

Birth Order of Psychiatric Patients

Hare and Price¹ stated that in studies of birth order, schizophrenics should be compared with a control group because of anticipated birth-rate biases attributable to change in birth rate and family size. But their control group was limited to psychiatric patients with diagnoses other than schizophrenia. Such a sample may be expected to differ from the normal population in various respects, including birth order.

Further analysis of this data¹ indicates that their control group of non-schizophrenic patients differed from the normal population in birth order distribution. Table 1 shows the number of patients in the first, second, intermediate, penultimate and last ordinal positions from families of five or more children. The expected numbers are calculated assuming that in each family size, cases are equally distributed among the ordinal positions. There is a marked over-representation of last born cases, compared with each other position, including the adjacent penultimate position. The pattern is closely similar and statistically highly reliable for both sexes. Schizophrenics of both sexes have a similar pattern of over-representation of the last birth position (Table 2) which supports previous conclusions²; with the smaller number of cases, the χ^2 values are short of statistical significance, with the exception of the comparison between the last born and penultimate cases for males.

Table 1 Observed and Expected Number of Non-schizophrenic Psychiatric Patients in Each Designated Birth Order from Families of Five to Nine Children

Birth order	Males			Females		
	Observed	Expected	Difference	Observed	Expected	Difference
First	386	411.7	-25.7	502	531.9	-29.9
Second	374	411.7	-37.7	482	531.9	-49.9
Intermediate	862	881.0	-19.0	1,077	1,161.2	-84.2
Penultimate	383	411.7	-28.7	529	531.9	-2.9
Last	523	411.7	111.3	699	531.9	167.1

All five birth orders $\chi^2=37.56$; $df=4$; $P<0.001$. $\chi^2=64.98$; $df=4$; $P<0.001$.

Penultimate compared with last birth order $\chi^2=21.33$; $df=1$; $P<0.001$. $\chi^2=23.26$; $df=1$; $P<0.001$.

Table 2 Observed and Expected Number of Schizophrenic Patients in Each Designated Birth Order from Families of Five to Nine Children

Birth order	Males			Females		
	Observed	Expected	Difference	Observed	Expected	Difference
First	40	40.8	-0.8	34	45.3	-11.3
Second	40	40.8	-0.8	46	45.3	0.7
Intermediate	77	85.3	-8.3	104	98.7	5.3
Penultimate	36	40.8	-4.8	41	45.3	-4.3
Last	56	40.8	15.2	55	45.3	9.7

All five birth orders $\chi^2=7.07$; $df=4$; $0.10 < P$. $\chi^2=5.60$; $df=4$; $0.10 < P$.

Penultimate compared with last birth order $\chi^2=3.93$; $df=1$; $P<0.05$. $\chi^2=1.76$; $df=1$; $0.10 < P$.

Hare and Price³⁻⁴ have clearly demonstrated that population changes can make the common assumption that births in the total population are equally distributed among all the ordinal positions inaccurate. For example, a trend towards smaller families in Great Britain has resulted in a decline in the number of large families. This tends to increase the proportion of people from the later birth orders of large families, because the higher birth rates in previous years than in subsequent years for such families result in a larger number of older than younger siblings. This does not, however, provide a satisfactory explanation for the birth order distributions of psychiatric patients from

families of five or more children (Table 1). The large difference between the number of penultimate and last born cases was not found for any other adjacent birth orders. The opposite trend occurred from the first to the second born. In contrast to these results, the birth order bias in the total population should apply in a constant, progressive fashion to each equally spaced ordinal position.

Other studies also indicate that the last born position can make the child more vulnerable to several different psychiatric illnesses. An illustration is the over-representation of last born cases, noted by Davis⁵ for a sample of homosexual males reported by Slater⁶. A similar effect, in several samples of male alcoholics⁷, has also been found in an unpublished study of 683 cases in the United States. The sample in Table 1 presumably included patients belonging to both of these categories; in particular some of the same homosexual patients⁶ were included, as they were from the same hospital during an overlapping span of years. These results for psychiatric patients contrast with other categories which contain an over-representation of first born cases. These include persons who have achieved intellectual distinction, including college students⁸, in particular those who subsequently develop hypertension⁹, as well as outstanding jet pilots¹⁰.

Research on birth order has been greatly aided by the fact that births in normal and stable circumstances can be expected to be equally distributed among the ordinal positions. Because of variations in birth rates at different times and places, biases based on birth rate changes can be minimized by using a population which includes a wide range of birth dates and localities, especially when pooling together data from different studies. In these conditions, persons who have gained distinction in various fields have shown highly consistent differences from the expected pattern of birth order distributions⁷. The proposed requirement of a control group for each sample¹ would severely retard research and might introduce greater errors than those remedied. An example is the specific over-representation of last born cases in their control group of non-schizophrenic psychiatric patients. Their data on schizophrenics (Table 2) agree with several earlier studies² to show that the later birth positions are over-represented in large families. They reached a contrary conclusion because of the erroneous assumption that the birth-order distribution of the non-schizophrenic control group, consisting entirely of psychiatric patients, resembled that of the total population.

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¹ Hare, E. H., and Price, J. S., *Nature*, **228**, 1223 (1970).

² Barry, III, H., and Barry, jun., H., *Nature*, **223**, 752 (1969).

³ Hare, E. H., and Price, J. S., *Brit. J. Psychiat.*, **115**, 647 (1969).

⁴ Hare, E. H., and Price, J. S., *Brit. J. Psychiat.*, **116**, 409 (1970).

⁵ Davis, D. R., *Lancet*, **i**, 540 (1962).

⁶ Slater, E., *Lancet*, **i**, 69 (1962).

⁷ Barry, jun., H., Barry, III, H., and Blane, H. T., *Quart. J. Studies Alcohol.*, **30**, 408 (1969).

⁸ Altus, W. D., *Science*, **151**, 44 (1966).

⁹ Paffenbarger, jun., R. S., Thorne, M. C., and Wing, A. L., *Amer. J. Epidemiol.*, **88**, 25 (1968).

¹⁰ Reinhardt, R. F., *Amer. J. Psychiat.*, **127**, 732 (1970).