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Relationship between pregnancy order and birth order and length and weight of newborn infants.

J. ARTHUR HARRIS.*

[*From the Department of Botany, University of Minnesota, Minneapolis, Minnesota.*]

In a preceding paper[1] evidences for the existence of a low positive correlation between the age of the parents and the length and weight of the newborn infant of various nationalities have been adduced. The present paper is devoted to a consideration of the relationship between pregnancy order and birth order on the one hand, and the length and weight of the infant on the other. The source of the data is the same as that of those employed in the preceding investigation.

By pregnancy order I understand merely the serial order of the pregnancy (Gravida). By birth order I understand merely the order of birth of the child (Para). These differ by the number of miscarriages which may have occurred previous to the birth under consideration.

In Diagram 1 and 2 the heavy bars in each of the four panels denote zero correlation, as shown on the scale of ordinates.

Examination of the correlations for pregnancy order and the lengths of boy and girl infants shows that in 9 of the 12 available series the coefficients are positive, whereas in 3 of the series they are negative in sign. For the relationship between pregnancy order and weight of child, all of the coefficients are positive in sign. Thus for both weight and length, 21 of the 24 coefficients indicate a positive correlation between pregnancy order and the weight or length of the child.

The average values of the coefficients measuring the relationship between pregnancy order and the characteristics of the child are:

Pregnancy order and length of son,	$\overline{r} = +.0914$
Pregnancy order and length of daughter,	$\overline{r} = -.0117$
Pregnancy order and weight of son,	$\overline{r} = +.2102$
Pregnancy order and weight of daughter,	$\overline{r} = +.1393$

* These investigations were begun while the writer was a member of the staff of the Station for Experimental Evolution, and their completion has been facilitated by a research grant from the Carnegie Institution of Washington.

[1] Harris, J. A., PROC. SOC. EXP. BIOL. AND MED., 1926, xxiii, 801.

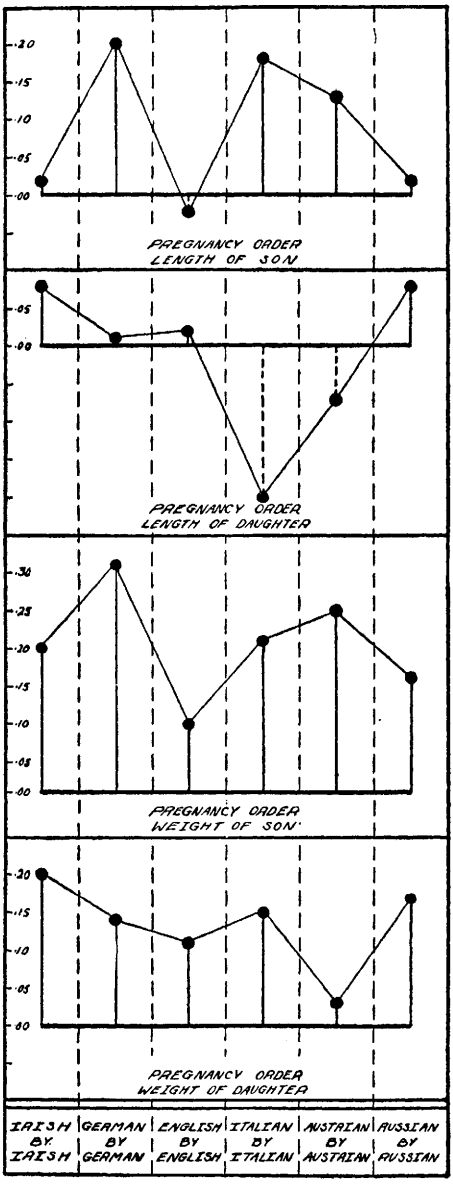

DIAGRAM 1.

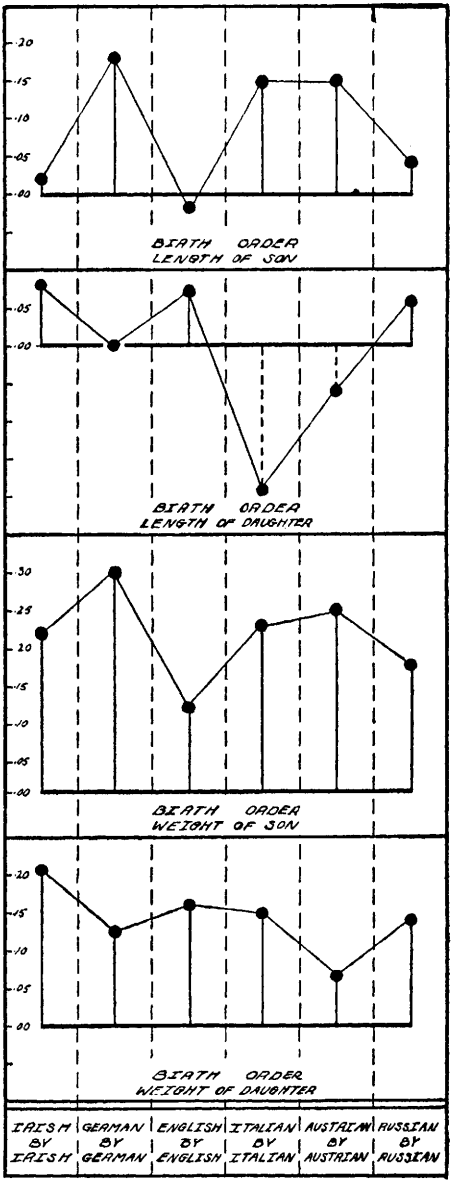

DIAGRAM 2.

The average of the coefficients for pregnancy order and length of girl infants is sensibly zero. The other averages are small, but sufficiently large to be considered probably significant.

Turning to the correlations showing the relationship between birth order and the length of the infant, we note a closely parallel condition. Of the 12 coefficients, 9 are positive as compared with 3 which are negative. In the case of the relationship between birth order and weight, the coefficients are without exception positive in sign and a number are of the order + .20 or larger.

In this series of coefficients there are certain outstanding exceptions to the prevailingly positive nature of the coefficients. These are seen especially in the case of Italian and Austrian girls. No explanation can be suggested for these cases.

The average values of the correlation coefficients are:

Birth order and length of son,	$\overline{r} = +.0900$
Birth order and length of daughter,	$\overline{r} = -.0054$
Birth order and weight of son,	$\overline{r} = +.2179$
Birth order and weight of daughter,	$\overline{r} = +.1434$

Again the average value for the girl infants is sensibly zero.

Considering these results in connection with those for the relationship between age and the characteristics of the infants as shown in the preceding paper, we may conclude that the evidence for some relationships between age of parents and pregnancy order and birth order, on the one hand, and the length and weight of the newborn infant, on the other, is unmistakable. We cannot, however, on the basis of the present data determine which of the four variables considered is the one which should be regarded as of primary importance in determining these interrelationships. This problem is being investigated on the basis of other series of data and in cooperation with embryologists and obstetricians.