



An Italian Army Twin Register

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Since military service in Italy is obligatory for all 20-year olds (“conscripts”) who do not choose to perform alternative civilian service, we thought of utilizing the data derived from the examinations all conscripts undergo, and selecting information relative to twins. The material we have gathered from the country’s Draft Boards concerns the period from October 1987 to December 1988, and this information allows to determine: 1) the twin status of a conscript and the identification of his cotwin; 2) aptitude for military service; 3) occupation; 4) presence of twins in the father’s or mother’s lineage; 5) home address and telephone number.

The twin material collected concerns 2,739 male pairs and 1,433 pairs of both sexes, classified with respect to:

- 1) Aptitude for military service;
- 2) Choice of occupation;
- 3) Presence of twins in the family.

1. APTITUDE FOR MILITARY SERVICE

In Italy, the modalities with which judgment is formed on aptitude are: 1) Apt; 2) Deferred to the following year; 3) Under observation at the military hospital; 4) Not apt. We considered the 2,739 pairs and calculated the frequency distribution of the combinations two by two of the modalities in the hypothesis of independence of the judgment of aptitude based on the frequency of the modalities in individual twins. This theoretical distribution was compared with the observed distribution and a very high level of concordance was found (Table 1). Upon exclusion of the modality of greatest frequency, both apt, the concordance value is more than double than expected (Table 2). This testifies to the existence of a twin pair factor that operates on the level of the parameters on which aptitude judgment is based. That factor is probably to be identified in the genetic covariance of the twin pair and in the influence of the common environment in which they live.

Table 1 - Twin concordance analysis with respect to aptitude to military service^a

Distribution of pairs					
2nd twin	1st twin				Total
	1	2	3	4	
1	1782	96	108	89	2075
2	109	69	10	11	199
3	82	10	59	3	154
4	87	16	10	62	175
Total	2060	191	187	165	2603

Analysis of concordance				
	Observed	Expected	χ^2_1	
No. of concordant pairs	1972	1680	50.75	
No. of discordant pairs	631	923	92.38	
Total no. of pairs	2603	2603	143.13	$p \ll 0.001$

^a 1 = Apt; 2 = Deferred; 3 = Under observation; 4 = Not apt.

Table 2 - Twin concordance analysis with respect to aptitude to military service^a excluding the pairs with at least one twin in the 1st class ("apt")

Distribution of pairs				
2nd twin	1st twin			Total
	2	3	4	
2	69	10	11	90
3	10	59	3	72
4	16	10	62	88
Total	95	79	76	250

Analysis of concordance				
	Observed	Expected	χ^2_1	
No. of concordant pairs	190	84	133.76	
No. of discordant pairs	60	166	67.68	
Total no. of pairs	250	250	201.44	$p \ll 0.001$

^a 2 = Deferred; 3 = Under observation; 4 = Not apt.

2. CHOICE OF OCCUPATION

Research on choice of occupation involves the psychological and sociological characteristics of twins when personal identity tends to assert itself on projects concerning the future.

The material and method of this analysis are the same as the previous one. The distribution by combination of occupation for all the male pairs was done using the classification "minimal" of the occupations set by the Central Statistical Institute (Table 3).

Table 3 - Distribution of twin pairs according to occupation^a

2nd twin	1st twin								Total
	1	2	3	4	5	6	7	8	
1	7	—	—	2	1	—	1	—	11
2	—	11	1	11	3	5	9	—	40
3	1	—	45	16	3	3	3	—	71
4	1	4	14	479	96	29	115	10	748
5	—	3	1	55	96	14	39	6	214
6	—	5	2	48	13	69	30	3	170
7	—	7	9	123	41	35	1175	19	1409
8	—	—	—	1	2	—	3	22	28
Total	9	30	72	735	256	155	1375	66	2691

Analysis of concordance

	Observed	Expected	χ^2_1	
No. of concordant pairs	1904	957	937	
No. of discordant pairs	787	1734	517	
Total no. of pairs	2691	2691	1454	$p \ll 0.001$

^a 1-8 = Classes of occupation in the ISTAT classification.

The pairs where at least one twin belongs to either of the categories "student" (7) or "unemployed" (8) were then omitted because of being transitory, hence of slight significance (Table 4).

Twin concordance analysis shows choice of occupation to be almost twice as concordant than expected in the hypothesis of independence. Therefore, it can be thought that the psychosocial orientation of the individual twin concerning his future is also influenced by genetic factors, as well as, of course, by the sociocultural environment in which he and his cotwin live.

Table 4 - Distribution of twin pairs according to occupation^a excluding the pairs with at least one twin in classes 7 (student) or 8 (awaiting occupation)

2nd twin	1st twin						Total
	1	2	3	4	5	6	
1	7	—	—	2	1	—	10
2	—	11	1	11	3	5	31
3	1	—	45	16	3	3	68
4	1	4	14	479	96	29	623
5	—	3	1	55	96	14	169
6	—	5	2	48	13	69	137
Total	9	23	63	611	212	120	1038

Analysis of concordance

	Observed	Expected	χ^2_1	
No. of concordant pairs	707	421	194	
No. of discordant pairs	331	617	132	
Total no. of pairs	1038	1038	326	$p \leq 0.001$

^a 1-6 = Classes of occupation in the ISTAT classification.

3. PRESENCE OF TWINS IN THE FAMILY

This research turns upon establishing whether a genetic causality exists in the conception of twins. The material on which we worked is that of the 2,739 male and the 1,433 opposite-sex pairs.

Analysis of the frequency of twinning in the family lineage of the father and mother of the index twin confirms twinning to be more frequent in the maternal than the paternal line (Table 5), as generally found in the literature and as the study of 3,377 twin pairs from the Mendel Institute twin register had also shown (presentation of Gedda and Brenci to the Lancisiana Academy of Rome).

CONCLUSIONS

Taken as whole, the results so far reached in the three projects we conducted on twins drafted between October 1987 and December 1988, seems to point to the following conclusions:

1) Existence of both genetic covariance and isoenvironment effects in the concordance with respect to aptitude to military service;

Table 5 - Distribution of twin pairs according to presence/absence of twinning in the paternal or maternal family

Family of mother	Family of father		Total
	Absence	Presence	
Absence	3165	407	3570
Presence	509	75	584
Total	3672	482	4154

Analysis of classes

Father's family	Mother's family	Observed	Expected	χ^2	
Absent	Present	509	458	5.24	
Present	Absent	407	458	5.24	
Total		916	916	10.48	$p \approx 0.001$

2) Existence of similar effects on the choice of occupation;

3) Higher frequency of twinning in the lineage of both father and mother, though particularly in that of the latter;

4) Importance of the time parameter on the genome's stability in people who lived for about twenty years in an environment which, however similar, surely had diversifying aspects. The chronogenetic contribution in both MZ and DZ twins proves their exceptional phenotypic concordance;

5) Possibility to use general population registers to create twin registers. To this end, it is sufficient to include data allowing to identify the twins and their cotwins. Wherever possible, information related to zygosity diagnosis by means of questionnaires should also be included.