



DIRK R. SPENNEMANN

REGIONAL TRENDS IN HANDEDNESS AS A RESULT OF ENVIRONMENTAL AND EDUCATIONAL PRESSURES — THE EVIDENCE OF DRAWN FACES

ABSTRACT. — *The analysis of the orientation of two series of drawn human profiles revealed a strong differentiation within the Northern and the Southern German sample. The drawings are determined by the individuals and by educational pressures. The observed results allow to use the orientation of ancient rock art as indicators of prehistoric handedness.*

KEY WORDS: *Handedness — Writing habits — Environmental pressures — Education.*

Research on human handedness covers a wide range of interrelated problems which have been the focus of an enormous amount of research (Porac, Coren 1981, Bryden 1982).

Whether human handedness is fixed genetically or not and up to what extent it may be, how far the former assumption is correct, these issues shall be of no primary concern in this short communication.

It is a well known fact, that educational influences originating from the social environment have effect on the manifestation of the handedness of a born infant (Dawson 1972, Bryden 1982, p. 195). These environmental influences and pressures towards conformity within a social group are the regulating mechanisms of handedness representation (Hertz 1960).

Differences of handedness partitions can be observed between culturally comparable ethnic groups (Spennemann 1983, 1984). These regional differences are thought to be the result of different social pressures being active in those groups.

During a research project on the representation and partition of lefthandedness among prehistoric populations (Spennemann 1984, 1985) different

kinds of exploitable data sources being offered by our cultural heritage were scrutinized and analysed.

For analysing and exploiting the tremendous wealth of the palaeolithic rock art data a series of tests was conducted on the orientation of drawn human faces and the hands employed in these drawing processes. The test was designed to analyze the phenomenon that most righthanded individuals draw a human face towards the left. The validity of this phenomenon was to be checked as it might prove to be useful for handedness discriminations basing on rock art.

Two series of pupils drawn from public high schools (the high schools in Germany are called "Gymnasium") served as subjects in this analysis. One series was drawn from a mainly rural area in Northern Germany ($n = 291$), the other from an industrial and urban area in Southern Germany (the Rhein-Main-Area, $n = 170$). The towns the samples were drawn from are Enscheden and Fürstenaue (both Osnabrück county in Northern Germany) and Frankfurt in the Rhein-Main-Area. The subjects were given a sheet of paper and a pencil. They were asked to draw a human profile instantaneously and not to look around to anybody. The mean age of

TABLE 1. The orientation of righthanded drawn human faces according to subjects sex

Region	Males			Females			Total		
	n	Faces oriented to		n	Faces oriented to		n	Faces oriented to	
		left	right		left	right		left	right
Rhein-Main	84	88.10	11.90	76	85.53	14.47	160	86.66	13.12
North. Germany	127	67.72	32.28	148	65.54	34.46	275	66.55	33.45

TABLE 2. Positioning of the drawings on a sheet of paper.
Quadrants: TL = Top Left; TR = Top Right; BL = Bottom Left; BR = Bottom Right

	Rhein-Main-Area			Northern Germany		
	Males	Females	Total	Males	Females	Total
n	53	52	105	153	142	295
TL	50.94	51.92	51.28	66.90	75.16	71.19
TR	45.28	44.23	44.76	19.01	17.65	18.30
BL	1.89	1.92	1.90	10.56	3.27	6.78
BR	1.89	1.92	1.90	3.32	3.92	3.73

the Northern Germany sample was 13.09 years ($SD = 2.59$) and of the Rhein-Main sample 15.03 years ($SD = 1.77$). Of all pupils, regardless to sex, 5.50% and 5.88% respectively drew the faces with their left hands. This partition of lefthanders is little less than the overall percentage of lefthanders in contemporary Germany (Dennis 1958, Hovsepian, Slaymaker, Johnson 1980).

When analysing the right handed drawn faces, a quite astonishing difference between the two series could be observed (table 1).

Only 13% of all drawn faces looked towards the right in the Rhein-Main-Area sample, but as much as 33% in the Northern Germany series. The difference between these two percentages is well beyond expectation on the 1% confidence level.

It is suggested that this difference might be due to different educational or environmental pressures.

For checking this assumption the positioning of the drawing on the supplied sheet of paper is of some importance, as it reveals the impact of hand-writing habits (Dennis 1958, Hovsepian, Slaymaker, Johnson 1980). The positions of the drawings both in the Northern Germany and the Rhein-Main sample are given in Table 2.

Within the Northern Germany sample a total of 71.19% of all drawings was placed in the upper left quadrant, but only 50.94% in the Rhein-Main-Area. This difference is beyond expectation on the 1% confidence level. The same applies to the male and female series as well. This confirms that the pressure issued by the social environment has had its effects. This pressure is lasting more heavily on individuals living in agricultural (Dawson 1972) and rural societies than among individuals living in modern industrial areas.

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Dirk R. Spennemann
Johann Wolfgang Goethe Universität
Seminar für Vor- und Frühgeschichte
Arndtstrasse 11
6000 Frankfurt am Main
Federal Republic of Germany