of anatomical localization of the respective triradii transversally, invariably show low correlations with other traits.

MLI: Almost all metric traits show low correlations with MLI.

In conclusion, the results of this twin study practically confirm those of the singleton study. With the exception of the four perpendiculars, most of the fourteen traits studied appear to be independent from each other and they all seem to indicate a high degree of independence from the shape of the palm as expressed by PFI.

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