Schizophrenic Birth Order: the Last but One Position

RESULTS of birth order studies on schizophrenics from the United States, Canada and Britain suggest an increased incidence of patients born late in the family[1–7].

A recent study, however, concludes that there is "an accumulation of evidence that the birth order distribution of schizophrenics varies with family size"—schizophrenics are born late in large families and early in small families[8]. Part of the evidence referred to is the sample of Solomon and Nuttall[9] which included a large number of small families of high social class and which showed an increased incidence of early born patients. This bimodal result was explained by separate class-dependent factors operating in the different sizes of family. It is the purpose of this communication to test a single-factor explanation.

It is possible that the schizophrenic patient tends to occupy a certain position in relation to the end of the family rather than in relation to the beginning (a reverse ordinal position), so that the penultimate sib, for example, is born late in large families, while in two-sib families it is the first born. The hypothesis is that there is over-representation of the penultimate reverse ordinal position in schizophrenic samples.

By collecting data from the literature, a very large sample can be amassed. Five studies in the literature report samples of schizophrenics (total $N = 3,482$) in such a way that distribution of the reverse ordinal positions can be calculated. The expected distribution is calculated by the Greenwood–Yule method[10]. Over-representation is calculated as the difference between the observed and expected distribution as a percentage of the expected distribution. Table 1 shows that there is no continuous increase in over-representation towards the end of the family. There is a peak of over-representation at the last but one position—this is true consistently for all five samples individually.

There are two samples of non-schizophrenic psychiatric patients reported in the literature which allow a similar analysis—498 manic-depressives[1] and 2,500 neurotics[11].

In this non-schizophrenic sample there is no over-representation of the last but one position. Table 3 shows the fit between the schizophrenic sample and the non-schizophrenic sample (family size distribution corrected to that of the schizophrenic sample). The disparity between the samples is clearly greatest at the last but one position.

Table 1. DISTRIBUTION OF REVERSE ORDINAL POSITIONS

Reverse ordinal position	Observed distribution	Expected distribution	Percentage over-representation $\left(\frac{\text{Observed}-\text{Expected}}{\text{Expected}} \times 100\right)$
Last	1,162·5	1,145	+1·5
Last but one	943	860	+9·7
Last but two	534·5	563	−5·1
Last but three	347	339	+2·4
Rest	495	575	
N	3,482		

$\chi^2 = 121{\cdot}05$ $d.f. = 4$
$P < 0{\cdot}001$

Table 1*a*. SAMPLES CONTRIBUTING TO TABLE 1

Study	N	Country	Reference
Malzberg, 1940	549	USA	1
Solomon and Nuttall, 1967	291	USA	9
Barry and Barry, 1967	1,019	USA	8
Gregory, 1959	431	Canada	6
Granville-Grossman, 1966	1,192	England	7

Table 2. DISTRIBUTION OF REVERSE ORDINAL POSITIONS OF NON-SCHIZOPHRENIC PATIENTS

Reverse ordinal position	Observed distribution	Expected distribution	Percentage over-representation
Last	1,004	927	+8·3
Last but one	663	685	−3·2
Last but two	480	474	+1·2
Last but three	319	328	−2·7
Rest	532	584	
N	2,998		

$\chi^2 = 12{\cdot}78$ $d.f. = 4$
$P < 0{\cdot}02$

Table 3. FIT BETWEEN THE SCHIZOPHRENIC AND NON-SCHIZOPHRENIC SAMPLES

Reverse ordinal position	Schizophrenic distribution	Non-schizophrenic distribution (corrected)	Percentage over-representation $\left(\frac{\text{Schiz.}-\text{Non-schiz.}}{\text{Non-schiz.}} \times 100\right)$
Last	1,162·5	1,229	−5·4
Last but one	944	833	+13·4
Last but two	534·5	573	−6·8
Last but three	347	332	+4·5
Rest	494	515	
N	3,482		

$\chi^2 = 22{\cdot}9$ $d.f. = 4$
$P < 0{\cdot}001$

This new analysis of already published data clearly indicates that the presence of one younger sib is associated with schizophrenia and can explain the anomalous results of Solomon and Nuttall without the introduction of social class factors.

One ordinal position is now identified with schizophrenia, so selection of these patients for further study will allow better understanding of what, if any, is the unique psychological position of the schizophrenic in the family.

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Evaluation of Teratogenicity of Lysergic Acid Diethylamide

THE concern about the psychological and physiological effects of lysergic acid diethylamide (LSD) has naturally led to the desire for experimental models to study the spectra of effects suspected to be caused by LSD. Among the recent reports of its biological effects when pregnant animal models are used, one involving rats is negative[1], another[2] is ambiguous because although stunted and still-births were reported with LSD at 10 days post partum the offspring were unusually large, weighing 44–46 g. Results with hamsters[3] are equivocal because of the small incidence of malformations reported, and those for mice are positive[4].

This report describes an attempt to demonstrate a teratogenic response to LSD using pregnant mice and hamsters. In addition, secondary Syrian hamster cultures were examined for growth alteration and for chromosomal aberrations in the presence of LSD. 'Delysid' (LSD-25) was obtained from the US National Institutes of Health as a solution containing 0·1 mg/ml. of LSD tartrate (Sandoz, lot No. 65002). Immediately before use, further dilutions were made with Dulbecco's salt solution which was also used for the control groups.

Syrian hamsters from the NIH breeding facilities, 9–11 weeks old and weighing approximately 100 g, were used. This species has responded to a wide variety of teratogens[5–7]. They were injected intraperitoneally during the time of greatest differentiation with a single dose of 10 μg (two animals), 100 μg (four animals), 200 μg (three animals) or 300 μg (four animals) on days 6, 7 or 8; in one case,