

Winter 1934

Criminality and Delinquency in Twins

Aaron J. Rosanoff

Leva M. Handy

Isabel Avis Rosanoff

Follow this and additional works at: <https://scholarlycommons.law.northwestern.edu/jclc>

 Part of the [Criminal Law Commons](#), [Criminology Commons](#), and the [Criminology and Criminal Justice Commons](#)

Recommended Citation

Aaron J. Rosanoff, Leva M. Handy, Isabel Avis Rosanoff, Criminality and Delinquency in Twins, 24 Am. Inst. Crim. L. & Criminology 923 (1933-1934)

This Article is brought to you for free and open access by Northwestern University School of Law Scholarly Commons. It has been accepted for inclusion in Journal of Criminal Law and Criminology by an authorized editor of Northwestern University School of Law Scholarly Commons.

CRIMINALITY AND DELINQUENCY IN TWINS

AARON J. ROSANOFF, LEVA M. HANDY AND ISABEL AVIS ROSANOFF¹

About three years ago, we undertook to collect records of cases of mental disorders in twins. Our object was to accumulate for each important clinical group an amount of this kind of material that would make possible a statistical treatment. This work is now practically finished, and we have in our files the records of 1008 pairs of twins with one or both of each pair affected by one of the mental disorders selected for study.

We have also in our files the records of 313 pairs of normal twins which have been gathered for purposes of control.

We have included in our study cases of criminality in adults, juvenile delinquency, and behavior difficulties in children, and the present report will deal with this part of our material.

It has been pointed out many times in the past fifty years or more that studies of twins may throw light on the relative importance of hereditary and environmental factors in human achievement, in intelligence, in temperament, in behavior, in health and disease, and in connection with other human problems.

As our material grew in amount, and the more we scrutinized it, it appeared more and more definitely that this simple division of factors of human situations into those of heredity and environment is misleading, in that it tends to draw attention away from complexities which should receive detailed consideration.

In the literature pertaining to the causation of mental and behavior disorders, one finds reference to factors designated not only as hereditary, but also as inborn, congenital, pre-natal, constitutional, and the like. We believe that with the aid of our material and similar material to be found scattered in the literature, a more exact terminology and a more complete classification of causative factors can be devised.

While such material as ours cannot give us any idea of *the nature* of causative factors, it can indicate quite definitely *the developmental period in which such factors are operative*.

To be more specific, causative factors can be classified as follows:

¹Los Angeles, Cal.

pre-germinal, germinal, embryonic, foetal, natal, and as of various periods of post-natal development.

The factors which we would designate as pre-germinal are, perhaps, the only ones which may properly be spoken of as hereditary. They are the factors which are already operative in the ancestry of a given generation before that generation has entered upon the very beginnings of its existence in the form of primordial follicles in the ovary and of spermatocytes in the testis.

To establish the influence of a *pre-germinal* factor in the causation of a given mental disorder, it is not enough to show that it runs in families; that fact alone can often be accounted for by exposure of familial groups to the same conditions. But if, in addition to the familial occurrence of a given disorder, it may be shown that such disorder, if found in one of a pair of monozygotic twins, regularly affects the other as well; and if it may be shown further that if such disorder is found in one of a pair of dizygotic twins, the other twin is, as a rule, free from it; then we have an accumulation of evidence sufficient to establish a pre-germinal factor as the sole or principal factor in the causation of the disorder under consideration.

In those cases in which it is possible to establish a sex-linked mode of transmission in familial strains, that fact alone would place the causative factors in the pre-germinal period.

Germinal factors in the causation of mental disorders have received inadequate attention, and when referred to at all have often not been distinguished from pre-germinal factors.

The germinal period of development is a long and highly complicated one. There is evidence in the data of human histology that all the primordial follicles out of which ova are eventually to develop exist in the ovary of the female infant at birth, and, in fact, for several months before birth. It will be seen, then, that before an ovum has matured and become fertilized by a spermatozoon, it has been in existence for a period of from twelve to forty years—more or less—during which time it has gone through various phases of development. During this period it has been exposed to factors which have either fostered or hindered its development or which have, perhaps, had a disease-producing effect.

The germinal history of a spermatozoon, while quite different from that of an ovum, nevertheless also occupies a considerable period, during which it may be exposed to various factors for better or for worse.

There are some abnormal conditions which do not run in families

and are, therefore, not strictly hereditary, but which can, nevertheless, be shown to be caused by germinal factors. A striking instance in point is that of mongolism. Among monozygotic twins, if one is a mongol, the other is quite invariably also a mongol. Among dizygotic twins, it is quite regularly observed that if one is a mongol, the other is normal.

Mongolism hardly ever is found in more than one member of a familial strain. Moreover, mongols are sterile and short-lived, so that direct inheritance is practically out of the question.

There is reason for thinking that sclerotic and atrophic changes in the ovary can so injure an ovum during the germinal period as to cause mongolism.

The *embryonic* period of development extends from the time of fertilization of the ovum to the end of the eighth week of gestation. During that period, tissues and organs develop, and the architecture of the body is laid down. Factors which are operative in that period are apt to produce conditions which are associated with malformation or monstrosity. A condition of this kind, if found with relative frequency in only one of a pair of monozygotic twins, may be definitely attributed to an embryonic factor and not to an hereditary or germinal one; although it would be, nevertheless, inborn or congenital.

The *foetal* period begins at about the end of the eighth week of gestation and terminates at birth. It is a period mainly of growth in size and not so much one of tissue and organ formation as is the preceding period. It is also a period during which the functions of nutrition, respiration, and elimination are vicariously performed for the foetus by the mother through the medium of the placental circulation.

Disease-producing factors which are operative in the foetal period may be known by their tendency to bring about the same or similar conditions in both of a pair of dizygotic twins with a frequency greater than among pairs of siblings. This, then, constitutes a criterion for separating out another group of inborn or congenital or constitutional conditions, attributable, however, not to pre-germinal, germinal, or embryonic factors, but to factors operative in the foetal period of development. A striking instance in point is presented by a fairly large group of cases of feeble-mindedness.

We shall not enter here upon a discussion of disease-producing factors operative in the *natal* and various *post-natal* periods, as they are for the most part well known, although it is not always clearly

recognized that a so-called constitutional mental disorder may be produced by such factors, and that there is nothing whatever hereditary or even inborn in the causation of such disorders. Ontogeny is not completed at birth and arrests of development may occur at any time before maturity is attained.

With reference to the above-described classification of constitutional factors of mental disorders, it must further be noted that it is possible to distinguish three types of causation. These may be designated as simple, multiple or variable, and complex.

We use the expression *simple causation* in those cases in which the disease-producing action of a factor is limited strictly to only one of the developmental periods already enumerated. As an example of such a case might be mentioned Huntington's chorea, which is produced by a pre-germinal factor and nothing else. As another example may be mentioned mongolism, already referred to, as a condition caused solely by a germinal factor.

We speak of a *multiple or variable type of causation* in connection with conditions which may be produced now by a factor operating in one period of development and now by a factor operating in another. Perhaps the most outstanding example of such a group of conditions is that of feeble-mindedness. There is ample evidence, including some contained in our own material, that a great deal of feeble-mindedness is produced by an hereditary factor. There is, however, equally strong evidence that feeble-mindedness may be produced also by factors which are operative in any of the other developmental periods. A certain part of our material conclusively shows in particular that factors operative in the foetal period produce mental deficiency, as has already been stated; and it is very well known that a considerable percentage of cases of feeble-mindedness is caused by head injury at birth or later and by post-natal factors, such as meningitis or encephalitis occurring in infancy.

We speak of a *complex type of causation* in connection with those cases in which two or more factors operative in different developmental periods are required to produce the condition in question. This has been recognized in medical discussions of causation of mental disorders in which both predisposing and precipitating causes have been stressed.

Before proceeding with the presentation of our own material, we would make brief reference to similar material to be found in the literature. We would call special attention to a study by Johannes

Lange² published in Germany in 1928. This author reports an investigation of 30 pairs of criminal twins. He found that 13 of these were monozygotic twins and 17 dizygotic. Among the 13 pairs of monozygotic twins, both of each pair were criminal, and in a similar way, in 10 cases. In the remaining 3 cases only one was criminal in each pair, the other being without such tendencies. This presents a striking contrast with his dizygotic twins, among whom in only 2 cases were both twins of each pair affected. In 15 cases only one of each pair was affected and the other was free from such tendencies.

A few months ago, a study of psychoses and criminality in twins was published by A. M. Legras³ in Holland. In his material were included 9 pairs of criminal twins. Of these 4 pairs were monozygotic and 5 dizygotic. In all the 4 cases of monozygotic twins, both twins were affected; whereas in each of the 5 pairs of dizygotic twins, only one twin was affected. Both Lange and Legras conclude that there is an hereditary factor in the causation of criminality.

Our own material, in so far as it pertains to criminality and delinquency, consists of records of 340 pairs of twins, divided as follows:

Cases of adult criminality.....	97
Cases of juvenile delinquency.....	107.
Cases of behavior difficulties in children.....	136

We are not going to attempt a definition of criminality, juvenile delinquency or behavior difficulties in children beyond stating merely how we selected our material.

Any person eighteen years of age or over, who has been convicted and sentenced by a criminal court to serve a term in a county jail or in a state or federal prison or granted probation, is classified for our purposes as representing a case of criminality in an adult.

Any boy or girl, who has been brought to the attention of juvenile court authorities by reason of some offense and thereupon either placed on probation or committed to a correctional institution, is classified for our purposes as presenting a case of juvenile delinquency.

The cases of behavior difficulties in children were found in child guidance clinics, school clinics, children's clinics, neurological clinics, and in special classes for problem children in the public schools.

²Johannes Lange. *Crime and Destiny*. English translation by Charlotte Haldane. New York, 1930.

³A. M. Legras. *Psychose en Criminaliteit bij Tweelingen*. University of Utrecht, 1932.

These children, however, have not come in conflict with the law in such a way as to be brought to the attention of a juvenile court.

Our material indicates clearly that each of the three groups is a heterogeneous one; also that the three groups bear only a limited relationship to one another.

We submit a table in which this material is summarized.

Type and sex of twins	Clinical Group		
	Adult Criminality	Juvenile Delinquency	Behavior Problems in Children
Same sex twins, probably monozygotic			
Males, both affected.....	22	25	21
Males, one affected.....	11	2	4
Females, both affected.....	3	14	20
Females, one affected.....	1	1	2
Same-sex twins, probably dizygotic			
Males, both affected.....	3	11	13
Males, one affected.....	20	5	10
Females, both affected.....	2	9	13
Females, one affected.....	3	0	24
Opposite-sex twins, dizygotic			
Both affected.....	1	8	8
Only male affected.....	21	28	18
Only female affected.....	10	4	3
Totals	97	107	136

In this table our material is classified not only by clinical groups as representing adult criminality, juvenile delinquency, and behavior difficulties in children, but also by sex and by type of twins. In each case it is shown to what extent both twins of each pair are affected and to what extent only one.

Let us consider first the figures in the *adult criminality group*. We are dealing here with 97 pairs of twins, a total of 194 individuals. These are not equally divided as to sex. There are 144 men and only 50 women. 50 per cent of the women are free from criminality; whereas among the men the corresponding percentage is less than 29. In other words, our material brings out anew a fact that has long been well known in all countries, namely, that criminality is significantly more common in the male than in the female sex. No material is more convincing in this connection than that presented by opposite-sex twins.

The possibility of the existence of a sex-linked factor suggests itself, but it would require special research to throw light upon this question. Should the existence of such a factor be demonstrated, then that alone would point to a pre-germinal factor in causation.

It is to be noted that the contrast between the two sexes is less marked in the juvenile delinquency group and almost non-existent in the group of behavior difficulties in children.

We have in our adult criminality group 33 pairs of male twins which we have classified as probably monozygotic. In 22 of these cases both of the twins are criminal; and in 11 of these cases only one is criminal, the other not. This presents a contrast in comparison with the dizygotic male twins, of which there are 23 pairs in the adult criminality group. Here we find in only 3 cases both of the twins to be criminal; and in 20 cases only one is criminal, the other not. A similar showing is revealed by the female monozygotic and dizygotic twins, of which there are smaller numbers in our collection.

It will be noted that our findings are, in the main, similar to those of Lange and Legras. They point to the existence of either pre-germinal or germinal causative factors in adult criminality.

Inasmuch as family studies like those of Goring⁴ in England and S. S. and E. T. Glueck⁵ in this country have revealed a relatively frequent incidence of criminal tendency in certain familial strains, the evidence would seem to be complete that the causative factors in question are pre-germinal rather than germinal.

By this we do not mean to say that other factors are excluded from consideration. On the contrary, there is evidence even on the face of these figures that we are dealing here with a case of a type of causation which is both variable and complex; and further evidence to that effect will be revealed when our material is published in detail.

For obvious reasons, we are especially interested in cases of monozygotic twins in which only one of the pair is affected. We have not yet completed a detailed analysis of our material, but we are able to say at this time that it seems necessary to draw a distinction between *criminalism* and *criminality*. The latter term is very broad and includes cases presenting an incidental maladjustment. For the term *criminalism* we would propose a more restricted meaning in the sense of a strong and persistent constitutional tendency which manifests itself under various conditions of no special difficulty or strain.

Incidental criminality, as thus distinguished from criminalism, is more often found to affect only one of a pair of monozygotic twins.

For illustration in this connection we can cite the case of the P. twins, A. and C., who were investigated by us in November, 1932, when they were nearly 32 years old. We found A. in the Los Angeles

⁴C. Goring. *The English Convict*. London, 1913.

⁵S. S. and E. T. Glueck. *Five Hundred Criminal Careers*. New York, 1930.

County Jail serving a brief term for vagrancy. There is no record of previous arrests, but rather a history of satisfactory adjustment in work on a ranch, later nine years' service in the army with honorable discharge. He was an automobile mechanic, but unemployed. His brother C. never left the ranch on which they had been employed together for seven years and was still working there at the time of the investigation. He had never been arrested.

Although, in the course of our work, we made no attempt to gather data pertaining to the biology of twinning, we have been led by facts which forced themselves on our attention to discard the expression *identical twins*. Monozygotic twins are as a rule more nearly alike than any two persons that may be otherwise selected; but they are never identical; and sometimes they present physical, intellectual, and temperamental contrasts which may be said without exaggeration to make all the difference in the world.

The cause of the division of a product of conception in the early part of the embryonic period into two or more individuals is not known; there are some indications that the manner of the division may not be the same in all cases, and perhaps not even in the same plane; it will be recalled that in about one-fourth of the cases of monozygotic twins one of the twins is right-handed and the other left-handed; also apparently there may be quantitative inequalities in the original division. However that may be, factors often come into play in the embryonic, foetal, and natal periods to give rise to inequalities which are found to exist at birth and later in more or less marked degree. Such inequalities are the rule rather than an exception among monozygotic twins.

Such inequalities of original endowment or of development may account for some of the cases of monozygotic twins in which one is criminal and the other not.

We would cite one of our own cases in this connection, namely, that of the C. twins, W. and D. They were investigated by us in the period from October to December, 1932, when they were 25 years old. Father is a practicing physician, states there was only one placenta; in features, color of eyes, hair, and skin they were so much alike that they were constantly confused even by people who knew them well. D. was the first-born and was the heavier by one pound at birth; however, he took the childhood diseases much harder than W. and is not quite so robust as W. now. Mother states that from the beginning they were the exact opposites in disposition, D. was always quiet and studious, liked to stay at home and read, whereas

W. wanted gay parties and excitement. They have always had different friends; while there was no special antagonism between them, they were not specially attached to each other. D. "takes the cares of the world on his shoulders," while W. "never has a care in the world." D. has never shown criminal tendencies and has never been in conflict with the authorities, whereas W. has associated with questionable characters, has gambled, used mariahuana and alcoholic beverages. In April, 1930, he was arrested and charged with grand theft. He had stolen an automobile, substituted false license plates—which he had also stolen—obtained gasoline by leaving a spare tire for security, forged his father's name to a check for \$10; later abandoned the car in another town. He entered a plea of guilty on all counts. He was first in the town lock-up for a day or so, then in the county jail for three months, then in road camp seven months, and is now on probation for five years.

It would appear from evidence presented by a part of our material that a head injury may produce such a change in a person's temperament or character as to establish a persistent criminal tendency which previously was not noted. Some corroboration of such a mechanism is to be found in one of Lange's cases. We do not believe that a head injury of any kind or degree can by itself produce a criminal tendency; but it seems to us not improbable, in spite of the meagerness of material pertinent to this question, that a head injury, like alcoholism or diffuse syphilitic disease of the cerebral cortex, may injure controlling and inhibiting mechanisms and thus release an anti-social tendency in individuals in whom such a tendency has previously existed as an inherited or inborn but latent trait.

A case in point is that of the M. twins, Gl. and Ge., born in 1897, both of whom made an outstanding record in their schooling and subsequent career up to the age of 21. Ge. has since then continued to be a gentleman of fine standing in the community, eminently successful in his work. Gl., whom we found in a penal institution, after gaining no fewer than seven citations for his services as an aviator in the World War, suffered two head injuries in airplane crashes in June and in September, 1918. Upon recovery from the immediate effects of these injuries, he drifted into a criminal career, and we have a record of twelve convictions between 1920 and 1932, with jail and prison sentences in two states, the offenses consisting of receiving stolen property, passing bad checks, breaking and entering, forgery, battery, and the like.

We must point out that in this particular clinical group it is more

difficult than in any of the others to be sure of our data. Not only the prisoners themselves, but also their relatives and friends are often in a conspiracy to withhold information that might be incriminating. Perhaps the percentage of cases of monozygotic twins in the adult criminality group in which only one of the twins is affected and the other free from criminal tendency would be less than appears in our figures if more reliable information could be obtained.

Finally should be mentioned possible error in the classification of the twins resulting from mistaking dizygotic for monozygotic twins (or *vice-versa*).

To recapitulate, then, our material indicates that in two-thirds of the cases of adult criminality in monozygotic twins, when one is criminal the other is likewise criminal. In the remaining one-third of the cases, only one of each pair of twins is criminal. Our material suggests five possible explanations as perhaps accounting for the apparent inconsistency: (a) Incidental criminality, as distinguished from criminalism, being determined mainly by environmental rather than by constitutional factors, occurs under special conditions to which only one twin of the pair is exposed. (b) Inequalities of the original division of the early embryo or inequalities of development during intra-uterine life may account for differences in constitutional make-up. (c) Some such factor as a head injury, alcoholism, or diffuse syphilitic disease of the cerebral cortex, existing only in one twin of the pair, may destroy controlling or inhibiting mechanisms and thus lay bare a previously latent anti-social component in his temperament. (d) Concealment of a criminal tendency in one of the twins by a conspiracy for that purpose among our informants may erroneously raise the percentage of cases in which only one twin is affected. (e) Mistaking a pair of dizygotic for monozygotic twins may also erroneously raise the percentage of cases in which only one twin is affected.

Turning now to the *juvenile delinquency group*, we find it to be even more markedly the case that in monozygotic twins, whether male or female, when one of the pair is delinquent, the other also will be delinquent. This in itself is, of course, not conclusive of anything. It simply means that where we have similar heredity plus similar environment, then the behavior also may be expected to be similar. We have, however, one pair of monozygotic female twins who were reared apart. They are the J. twins, A. E. and M. J. Our investigation of them was made between December, 1930, and March, 1931, when they were twenty years of age. They were born in Minnesota, but

were separated at the age of 3 years. M. J. was brought up by her mother in California and A. E. by friends in Wyoming. M. J. had fewer advantages as compared with her sister, whose foster parents were very well-to-do. They corresponded only occasionally, and only once for a period of about four weeks they visited together in Wyoming. At about the age of sixteen, they both developed a tendency toward various sex delinquencies, and would often run away from their respective homes and get into difficulty. Finally, they were both committed to state correctional institutions for girls, the one to the Ventura School in California, in November, 1928, and the other to the Industrial Institute in Sheridan, Wyoming, in June, 1929. Unfortunately, we do not have many cases of monozygotic twins reared apart.

The striking finding in the juvenile delinquency group is among the dizygotic twins, as the table shows. We have 16 pairs of male dizygotic twins, and among these both are affected in 11 pairs and only one affected in 5 pairs. We have, moreover, 9 pairs of female dizygotic twins, and in that group both are affected *in all cases!*

We cannot on this occasion offer an adequate presentation of our material. Suffice it to say here that only a small part of the material included in our juvenile delinquency group seems to be fundamentally related to criminalism in adults, as we have already attempted to define it.

Delinquency in girls is mainly sex delinquency and is a matter which differs greatly in its nature and causes from the bulk of delinquency in boys.

For a large proportion of the cases of delinquency in both boys and girls, inborn factors are relatively insignificant as compared with post-natal factors, presumably those which might be generally designated as social environment.

The last point has obvious bearing not only on the question of causes, but also on matters of practical policy as to classification and treatment of juvenile delinquents.

Our group of cases of *behavior problems in children* is even more heterogeneous than the other two groups. Cases are contained in it which are fundamentally related to criminalism and delinquency; there are also cases which are more closely related to, or are the precursors of, psychotic and psychoneurotic conditions; and there are, finally, cases, perhaps representing more than half of the material, in which there is no fundamental abnormality, and in which we are

dealing with manifestations arising in the midst of a chaotic social environment.

In conclusion, we would like to state that we are now at work on our material, not only as it relates to criminality and delinquency, but also as it relates to mental deficiency, epilepsy, dementia praecox, manic-depressive psychoses, and other mental disorders. We hope to present our material very fully, as well as to present a more detailed discussion and interpretation of it.

We are left with the impression that biologic research affords a promise of bringing us nearer to application of scientific method in the field of psychiatry. Such research, however, should be organized on a much larger scale than heretofore and by the state rather than privately; for the state alone can provide such sanctions and authorizations as would be needed for gathering the necessary data routinely in special groups of subjects and in the unselected population.