



Contributions of the Danish Anthropological Survey to Child-Study

A. N. Gilbertson

To cite this article: A. N. Gilbertson (1913) Contributions of the Danish Anthropological Survey to Child-Study, The Pedagogical Seminary, 20:4, 542-548, DOI: [10.1080/08919402.1913.9944131](https://doi.org/10.1080/08919402.1913.9944131)

To link to this article: <http://dx.doi.org/10.1080/08919402.1913.9944131>



Published online: 13 Jul 2010.



Submit your article to this journal [↗](#)



Article views: 3



View related articles [↗](#)

CONTRIBUTIONS OF THE DANISH ANTHROPOLOGICAL SURVEY TO CHILD-STUDY

By A. N. GILBERTSON

In 1904 was appointed, under the auspices of the Danish government, an Anthropological Committee, for the purpose of conducting an anthropological survey of Denmark. The Committee has published a partial report of its researches, which are still being continued. The report, entitled "*Meddelelser om Danmarks Antropologi*" (Communications on the Anthropology of Denmark), consists of studies on the physical characteristics of the Danish population, including the height and weight of the body, the form and size of the head, the correlation between the height of the body and the dimensions of the head, the color of hair and eyes, etc.

Several of the studies are of special interest from the standpoint of child-study. Two of these, by Povl Heiberg and H. J. Hansen, are on the weight of new-born children; one, by Poul Hertz, is on the growth of children during school years, and two, by Søren Hansen and Harald Westergaard, deal with the question of the alleged inferiority of first-born children.

THE WEIGHT OF NEW-BORN CHILDREN

Heiberg makes a searching examination of the data on the subject already found in the literature. He finds that most earlier writers were too content with loose statements and further that they laid too much stress on extremes. Thus he, criticizes Vierordt, in the much-used "*Daten und Tabellen*" (1906) for bringing together data given by some thirty writers, without any critical analysis of the relative value of the data. For instance, Vierordt gives 252 observations of one investigator the same weight as over 3,000 of another.

The author emphasizes, and illustrates from earlier studies, the necessity of extreme care in securing and analysing data. "General averages are worthless, unless the components and their relative values are known," for instance, the sex of the children, the proportion of first-born, accuracy of the weighing, etc. The difference between the weights of boys and girls is so great, that fairly small changes in the relative numbers of the two sexes will affect the average. Further, it has earlier been shown that the weight of the first-born is less than that of the later children. The changes this difference may make in the general average can be understood from the fact that the average weight rises by no less than 75 gm. in each successive birth.

As an example of the importance of exactness in weighing the child the author gives the following: "In the case of 3,000 children the average weight measured to 50 gm. was 3,378.0 gm., but if the weight is taken no nearer than 150 gm. this average weight would be 3,376.5 gm. and with an exactness of only 250 gm. (about half a pound) on each weighing, the average would be only 3367.7 gm." He points out that "the tendency of observers to discard the lowest values and to prefer even numbers must also be taken into account."

Since the difference in the average weight of new-born children in two groups is necessarily of small dimensions, the material must be collected under very strict conditions. These conditions the author summarizes as follows: "In each of the two groups the number of records must be at 2-3000 (the average error would then be about 9 gm.). The sex of the children, also whether first-born, second-born, etc., must be known. Further, the exactness of the weighing should be stated, as also where and how the lower limit is determined. Other details should also be considered (*e.g.* the exact time when the weight has been taken in relation to birth and so on.)"

The data analysed by Heiberg consisted of records of over 3,000 new-born children from the provinces and from the maternity hospital in Copenhagen. H. J. Hansen's calculations are based on data concerning some 6,000 children. The latter data were collected during ten years of his country practice as district physician. He makes a comparison between these data and others from the maternity hospital in the capital. Heiberg also treats separately the records from the provinces and from the Copenhagen institution.

Both investigators find a significant difference in the average weights of the two groups of children, the weight of the new-born in the rural districts being greater than that of the hospital infants.

He finds that the weight increases with successive births. A like result is obtained by Heiberg. The latter, after allowing for this factor, concludes that there is no correlation between the age of mother and the weight of the child at birth. Hansen's calculations, on the other hand, disclose, after a process of elimination, an influence exerted by the mother's age on the increasing weight of the successive children. But this factor he considers as of minor importance. "The weight depends much more in general on the number of previous births than on the age of the mother."

This author takes up the relation between the weight of successive children and the age of the mother at her first pregnancy, to determine whether there is an optimum period for the beginning of child-bearing. He finds that the children of mothers beginning child-bearing between the ages of 30 and 34 inclusive have the greatest average weight, exceeding those of women who enter upon maternity at an earlier or a later age. Hence, according to Hansen, "the age-group 30-34 years seems to be the optimum period for the beginning of child-bearing, judged by the standard of the weight of the later children."

A correlation between the economic condition of the mother and the weight of the new-born child is revealed in the figures from the country districts, the more favored the position of the mother is in this respect the greater is the weight of the children. But a comparison of the results from the poorest classes in the rural communities with those from the maternity hospital in Copenhagen shows a considerable difference in favor of the former.

The author then goes on to determine whether this difference may not be due to the preponderance of illegitimate children in the Copenhagen records (about 80 per cent). First he compares the weight of the legitimate and illegitimate children in his own records from the country, taking account, by successive eliminations, of three factors which might enter into the result, namely, age of mother, number of children, and economic condition. The result shows that the illegitimate children are smaller than the legitimate. Then comparing the results from the illegitimate children from the country with the material from the maternity hospital, the author finds that the country children of this group weigh more than the hospital children. This

in spite of the fact that the mothers of the latter average two or three years older. "Thus," he concludes, "it is not merely the illegitimacy which reduces the weight of the children, but much more the poverty." For while the unmarried mothers in the country are as a rule poor, this is even to a greater degree true of this class in Copenhagen. Then too life in the country is on the whole more healthful than in the metropolis, a circumstance which may be presumed to have an important influence on the weight of the children.

Reference is made to the well-known folk-belief that so-called "children of love" are especially vigorous. But our Danish authority points out that if this circumstance should be investigated, the distinction should be made, not between legitimate and illegitimate children, but between those *conceived* before and those conceived in marriage. "To have this matter investigated would be of interest, but it would necessitate an extensive study of church records," he concludes.

Another point considered by Hansen is whether there is any correlation between the weight of the new-born children and the month or season of the year. He finds that the average weight is greatest in the autumn, and decreases through the winter until spring, when it reaches its minimum; then it rises through the summer, when it is about the same as in winter. This corresponds inversely to the curve for the death- and sick-rate in Denmark, which is at its maximum in March and its minimum in September and October.

Lastly, the author considers the bearing of these data on the problem of the numerical relation of the sexes. His figures indicate that the younger the mothers are at the beginning of child-bearing, the greater is the proportion of boys. No data were collected on the age of the fathers. But from other sources, it is learned that the younger the woman is at marriage, the older is the father compared with her age. Thus women under 20 marry on the average men 25.6 years of age; and at the other end of the series of diminishing differences, women 45 to 50 years old marry men of an average age of 47.4 years. This conclusion is in harmony with the Hofacker-Sadler theory that where the mother is younger than the father, more boys are born of the union, and vice versa.

THE GROWTH OF CHILDREN OF SCHOOL AGE

Hertz, the author of the study on this subject, formerly docent in school hygiene in the University of Copenhagen, observes, "At no other age does the good or evil of the surrounding conditions make such a marked impression on the bodily structure as just in the years of childhood and growth. The development of children should be carefully followed by means of accurate measurements." In doing so a distinction should be made not only between boys and girls, town and country, different sections of the land, but also between different classes of the community.

The Anthropological Committee has made a general and systematic study of the children attending the compulsory schools, in order to determine "whether the great efforts that have been made in the last generation towards improving the conditions of school life, have resulted in any appreciable progress with regard to the bodily development of the children."

Hertz deals with the measurements made on 2,365 children attending two schools in Copenhagen. These schools represent different classes of the community; the one is a paying school, the other a

free school. "With certain small reservations each may be taken as fairly representative of the class of children that would attend such schools in general. There can be no doubt that there is a considerable difference in hygienic and economic regards between the homes which send their children to the paying schools. The health is better in the latter, as also the clothing and general cleanliness. The interesting question was then to ascertain whether these conditions were reflected in the bodily measurements."

The tables for weight and height "give an unmistakable answer to the question." Comparing the children of each year between 6 and 13, Hertz finds that the children of the paying school (and this is true of both sexes), are throughout heavier and taller. The difference varies at different ages, being at a minimum at about the tenth year, for both height and weight. These phenomena the author explains on two principles, namely, "the influence of harmful conditions is most felt at the periods when development should be proceeding most rapidly, and there is a diminution in the growth-energy before puberty sets in."

A comparison is made between the children of the capital with those in some other parts of the country. It is found that the Copenhagen children have throughout the smaller measurements. This is especially significant in connection with Hansen's and Heiberg's figures for the relative weights of new-born children in the capital and the provinces, noted above. It may also be noted that S. H. A. Rambusch, in a study on the physical characteristics of school-children in some parishes in central Jutland (also published in this report), finds that the sons of farm-proprietors (*gaardmænd*) and of cottagers or crofters (*husmænd*) are at the same level in regard to height, while the daughters of the farmers are a little taller than those of the cottagers, a condition which he ascribes to the circumstance that the former are not exposed to so much work as the latter.

A further comparison is made between the present measurements and the results obtained 27 years previously. It would appear that while the boys have remained stationary, the girls have increased considerably in weight during that period.

Measurements of the chest show that the expansion increases year by year, the increase being greater for the boys than for the girls. The latter fact is referred to the lack of sufficient gymnastic exercise among the girls.

THE QUALITY OF FIRST-BORN CHILDREN

Sören Hansen, in his study of this question, points out that "in most civilized countries the great decline in fertility has in recent years given rise to the fear that the supposed weakness of the first-born children may lead to a lowering of the general standard of the race." He states that "to Karl Pearson belongs the honour of first displaying the eugenic importance of the question."

It is well known that many distinguished men were the youngest in the family. J. F. Cooper was the eleventh child, Holberg the twelfth, Schubert the fifteenth, Franklin the seventeenth, H. C. Andersen the twenty-first, etc. On the other hand Linnaeus, Goethe, Björnson and many others were the first born; Napoleón was the second child, Balzac the third, etc. "The general opinion that the later born possess more genius or talent must be relegated, on the available evidence, to the region of fairy tales of Cinderella and the youngest son who wins the princess."

The author has analyzed the statistics furnished by the reports of

an institution for feeble-minded in Copenhagen. His calculations show that the actual proportion of first-born among the feeble-minded is far in excess of that expected in a normal distribution. Pearson found a like condition among tuberculosis patients. ("A first study of the statistics of pulmonary tuberculosis," London, 1907). But Sören Hansen notes that "if this excess were due to some factor connected solely with the first birth or first conception, then the counterbalancing might be expected to begin already with the second-born, but this is not the case. The second and third children are more frequently represented among the feeble-minded than they should be, if the detrimental condition only affected the first born." Similar results from another asylum suggest that it is the earlier children and not merely the first child, which show the weakness. Weeks, in his study of epileptic patients ("The inheritance of epilepsy. Problems in eugenics," London, 1912), arrives at the same conclusion.

To test the matter more closely, Hansen examined a large material, 3,522 cases in all, dealing with patients suffering from pulmonary tuberculosis. Using the same method as in the case of the feeble-minded, *i.e.* comparing the actual number of patients with the number estimated from the general average, he finds that "not only the first-born but also the second and third are more frequently attacked by tuberculosis than they should be if their position in the family were of no importance, and this both for men and women." Pearson's investigation on the same subject, mentioned above, gave a similar result, but the material in the Danish investigation is so much more extensive.

The author concludes that "with regard to the general question, the inferiority of the first-born, more extended investigations are necessary before drawing definite conclusions, and it is desirable to know how far this possible inferiority may be counterbalanced by the many other factors which determine the racial quality. Increasing care of the children tends to diminish the dangers which have threatened the first-born more than the later and it is just this care which keeps down the mortality in families with few children. On the other hand, there is a good deal of collateral evidence for this relative inferiority. The frequency of abortion at the beginning of child-bearing, the greater number of still-born, the smaller weight on an average at birth, indicating under-nourishment, and the greater mortality during infancy point to some initial, constitutional weakness among the first-born. Nevertheless, the initial difficulties over, there is little difference in the death-rate after the fifth year between the first-born and the later children. Hence there would seem to be no reason for the inferior quality of the first-born among adults, as indicated by the greater frequency of tuberculosis, unless it be that the infection is obtained just in the early years, when the powers of resistance are not yet developed to the standard of the later children, and remains latent until a later period." This leads to the difficult question of inheritance. The author is inclined to believe that too much weight has been given this factor. A comparison of patients from consumptive and non-consumptive families shows no difference between the two so far as the relatively greater frequency of the first-born is concerned. In the words of the author, "The inferior quality of the first-born is thus a mystery and a question by itself, which is of such great importance that it deserves close attention and critical study."

Sören Hansen's study is followed by a paper by Westergaard, which is an excellent example of the use of "statistics in the service of anthropology," to quote part of its title. It is based chiefly on the

data of the previous paper. The author points out that practically all statistics used in anthropological investigation are "representative" statistics, *i.e.*, a group of observations are made which can be regarded as fairly typical and from them it is sought to discover a series of casual relations, which are then applied to related groups. Emphasis is laid on the necessity of carefully analyzing material which is taken as representative. For instance, "we may collect observations on the number of women addicted to drink in homes for inebriates. If the number is large, we may obtain interesting information regarding the characters of these and the conditions under which they lived. But we can hardly draw conclusions with regard to the whole population, nor as to the inception and relative frequency of drunkenness at different ages and so on."

With reference to the particular question at issue, Westergaard declares that even though we assume that the feeble-minded on which observations were made were representative of their class, we do not know what the relation is to the population as a whole. For we encounter the double difficulty that we have no adequate statistics on the proportion of first-born, second, etc., in the population, and even if we do gather such statistics now, we cannot take those as typical of conditions years ago, for statistics show that the birth rate is surprisingly variable from year to year. The feeble-minded which have been studied are as a rule beyond the years of early childhood, so we cannot be satisfied with figures on new-born children. It is the survivors, and not the new-born, with whom we are concerned. Census material for a certain district in Denmark shows the number of living and dead children in families, so that the proportion among the survivors of first-born, etc., can be approximately calculated. A comparison with the data for the feeble-minded indicates that the first-born have no greater tendency to feeble-mindedness than other children.

Another consideration which should be taken into account is the number of children in the families from which the feeble-minded come. This would indicate why so many first-born feeble-minded are found in proportion to all the first-born in the population. All families with one child, who is not feeble-minded, are not included in the observations at all. If one counted the families with one child reported in the returns, and asked how many of these had a feeble-minded child, the answer of course, would be 100 per cent. Hence the preponderance of the first-born among the feeble-minded in the data. "The preponderance is only formal, not real." To quote the author, "This peculiarity in the material shows the necessity of having particular information regarding both the serial position of the subject dealt with and the size of the family." In the Danish material (3522 patients) on consumptives 988 were first-born, but of these 178 belonged to one-child families. These must be excluded if one wishes to compare the relative frequency of the first and second child; similarly, the two-children families must be excluded in comparing the second with the third, etc. A comparison on this basis shows no marked differences. "If there is any correlation between the serial number and the disease, the later children are more exposed to the danger than the intermediate, the latter slightly less than the first-born, but the conclusion is not certain." A like criticism could be made on Pearson's study of pulmonary tuberculosis.

To secure certainty in judgments on the effects of the serial number of the birth, data should be gathered on a group of families, inquiry being made concerning the condition and relationship of each individual member. Westergaard points out that this was the method

used by Ansell in constructing his survival-tables. It may be added that a like method is employed and recommended by W. H. R. Rivers for the study of phenomena of relationship in *ethnological* research.

So on the question of the relative inferiority of the first-born child the answer on the basis of the data and criticism given by our Danish authorities must be the old verdict, "Not proven."

The Danish Anthropological Committee is to be congratulated on the important work which they are prosecuting. Not only their results, but even more their methods, are worthy of world-wide attention. Also the national government is to be complimented for initiating and supporting this survey. It presents a needed example for larger and wealthier nations. For years the Royal Anthropological Institute and other scientific bodies have appealed in vain to the British Government for the establishment of an anthropometric survey of the United Kingdom. In the United States such a national undertaking is presumably such a far-off event that as far as known no one has yet even asked for it. It is not the first time that the little kingdom of Denmark has led the advance in scientific research. European prehistoric archaeology, that great and rich branch of anthropology, dates, as a scientific study, from the establishment of a Danish royal commission in the early years of the nineteenth century. In the first decade of the twentieth century Denmark has taken the lead in establishing a national survey in physical anthropology.