

2004 Pre-Publication Draft of Chapter 8 of *The Gene Illusion*

"Is Crime in the Genes? A Critical Review of Twin and Adoption Studies of Criminal and Antisocial Behavior"

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In today's "everything is genetic" atmosphere, even traits usually thought of as being the product of environmental influences are subject to the claims of hereditarians. It should therefore come as no surprise that, increasingly, criminal behavior is seen as the result of defective genes.¹ In this chapter I focus on twin and adoption studies of "criminal," "antisocial," and "psychopathic" behavior as examples of how genetic research is used in the study of human behavioral differences.² Topics beyond the scope of this chapter include the "XYY" controversy of the 1960s and 1970s, and molecular genetic research. Suffice it to say that, apart from claims made about Brunner and colleagues' 1993 study of one Dutch family, no genes have been found to cause criminal or antisocial behavior.³

When people read about an alleged genetic link to crime, they are apt to conclude that "crime is genetic." This leads to a belief that criminality is the result of genetic makeup—and not of racism, poverty, and other oppressive social conditions—thereby influencing public attitudes toward ethnic groups having a relatively high conviction/incarceration rate.

As a prelude to a discussion of twin and adoption studies, it is worthwhile looking into the historical background of the “genetics of criminality” question. This is the subject of the following section.

Some Early Views of the Genetics of Criminality

Like other types of socially disapproved behavior, the inherited basis of criminality was widely accepted long before adoption, twin, or even family studies had been performed. In the 19th century, Italian physician Cesare Lombroso argued that criminals could be identified by their physical features and that they represented, to use Gould’s description in The Mismeasure of Man, “evolutionary throwbacks in our midst.”⁴ According to Lombroso,

Many of the characteristics presented by savage races are very often found among born criminals. Such, for example, are: the slight development of the pillar system; low cranial capacity; retreating forehead; highly developed frontal sinuses . . . the thickness of the bones of the skull; enormous development of the maxillaries and the zygomata . . . greater pigmentation of the skin; tufted and crispy hair; and large ears. To these we may add the lemurine appendix; anomalies of the ear; dental diastemata; great agility; relative insensitivity to pain; great visual acuteness; ability to recover quickly from wounds; blunted affection; precocity as to sensual pleasures . . . laziness; absence of remorse; impulsiveness; physiopsychic excitability; and especially improvidence, which sometimes appears as courage and again as recklessness changing to cowardice.⁵

For the eugenicist Charles Davenport, criminals represented “our . . . ape-like ancestors” from “animalistic strains,” who should be rooted out of the American breeding stock:

The acts of taking and keeping loose articles, of tearing away obstructions to get at something desired, of picking valuables out of holes and pockets, of assaulting a neighbor who has something desirable or who has caused pain or who is in the way, of deserting a family and other relatives, of promiscuous sexual relations—these are crimes for a twentieth century citizen but they are the normal acts of our remote, ape-like ancestors. . . . Imbecility and “criminalistic” tendency can be traced back to the darkness of remote generations in a way that forces us to conclude that these traits have come to us directly from our animal ancestry and have never been got rid of. . . . If we are to build up in America a society worthy of the species man then we must take such steps as will prevent the increase or even the perpetuation of animalistic strains.⁶

Today, the publicly stated views of Lombroso and Davenport are an embarrassment to genetic researchers, but the suggestion of criminals as “evolutionary throwbacks” remains in some quarters.

The role of genetic factors in crime was widely accepted during the late 19th and early 20th centuries.⁷ As an American physician wrote in 1914, “That a criminal father should beget a child pre-destined to criminality is a foregone conclusion. The father exerts a hereditary influence equal to all the previous ancestors in the paternal line.”⁸ A physician at Sing Sing prison in New York held this opinion:

My own observations, which have been practically unlimited along lines of information connected with the male offender, have led me to believe, in the last few years, that criminal character depends in the first instance on heredity. . . . So the born criminal is the product, mind and body, of the forces of heredity. Not only his body, but his mind is deeply impressed with the character of the parentage. And few indeed are the criminals who come to our prison at Sing Sing with minds that were at birth tabula rasa, whose mental powers at birth were not already thickly sown with seeds of crime.⁹

There were frequent calls for the sterilization of criminals on eugenic grounds during this period. Vasectomy was proposed in the late nineteenth century by A. J. Ochsner as a “humane” alternative to castration.¹⁰ Ochsner justified this procedure on the grounds that it was “demonstrated beyond a doubt that that a very large proportion of all criminals, degenerates and perverts have come from parents similarly afflicted.”¹¹ He believed that a large-scale sterilization of criminals “would do away with hereditary criminals from the father’s side,” and recommended the same treatment for “chronic inebriates, imbeciles, perverts and paupers.”¹²

In 1907, Indiana became the first of many U.S. states to pass a law permitting compulsory eugenic sterilization. The law sanctioned sterilization “to prevent procreation of confirmed criminals, idiots, imbeciles, and rapists” residing in a state institution, and who had been judged as “unimprovable” by a panel of physicians.¹³ A prison physician, Harry Sharp, had

performed vasectomies on inmates in Indiana since 1899. According to Sharp, “There is no disputing the fact that mental as well as physical defects are transmitted to the offspring. . . . The decidedly defective individual is very easily recognized, as the mental abnormality is usually accompanied with prominent physical defects, described by Lombroso.”¹⁴ In a 1909 discussion of Sharp’s article in the pages of the Journal of the American Medical Association, Dr. J. N.

Hurty, who had recently visited the estate of a wealthy family, added the following comments:

I was standing near the man who was in charge of the beautiful collies at the kennels; one of them (a female) came up to me, and she looked so pleasant that she seemed to me to have a laugh on her face. I patted her on the head, and she was duly grateful for the attention. I asked him, “Do you have any vicious dogs here?” He said, “Do you suppose that we would breed from viscous animals? If a vicious animal appears here we kill it; we have nothing to do with them at all; and the result is that we have no biting animals, but only those amenable to instruction.” Why cannot we apply this to the human family? [emphasis added].¹⁵

While the call to kill (and thereby, as imagined, eliminate) “vicious” strains in the “human family” was an extreme view even for that time, a glance at the bibliography of a 1938 review of the period’s literature on the causes of crime demonstrates the common concern over the procreation of “criminals” and “defectives.”¹⁶ The consensus was that society could greatly reduce criminality and antisocial behavior by preventing the reproduction of people manifesting these behaviors.

The period 1877-1919 saw the publication of several histories of American “degenerate families,”¹⁷ the most well-known being Richard Dugdale’s The Jukes, and Henry Goddard’s The Kallikak Family. For many years these “studies” were cited as proof that criminality and “feeble-mindedness” were hereditary conditions. For Lombroso, Dugdale’s book provided “the most striking proof of the heredity of crime.”¹⁸ According to Davenport, Dugdale showed that criminal family pedigrees could be the result of “a single focal point” of bad heredity, which in this case was “traced back to Max [Juke] living in a lonely mountain valley.”¹⁹ Davenport

created pedigrees of his own and concluded, “The foregoing cases are samples of scores that have been collected and serve as fair representations of the kind of blood that goes into the making of thousands of criminals in this country.”²⁰

Today, the Jukes and Kallikaks “studies” are largely discredited because, among other reasons, it is widely recognized that poverty, criminality, and illiteracy can run in families for social and environmental reasons. That being said, I should point out that Dugdale and Goddard recognized the importance of environmental conditions. According to Dugdale :

Where the organization is structurally modified, as in idiocy and insanity, or organically weak as in many diseases, the heredity is the preponderating factor in determining the career; but it is, even then, capable of marked modification for better or for worse by the character of the environment. . . . Where the conduct depends on the knowledge of moral obligation (excluding idiocy and insanity), the environment has more influence than the heredity. . . . For instance, where hereditary kleptomania exists, if the environment should be such as to become an exciting cause, the individual will be an incorrigible thief; but if, on the contrary, he be protected from temptation, that individual may lead an honest life, with some chances in favor of the entailment stopping there.²¹

And Goddard wrote that “there is every reason to conclude that criminals are made and not born,” while adding that the “best material out of which to make criminals, and perhaps the material from which they are most frequently made, is feeble-mindedness.”²²

Few modern proponents of a hereditary basis for criminal behavior claim that there are “genes for crime.” Rather, they argue that people inherit predispositions for personalities that make them more likely to commit crime. According to Goldsmith and Gottesman,

Notions such as “genes for crime” are nonsense, but the following notion is reasonable: There may be partially genetically influenced predispositions for basic behavioral tendencies, such as impulsivity, that in certain experiential contexts make the probability of committing certain crimes higher than for individuals who possess lesser degrees of such behavioral tendencies.²³

Still, despite disclaimers of this type, the results of genetic research lead many to believe that criminal behavior is caused by faulty genes.

Defining Criminal and Antisocial Behavior

Any study of the genetics of criminal and antisocial behavior is confronted with the problem of how to define these concepts. Not surprisingly, political and moral considerations come into play. As eugenicist Paul Popenoe pointed out in an article written during the Great Depression, “A few years ago the man who had a bag of gold in his safe was a thrifty and praiseworthy citizen; today he is a criminal.”²⁴ Criminality, observed critics Hubbard and Wald, is a social construct that depends on context. “Killing,” they wrote, “can be heroism or murder,” and “taking someone’s property can be confiscation or theft.”²⁵ Even Lombroso would have likely applauded the deeds of his “criminal men,” had their “savagery” only been directed at the opponents of the Italian army’s colonial campaigns.

Another problem is that being a registered or convicted criminal is dependent on one’s being apprehended and charged. According to Rutter, “Many surveys have shown that, at some time, almost all boys commit acts that fall outside the law and which could have led to prosecution if they had been caught.”²⁶ Surveys in Scandinavian countries such as Norway, Sweden, and Denmark, where some of the most frequently cited twin and adoption studies were performed, show that most young men, when answering anonymously, admitted to committing one or more criminal offenses at some point.²⁷ If these surveys are representative of the population, one could conclude that most Scandinavian males are genetically predisposed to commit criminal acts! One might argue that genetic studies of registered or convicted criminality look for genetic factors in the apprehension for, rather than the commission of, criminal acts. According to sociologist Troy Duster, “if one looks at the record in 250 years of U.S. history, no white man ever committed the crime of rape on a black woman in twelve southern states.”²⁸

Another critic wrote that an illegal act one day can become legal the next, and that the reporting of certain types of crime varies widely. He also noted that wealthy people usually have better legal representation than the poor. His conclusion: “In using any sort of recorded crime figures, researchers are taking on something that is very messy indeed, and that is one reason why confusion will follow.”²⁹

In this chapter I analyze the most frequently cited twin and adoption studies of criminal and antisocial behavior. We have seen that family studies can at best demonstrate “scientifically” what society already knows—that the relatives of criminals are more likely to be criminals than are the relatives of non-criminals. According to adoption researchers Brennan, Mednick, and Gabrielli, “In terms of genetics, very little can be learned from . . . family data alone,” because “The parents have a major influence on the child’s environment as well as on his/her genetic makeup; family studies cannot disentangle these hereditary and environmental influences.”³⁰

Criminal Twins: Blood Brothers or Partners in Crime?

The Twin Method and the Study of Criminality

The German investigator Johannes Lange published the first criminal twin study in 1929, only a few years after the twin method had been developed. He identified 13 identical and 17 fraternal pairs where at least one twin had been imprisoned. Because Lange (who was often referred to as “Kraepelin’s favorite student”³¹) found that ten identicals but only two fraternal had a co-twin who was also imprisoned, he concluded that genetic factors “play a predominant part.”³²

In 1934, Rosanoff et al. published their study of 97 twin pairs, finding male concordance rates of 22/33 identical (67%) and 3/23 same-sex fraternal (13%). They concluded that criminal behavior is caused by “pre-germinal [genetic] rather than germinal” factors.³³

Two criminal twin studies were published in Nazi Germany in 1936. Friedrich Stumpfl, who produced the most influential criminal biology research during the Nazi era,³⁴ studied 18 identical and 19 fraternal pairs, finding concordance rates of 65% and 37% respectively.³⁵ While opposing the blanket sterilization of criminals, Stumpfl called for extending the sterilization law to include all “incorrigible recidivists.”³⁶ Kranz found concordance rates of 66% identical (21/32) and 54% same-sex fraternal (23/43). This comparison is not statistically significant, which did not prevent Kranz from calling for the sterilization of criminals in the interest of racial hygiene (see Chapter 2).

Following the publication of a handful of small studies between 1937 and 1976, two major Scandinavian criminal twin studies were published in the 1970s by Christiansen, and Dalgard and Kringlen. These investigations were based on national registers and studied an entire population of twins unselected for criminality.

Dalgard and Kringlen studied 49 male identical and 89 same-sex male fraternal pairs, finding no statistically significant concordance rate difference using either a “broad” or “strict” definition of crime. The identical twin pairwise rate for broadly defined crime was 22%, and 26% for strictly defined crime. On the basis of these results and of the more similar environments experienced by identical twins, the authors concluded, “These findings support the view that hereditary factors are of no significant importance in the etiology of common crime.”³⁷

Christiansen studied 85 identical and 147 same-sex fraternal pairs (and an additional 196 pairs of opposite-sex fraternal), reporting pairwise concordance rates of 33% identical (28/85)

and 12% same-sex fraternal (17/147).³⁸ Christiansen's sample included all twins born between 1881 and 1910 in the Danish islands east of the Little Belt in which both twins were alive past the age of 15. Their names then were checked against Danish police records. Christiansen's final results were published by Cloninger and Gottesman in 1987, who reported a pairwise identical rate of 48% (56/116), and a same-sex fraternal rate of 28% (56/202).³⁹

In 1995 Lyons and associates published a study of pairs obtained from the Vietnam Era Twin Registry (VETS). They performed diagnostic interviews by telephone, and concluded that several antisocial traits were "significantly heritable."⁴⁰ However, their self-report data was subject to bias. For example, most respondents in a companion study denied any "early criminal behavior" such as "swip[ing] things from stores or from other children or steal[ing] from your parents or from someone else."⁴¹ As a critic asked, "Who hasn't swiped something before the age of 15?"⁴² In fact, two-thirds of the respondents denied all antisocial behaviors. The very title of Lyons's 1996 investigation, "A Twin Study of Self-Reported Criminal Behavior," illustrates an important problem with studies of this type. Unless answering anonymously, people tend to refrain from telling other people (especially strangers) about their past and present criminal and antisocial behavior.

Other twin studies of antisocial behavior have been performed in the last 20 years, which I will not review here.⁴³ As should by now be clear, assessing the validity of the underlying assumptions if the twin method is the crucial question at hand.

Twins Reared Apart

Although there are several individual case studies of reared-apart criminal twins in the literature, there has been no systematic study of reared-apart criminal twins, apart from a 1990 study of antisocial behavior by William Grove and his MISTRA colleagues.⁴⁴ Although Grove et al. claimed to have found “significant heritability” for childhood and adult antisocial behavior, we saw in Chapter 4 that reared-apart twin studies are plagued by methodological problems and the failure to control for the common environmental influences shared by reared-apart twins.

An example of the problems with case histories of allegedly reared-apart twins is evidenced in a 1952 report of 18-year-old Mexican-American identical twins Esther and Elvira. Although the girls were separated at nine months, Elvira soon returned to her mother’s home, while Esther was sent to live with another relative. For eight years following their separation the twins lived “in neighboring houses, perhaps a couple of hundred feet apart.”⁴⁵ Their mother reported that the girls played together, had the same type of clothing and toys, and “were aware of their twin relationship.”⁴⁶ Although the girls became geographically separated at age nine, they continued to maintain contact with each other, including yearly visits in the summertime. As an adolescent Elvira was beaten by her “brutal” stepfather, who threw her out of the house. She was subsequently sent to a correctional institution because of her delinquency. Around this time, Esther returned to her mother’s home determined to be reunited with her twin: “Her one desire was to be with her twin, just as the latter’s was to be with her. . . . the bond between the girls was a close one.”⁴⁷ Soon, Esther was sent to a correctional school for delinquency different from the one to which Elvira had been sent. Esther escaped from this school, while Elvira was on release from her school “very much upset, and determined to find Esther.” The girls were picked up and sent to the same school where they “proved devoted to each other.”⁴⁸ At the age of 18, Esther,

who unlike Elvira, “had not basked in warm mother love throughout her formative years,”⁴⁹ was found dead of a morphine overdose in the hallway of a big city hotel.

Clearly, these “reared-apart” twins were raised in different branches of the same family and had considerable contact and a strong twinship bond. Although genetically-oriented reviewers such as Adrian Raine considered the handful of reported reared-apart concordant pairs as “clear evidence for the role of genetic factors,” Susan Farber viewed Esther and Elvira’s case as typical of the “dubious separation” found in many stories of reared-apart twins.⁵⁰ She concluded, “There is no substantive evidence in the twin reared-apart data to support the claim that genetic determination is significant in this area [crime], and there is much to support the idea that environment is potent.”⁵¹

Does Greater Identical Twin Concordance Point to a Genetic Predisposition to Crime?

According to Dalgard and Kringlen, the twin method requires that the “environmental conditions are in general similar for MZ and DZ pairs.” However, they concluded, “This assumption is obviously not true.”⁵² Later, they wrote that the EEA is “an assumption which today cannot be accepted.”⁵³ Dalgard and Kringlen found that 86% of their identical pairs had felt an extreme or strong interdependence, while only 36% of fraternal pairs felt this way.⁵⁴ When they grouped twins on this basis, there was no significant concordance rate difference among pairs with an “extreme or strong” level of interdependence (identicals: 6/26, or 23.2%, vs. fraternal pairs: 3/14, or 21.4%).

According to Christiansen,

The fundamental assumption underlying conclusions about heredity and environment that have usually been drawn from criminological twin studies is that the relevant environment of the two twins is (and has been) equally similar or equally different, regardless of zygosity. Stated in another way: intraindividual environmental variations must be

the same for MZ co-twins as they are for DZ co-twins. It is open to serious doubts whether this condition is fulfilled with respect to social behavior [emphasis added].⁵⁵

Christiansen wrote that “it is generally accepted that the experienced environment of MZ twins is more similar than that of DZ twins,”⁵⁶ citing several studies as evidence. Thus, the authors of two large population-based Scandinavian criminal twin studies had serious doubts about the validity of their research method.

Behavior geneticist Gregory Carey confirmed the doubts of Dalgard, Kringlen, and Christiansen. After analyzing the Danish criminal twin study data, Carey concluded in 1992,

The assumptions of the traditional twin method may be violated for phenotypes related to externalizing antisocial behavior. . . . If MZ twins influence each other more than do DZ twins—a hypothesis that cannot be rejected in this analysis—genetic effects for criminal liability may actually be small.⁵⁷

Carey, a proponent of the twin method in general, believed that the equal environment assumption was likely invalid for criminal and antisocial behavior.

The following case illustrates the likely effect of the twinship bond on identical twin concordance rates. In 1951 British investigator Lorna Wheelan chronicled the lives of a pair of reared-together British identical twins whose behavior differed greatly. The “patient” and his twin brother (whom I will call “Twin A” and “Twin B”) had been raised in an abusive and alcoholic family environment. Twin A, who was later diagnosed as an “aggressive psychopath” and was convicted of larceny, was the acknowledged “leader of the twins” from an early age.⁵⁸ Wheelan investigated the twins when they were 27-years-old, and described their divergent personalities as follows:

The patient [Twin A] has no friends, and he soon tires of acquaintances whom he makes easily; he is described as being cold-hearted, selfish and unpredictable; he never heeds advice; borrows money, is dishonest, and [is] a shiftless worker; he shows no affection or consideration for anyone—even his four children, for whom he has never accepted responsibility. His brother [Twin B] is steady, stable, modest, less quick tempered and

more ambitious. In contrast to his brother's agnosticism, he recently joined the R. C. Church.⁵⁹

We see that Twin B, upstanding citizen that he was, was nonetheless convicted as an accessory to a jewelry theft. His brother Twin A, who was living in a different part of the country, had asked him to pawn stolen jewelry for him. Twin B agreed and was subsequently arrested and convicted for the deed. Thus, vastly different identical twin brothers were concordant for criminality on the basis of the criteria used in most family, twin, and adoption studies. We should recall that Twin A was the leader of the pair, and it was probably difficult for Twin B to turn down his request in spite of his likely distaste at being involved in illegal activities. Like most of the twins recorded in the various studies, concordance for criminal behavior in this case appears to be the result of common influence and environment rather than common blood.

Contrary to genetic predictions, there is a marked difference between same-sex and opposite-sex fraternal twin concordance rates. Rosanoff found an adult criminality concordance rate for same-sex fraternal twins of 18% (5/28), but only 3% (1/32) for his opposite sex fraternal pairs. Kranz reported a same-sex fraternal rate of 23/43 (54%), and an opposite-sex fraternal rate of 7/50 (14%). Stumpfl reported rates of 7/19 (37%) and 2/28 (7%). Large differences were reported in the final publication of Christiansen's data. The rates were same-sex fraternal 56/202 (28%), and opposite-sex fraternal 14/228 (6%).⁶⁰ Eley et al. also reported higher same-sex versus opposite-sex correlations in 1999. Dalgard and Kringlen believed that the higher rate among same-sex fraternal twins "emphasizes the significance of environmental factors."⁶¹ This statement is true, but requires clarification: The difference emphasizes the role of environmental factors affecting concordance rates, which suggests that identical-fraternal concordance rate differences are also affected (or explained entirely) by environmental factors.

Behavior geneticist David Rowe attempted to test the validity of the equal environment assumption in his 1983 study of teenage twins, and concluded that the assumption is valid.⁶² According to Rowe, the EEA is supported because delinquency among his twins was not predicted by their level of association, and because identicals did not commit delinquent acts together more frequently than fraternal twins. Not surprisingly, however, these findings are problematic for reasons that include: (1) The study depended on mailed responses from twins, who were asked to self-report delinquent acts. It is unlikely that these teenage respondents were willing to honestly report antisocial (and sometimes criminal) acts. (2) Only 50% of the twins returned questionnaires, which likely biased the sample in the direction of better behaving pairs. (3) A statistically significant association between shared activities and fraternal males' delinquent behavior was found. However, as Rowe described it, he inspected the data, removed an outlier, and declared the association statistically non-significant.⁶³ (4) Rowe's test involved only a few environmental variables, while many others went unchecked. The shared activities questionnaire contained a nine-item Likert scale. Rowe calculated mean scores from the Likert scale responses, which potentially obscured important associations between answers on the ends of the scale and concordance.⁶⁴

Conclusion. The genetic basis of criminal or antisocial behavior, or any other type of behavior, is not established by a greater concordance rate or correlation among identical versus fraternal twins (see Chapter 3). Like schizophrenia, several researchers have turned to adoption studies in an attempt to disentangle possible genetic and environmental influences on crime. It is to these studies that we now turn.

Adoption Studies of Criminality

According to adoption researchers Sarnoff Mednick and Elizabeth Kandel, family and twin studies suffer from possible environmental contamination: “To address this problem, adoption studies have been utilized. These are natural experiments in which the effects of genetic and rearing influences may be separated to a relatively high degree.”⁶⁵ Like schizophrenia, Scandinavian adoption studies are frequently cited in support of a genetic predisposition for criminal behavior. Not surprisingly, however, these studies suffer from many of the invalidating flaws we saw in Chapter 7.

There have been five adoption studies of criminality, antisocial personality, or psychopathy: two minor North American studies (Crowe, Cadoret) and one minor Danish study (Schulsinger),⁶⁶ plus two major Scandinavian investigations (Bohman and colleagues in Sweden, Mednick and colleagues in Denmark). In none of these studies, however, did the researchers find evidence in support of genetic influences on violent crime. They claimed only to have found a genetic component for “petty” or “property” offenses, or for a vaguely defined notion of antisocial or psychopathic behavior.

Here, I analyze the Scandinavian studies in order to determine whether they provide evidence in support of genetic influences on crime. The studies of Crowe, Cadoret, and Schulsinger contain numerous invalidating flaws which have been documented in detail elsewhere.⁶⁷ Regarding Crowe’s study, a pair of critics wrote that it “is so far from the minimum standards of scientific adequacy that it deserves only minimal comment.”⁶⁸

Bohman and Colleagues' Swedish Study

In 1978 Swedish investigator Michael Bohman reported rates of criminality and alcoholism in a large group of Swedish male and female adoptees given up by their biological parent(s) and placed into nonrelative adoptive homes during the first three years of life. He checked the names of these adoptees and their biological and adoptive parents against the records of the Swedish Criminal Register and of the Excise Board, which maintained records on people fined for intemperance.

Bohman sought to determine whether alcoholism and criminality rates were elevated among adoptees who had a criminal or alcoholic biological parent. He found that the adopted-away sons of biological parents with a criminal record were themselves criminal at rates comparable to the expected population rate. He also performed a control study of 50 male and 50 female adoptees whose biological fathers “were among those with the most serious criminal records. . . . Most of these men had been sentenced to long terms in prison.”⁶⁹ Only 8% (4/50) of the male adopted-away biological children of these men, and 8% of controls (4/50), had criminal records. Bohman concluded, “The results suggest that there is a genetic determinant for alcoholism but not for criminality (defined as repeated offenses with long prison sentences).” Thus Bohman found no evidence of a genetic predisposition for criminality, while stating that the results “must be regarded as preliminary.”⁷⁰

In 1982 Bohman and colleagues reported the criminality rate of 862 Swedish men from the same adoptee cohort as the 1978 study. They reanalyzed the data and argued that, although there was no association between criminality in the biological parents and their adopted-away sons, genetic influences were detected if the type of offense and the use of alcohol were controlled for. The investigators claimed that “nonalcoholic petty criminals had an excess of

biologic parents with histories of petty crime but not alcohol abuse.”⁷¹ They concluded in favor of a genetic influence for petty offenses—a claim that cannot go unchallenged—but not for violent crime.

Critique. Although in 1982 Bohman et al. studied 862 male adoptees, in 1978 Bohman had studied 1,125 male adoptees. Because the 1982 study was essentially a reanalysis of the 1978 data, one must ask why the male adoptee group was reduced from 1,125 to 862, a drop of 23.4%. The investigators offered an explanation:

The subjects included all 862 men born out of wedlock in Sweden from 1930 through 1949 who were adopted at an early age by nonrelatives. Other subjects included by Bohman in preliminary analyses (Bohman, 1978) were excluded because of incomplete data, late placement, or intrafamilial adoption. The age at adoption was less than 3 years in all cases and 8 months on the average. The adoptees ranged in age from 23 to 43 years at the time of last information.⁷²

The reduction of the male adoptee group is puzzling because, as Bohman reported in his 1978 paper, all 1,125 male adoptees had been placed with nonrelatives before the age of three, and were checked against the Criminal Register. Thus, there is no indication that the 1982 adoptee group was subject to more stringent criteria than the 1978 group, and it is unclear whether the investigators were aware of the Criminal Register status of the 263 adoptees (and their relatives) who they removed from the study.

The 1982 study reported a 13% criminality rate for the adopted-away biological sons of parents with a criminal record (with or without alcohol abuse). This figure is comparable to the Swedish male population risk of 11%.⁷³ Contrary to genetic expectations, the fact that an adoptee had a criminally-registered biological parent did not lead to an elevated crime rate when compared to the population rate. The researchers presented several pages of complex statistical procedures which, they claimed, suggested a genetic predisposition for petty offenses. In addition to the problems I have mentioned, the investigators failed to pay sufficient attention to a

pair of important issues: (1) they did not indicate that the rate of index petty criminality was significantly higher than the general population expectation, and, (2) the selective placement of adoptees.

Even when using a control group, adoption researchers must demonstrate that the index group rate of the trait in question is significantly higher than the general population expectation, or more accurately, than the non-adoptee population expectation.⁷⁴ For example, Bohman stated that the general population risk for registered male criminality in Sweden was 11%. Suppose that Bohman, in his 1978 study, had found that 11% of his male adoptees with seriously offending biological fathers had criminal records, whereas only 2% of the control adoptees had a criminal record—a statistically significant difference. Contrary to the beliefs of most adoption researchers, we can draw no valid conclusions in favor of genetics from these figures because the experimental group adoptees had roughly the same criminality rate as one would expect in a randomly selected group of non-adopted Swedish males. The 2% rate among controls, however, might indicate that they experienced environments less conducive to producing criminality compared to the experimental group. In Bohman and colleagues' 1982 reanalysis, there is no indication that any group of adoptees had a rate of petty criminality higher than the population rate, which could have been determined through the records of the Criminal Register. The researchers compared adoptee groups to each other, but not to the all-important population rate.

Regarding selective placement, it is unlikely that the biological relatives of registered criminals were placed into the same types of environments as adoptees lacking such a family history. Adoptees in the Swedish study were born between 1930 and 1949, a period coinciding with a widespread belief in the inherited nature of most mental abnormalities, including antisocial behavior.⁷⁵ The world's first "racial biology" institute, the Swedish Uppsala Institute

for Race Biology, was established in 1922. The opening of the Institute is said to have inspired the creation of similar institutions in Germany.⁷⁶ Sweden passed its first eugenic sterilization law in 1934, and another law was passed in 1941 permitting eugenic sterilization for those demonstrating “an anti social way of life.”⁷⁷ The existence of such laws suggests that children with a criminal family background, easily checked through the use of registers, would not have been attractive candidates for adoption because of their perceived “hereditary taint.” According to Bohman, Swedish children “thought to be at high risk for heritable disorders were unlikely to be considered eligible for adoption.”⁷⁸ But what about children thought to be at moderate genetic risk? They might well have been included in the adoption process, even if they were considered less desirable adoptees. According to Bohman, Swedish “adoptee[s] and the adoptive parents were never informed [by the adoption authorities] about the identity or behavior of the biological parents,”⁷⁹ although in an earlier paper Bohman indicated that a child’s biological background was a factor influencing the adoption process. In a discussion of a subgroup of children from his 1971 study, Bohman wrote,

This group may be regarded as a negative selection from the primary series, in that many of the children were considered at birth, or while at the infants’ home, to be difficult to place on account of retarded development, poor heredity, or somatic complications. It often took longer to place these children in their ultimate home environment than it did the other children in this study; more than half of them spent over nine months at an institution before being placed [emphasis added].⁸⁰

It appears that a potential adoptee’s “poor heredity” was a factor in the adoption process. This could have been manifested in two ways: (1) prospective adoptive parents were informed of the biological background of the child, or (2) the authorities were reluctant to place children with “poor heredity” into the homes of “good” adoptive families. In any case, Bohman indicated that these children were placed later and spent more time in an institution than other children.

In Bohman's 1978 control study, the biological male children of fathers and mothers registered for criminality but not for alcohol abuse were recorded alcohol abusers at rates significantly higher than controls.⁸¹ Among these adopted-away biological offspring of registered criminal fathers, 9 of 50 (18%) were registered alcohol abusers, versus 2 of 50 controls (4%).⁸² Among the offspring of registered mothers, the rate of alcohol abuse is 9 of 48 (19%), versus 2 of 48 controls (4%).⁸³ Of course, one could argue that these figures suggest a genetic relationship between criminality and alcohol abuse, but a far more plausible explanation is that the children of criminally registered parents were placed into more psychologically harmful environments than were control adoptees, leading to significantly more alcoholism.

According to Bohman and Sigvardsson, "children were selected and placed . . . according to the social and occupational status of their biological parents,"⁸⁴ and in 1978 Bohman wrote that adoptees with antisocial or alcoholic biological parents were placed on average two to three months later than controls. He found that "later placement is associated with selective factors that contributed independently to poorer social adjustment later in life and hence to an increased risk of appearing in the registers."⁸⁵ If true, placement policies might account for any possible significant elevation in so-called petty offenses.

* * * * *

Bohman and colleagues' 1982 study was essentially an after-the-fact reanalysis of Bohman's 1978 data, from which the authors drew a different set of conclusions more in line with genetic thinking on the subject. Ironically, Kety, Rosenthal, and Wender used the opposite approach in their Danish schizophrenia adoption studies. For the most part, they found no

statistically significant elevation of any one diagnostic category (which is especially true if the comparisons are limited to first-degree relatives). In a 1988 article, Kety wrote,

At the prototypical end of the spectrum, chronic schizophrenia is found exclusively in the biological relatives of chronic schizophrenia patients where it occurs at a low prevalence (approximately 3%), whereas the prevalence in the biological relatives in the normal controls is negligible. The same is true for uncertain chronic schizophrenia. Latent or borderline schizophrenia was found at a 4-5% prevalence in the biological index relatives and 1% to 1.5% in the biological relatives of controls. This is also true where the symptoms are less distinct and the diagnosis is designated uncertain. Since neither in chronic nor in latent schizophrenia the results for the definite or uncertain diagnoses are statistically different, it appears justified to combine them [emphasis added].⁸⁶

Thus, Kety needed to combine his spectrum disorders into one total to find statistically significant results—and his investigation is frequently cited as producing the most compelling data in favor of the genetics of schizophrenia. Contrast this to Bohman's 1982 reanalysis, where the definition of crime was narrowed in order to find a significant genetic effect. And to my knowledge, neither Kety nor Bohman published criteria for inclusion or exclusion before the appearance of their studies. Thus, in both cases the investigators performed a post-data collection reanalyses—using opposite approaches—in order to find a statistically significant genetic effect for the trait under study. And in both studies, the researchers could very easily have concluded that they found no genetic influences on schizophrenia or criminality.

To summarize, Bohman and colleagues found no evidence for genetic influences on violent crime. Their conclusion in favor of genetic influences on petty offenses cannot be accepted due to methodological problems and potential environmental confounds.

Mednick and Colleagues' Danish Study

Mednick and colleagues' 1984 Danish Adoptees' Family criminality study is perhaps the most well-known and most frequently cited study in support of a genetic basis for criminal behavior.⁸⁷ The investigators utilized a register of 14,427 Danish adoptees placed between 1924 and 1947, which had been compiled by Kety and associates for their schizophrenia studies. They identified 13,194 adoptees (6,129 male, 7,065 female). Like most genetic studies of criminality and antisocial behavior, Mednick concentrated on the results among male subjects.

The researchers determined criminal status by checking the names of adoptees against the records of the Danish Police Record Office and a separate criminal record, the Personalia Blad. They identified adoptees having a record of court conviction, and then checked the conviction records of their biological and adoptive relatives. According to Mednick and colleagues,

The size of the population permits segregation of subgroups of adoptees with combinations of convicted and non-convicted biological and adoptive parents in a design analogous to the cross-fostering model used in behavior genetics. If neither the biological nor the adoptive parents are convicted, 13.5 percent of the sons are convicted. If the adoptive parents are convicted, and the biological parents are not, this figure rises only to 14.7 percent. However, if the adoptive parents are not convicted and the biological parents are, 20.0 percent of the sons are convicted. If the adoptive parents as well are convicted, 24.5 percent of the sons are convicted. These data favor an assumption of a partial genetic etiology.⁸⁸

They also performed a "sibling analysis," which compared rates among split-up half- and full-sibling pairs placed into different adoptive homes. Genetic theory predicts higher concordance in full-sibling pairs because they are more similar genetically. Of the 126 male-male half-sibling pairs, 31 had at least one convicted member and four pairs were concordant (concordance rate = 4/31, 12.9%). Of the 40 male-male full-sibling pairs, 15 had at least one convicted member and three pairs were concordant (concordance rate = 3/15, 20%). Although the full- versus half-sibling difference was not statistically significant, Mednick and colleagues

concluded, “The numbers are small but indicate that as the degree of genetic relationship increases, the level of concordance increases.”⁸⁹

The investigators wrote that although the evidence pointed to a genetic predisposition for property offenses, “This was not true with respect to violent crimes.”⁹⁰ This finding was elaborated upon in a subsequent article:

A significant relationship exists between parents’ convictions and property offending. A significant relationship does not exist for violent offending. . . . Genetic factors predispose to property offending but not to violent offending. If a biological predisposition to violence does exist, then it must be a result of other postconception factors [emphasis added].⁹¹

Danish adoptees at greater risk for registered criminality. It appears that Danish adoptees in general were significantly more susceptible to criminal conviction than non-adoptees. According to Mednick, 84.1% of the identified male adoptees had no conviction record, meaning that the adoptee conviction rate was about 16%.⁹² They stated that the general population rate for male conviction in Denmark was about 9%,⁹³ while criminologists Hurwitz and Christiansen put the figure at 8%.⁹⁴ As we have seen, Mednick found a conviction rate of 13.5% for male adoptees whose biological and adoptive parents had no record of conviction,⁹⁵ which means that about 827 such adoptees were registered criminals (13.5% of 6,129). However, applying the 8% Danish male conviction rate to 6,129 hypothetical members of the Danish male general population, we would expect to find only 490 registered criminals (8% of 6,129). Thus, Danish adoptees placed during the era under study were far more likely to be convicted when compared to the general population prevalence, and thereby constituted a distinct population with regard to criminal conviction.

Moreover, an 8% Danish population prevalence is probably too high. First, this rate is slightly inflated by the inclusion of adoptees, who have a higher rate. Second, it is likely that a fair percentage of the non-adopted convicted criminals had a parent with a conviction record, yet Mednick found a 13.5% conviction rate among adoptees whose adoptive (and biological) parents were not convicted. Although the Danish figures are not available, it is probable that the conviction rate among non-adoptees whose parents had no conviction record was well below 8%.⁹⁶ Thus, Danish adoptees placed between 1924 and 1947 having non-convicted biological and adoptive parents were at roughly twice the risk of being convicted versus non-adoptees with non-convicted biological parents.⁹⁷ Therefore, with regards to criminality, we cannot generalize findings among this Danish adoption cohort to the non-adopter population, Danish or otherwise. Mednick and colleagues' findings, therefore, apply only to the population of Danish adoptees.

A controversy in the schizophrenia twin study literature is relevant to this discussion. We recall that in his devastating critique of these studies, Don Jackson theorized that the unique aspects of the identical twinship might lead to higher rates of schizophrenia. If true, identical twin schizophrenia concordance rates would have been inflated, and identical-fraternal differences would not be generalizable to the single-born (non-twin) population. In response, Rosenthal and others argued that identical twins were no more likely to receive a schizophrenia diagnosis than members of the single-born population, and that the schizophrenia twin studies were therefore valid.⁹⁸ As we have seen, Danish adoptees were about twice as likely to be registered criminals than non-adoptees, meaning that the Rosenthal's argument in defense of schizophrenia twin studies restricts Mednick's generalizations to the Danish adoptee population.

Selective placement. Another problem is that, as we saw in the Swedish study, it is likely that the biological children of convicted criminals were placed into inferior rearing environments

when compared to adoptees lacking this biological background.⁹⁹ In Chapter 7 we saw that the biological background of children put up for adoption in mid-20th century Denmark was an important factor in the placement process. I should add a few points to this discussion as they relate to criminality, which in Denmark was also viewed as the result of bad heredity.

Denmark passed a law in 1935 allowing the compulsory sterilization of mentally “abnormal” people on eugenic grounds. In the same year, a panel of leading Danish medical authorities reviewed the results of the 1929 law, writing,

[The psychopaths] are often—to a larger extent than for example, the mentally retarded—asocial or antisocial (criminal); and their erotic activity and inventiveness, considered together with their fertility—often extramarital—is considerable. . . . With respect to hereditary tainted progeny the psychopaths are comparable to the more well-defined mental diseases, even though the pattern of inheritance is still unknown.¹⁰⁰

As this document suggests, the children of criminals and “psychopaths” were regarded as “hereditary tainted progeny.” Historian Bent Hansen noted that “the leading [Danish] medical experts in 1935 were ready to go very far in their pursuit of eugenic goals and social control of the marginal groups of society.” He pointed out that “there were no adverse reactions” to the 1935 document, and that “the medical world seemed to agree with the conclusions.”¹⁰¹

Between 1940 and 1945 Denmark was under Nazi occupation, which represents about one-fifth of the period during which Mednick’s adoptees were placed. The war years saw a dramatic rise in the Danish conviction rate, and Mednick included these convictions in the study.¹⁰² This period was likely marked by an even greater emphasis on eugenics, since Denmark was under the occupation of the German government of “applied racial science.” Mednick noted on several occasions that the twin studies of Stumpfl and Kranz were “tainted by their origins in Nazi Germany,”¹⁰³ which he considered “a politically unfortunate period.”¹⁰⁴ However, he failed

to highlight fact that about 20% of the period in which his Danish adoptees were placed, and criminals were registered, occurred during a similarly “unfortunate period” in Danish history.¹⁰⁵

Thus, the period during which adoptees were placed in Mednick’s study (1924-1947) coincided with a period of Danish history in which undesirable traits were seen largely as the product of bad genes; so much so that the authorities passed laws in an attempt to prevent the alleged carriers of these genes from reproducing. According to Mednick and Hutchings, a “potential problem with the adoption method is the possibility that the adoptive family is informed by the adoption agency of deviance in the biological family,” and (as seen in Chapter 7) they noted that a social worker who had read the older adoption journals “formed the impression that serious deviance in the biological parents was routinely reported to the prospective adoptive parents unless they refused the information.”¹⁰⁶

The investigators stated that 37% of the biological parents had their first conviction before their child was adopted, whereas 63% were convicted after the adoption. They produced figures showing that there was no difference between the conviction rates of adoptees placed before and after their biological parents’ conviction, and concluded, “The fact that the adoptive parents were informed of the biological parents’ criminality did not alter the likelihood that the adoptive son would be convicted of a crime.”¹⁰⁷ However, this comparison looks only at the parents and leaves out knowledge of the criminal status of other family members who, as we saw in Chapter 7, were of great interest to the adoption authorities.

Mednick and his colleagues failed to grasp the potential impact of the differing rearing environments of desirable and undesirable children. For them, prospective adoptive parents’ knowledge of the adoptee’s biological family history of criminality might cause them to expect the adoptee to commit criminal or antisocial acts, which might affect the way they perceive and

rear their adoptee. But more important is that a child's biological background, under the prevailing conditions in Denmark, meant that the child was not a desirable adoptee in the eyes of the most qualified adoptive parents who, as we have seen, were routinely provided information on the criminal records of a potential adoptee's biological family. Into what kinds of adoptive families were the adopted-away biological children of families with convicted criminals eventually placed? Most likely, they were placed into the homes of people who, for various reasons, were not qualified to adopt the most desirable children. These homes may have been more chaotic or potentially exploitative than the others. In a 1975 control study, for example, Hutchings and Mednick compared the biological and adoptive fathers of criminal adoptees (N = 143) to the biological and adoptive fathers of adoptive (non-criminal) controls (N = 143). Among the criminal adoptees, 33 (23%) had a criminally registered adoptive father, whereas only 14 (9.8%) of the control adoptive fathers were registered.¹⁰⁸ The comparison is statistically significant,¹⁰⁹ and Hutchings and Mednick added that the difference "was also reflected in the various indices of criminality such as number of recorded cases and total length of sentence."¹¹⁰

The rates among these adoptive fathers add to the evidence suggesting that criminally convicted adoptees experienced different types of family environments compared with non-criminal adoptees. In fact, a major aspect of the Adoptees' Family model compares the prevalence of the trait in question among index and control adoptive (rearing) relatives. In Rosenthal's 1970 description of how the model is used in schizophrenia, he explained that a "higher incidence among the adoptive relatives of index cases than of controls supports the view that rearing by, of, or with schizophrenics contributes to the development of the disorder."¹¹¹ Rosenthal observed that, in the Kety et al. studies,

among adoptive relatives, there was no appreciable difference between the two groups. . . . Genetic theory would predict such a finding. Most environmentalist theories would predict

a higher incidence of such disorders among the adoptive parents of the index cases as compared with the controls, but the findings do not support this prediction.¹¹²

It appears that the conviction rate difference between index and control adoptive fathers in Mednick's study is, as Rosenthal outlined, consistent with environmental predictions.

Placement factors probably influenced the previously discussed Mednick et al. "sibling analysis," which compares concordance rates among adopted-away half- and full-sibling pairs. Because the full-siblings had a more similar biological family background, they likely were placed into more similar environments than the half-sibling pairs. As noted, the concordance rate difference between the pairs was not statistically significant. Contrary to basic statistical principles, however, Mednick and colleagues claimed that a non-significant difference (based on an admittedly "small" sample) suggested a correlation between genetic relationship and concordance for registered criminality.¹¹³

In a footnote to their 1984 Science article, Mednick et al. wrote,

Among males, there was a statistically significant association between adoptee criminality and the amount of time spent in the orphanage waiting for adoption. This effect, which was not true for females, may be due to institutionalization. Or it may be a function of selection bias ("less desirable" boys adopted later and also being convicted).¹¹⁴

Thus, like Bohman, Mednick found an association between time spent in an institution and subsequent conviction, which might be due to selection bias or the effects of institutionalization. The psychological damage inflicted on children spending significant periods of time under the typically appalling and nurtureless conditions of an orphanage (particularly under the conditions of the Great Depression, foreign occupation, and war) was greater for convicted than non-convicted adoptees, and was not controlled for in this study.

Conclusion. Despite having found no evidence in support of a genetic basis for violent crime, the Mednick group typically emphasizes the theme of alleged genetic influences on

criminality in general. The investigators could have given their papers titles such as, “No Genetic Basis for Violent Crime,” or “Environmental Causes of Violence Must be Identified,” but instead used potentially misleading titles such as “Genetic Influences in Criminal Convictions: Evidence from an Adoption Cohort,” “Genetic Correlates of Criminal Behavior,” and “Predisposition to Violence.”¹¹⁵ Although the investigators believed they had found evidence for property (but not violent) crime, the high registered criminality rate among the population of adoptees suggests that their results cannot be generalized to the non-adoptivee population. In addition, the evidence suggests that Mednick’s study was confounded by selection factors in the Danish adoption process, and it is therefore unlikely that children with a criminal family background were placed into the same types of environments as children lacking such a history.¹¹⁶

Discussion

We have seen that the idea of criminality as a hereditary condition is an old one, whose “scientific” basis dates back at least to Lombroso. In the United States, the sterilization of criminals on eugenic grounds was permitted in several states. Long before the publication of Lange’s German twin study, the idea of “crime as destiny” was widespread in the North American population, including especially its most educated layer. Studying the genetics of criminality and antisocial behavior fell into disfavor in the years after World War II, with the revelations of Nazi genocide in the name of “racial hygiene.”

Since the late 1960s, however, genetic theories for most human traits have made a comeback. So too have ideas about genetic factors in criminal and antisocial behavior, although statements by genetic proponents in this area are more cautious than for other behaviors, in part because people understand that social conditions such as racism, unemployment, and poverty contribute greatly to criminal behavior. Most genetic researchers also recognize that these and

other environmental factors play a role. Why then is it necessary to study the genetics of criminality? According to the Mednick group,

We must try to identify the specific biological mechanisms through which heritable predispositions toward criminal behavior are expressed. By identifying these mechanisms we can learn how to successfully treat and prevent criminal behavior.¹¹⁷

The authors failed to discuss the treatments and preventive measures they had in mind, or to distinguish them from the “treatments” of previous generations. Perhaps they had in mind relatively benign measures such as early intervention programs,¹¹⁸ but they rarely discuss the possibility of improving the socioeconomic environment as a way of eliminating crime. Why focus on individuals and not the environment?

The Mednick group’s call for “treatment” is even more puzzling when we realize that they found no evidence supporting a genetic basis for violent crime, the type of offense of greatest concern to the general public. Thus, they might have concluded that social conditions must be changed in order to reduce or eliminate violent crime. Furthermore, how can there be a genetic predisposition for property crime but not for violence? How can people be predisposed to steal but not to shoot? To write bad checks but not to rape? The explanation becomes clear when the invalidating flaws of the research are exposed, which I have attempted to do in this chapter.

But suppose that future researchers present compelling evidence in support of a genetic predisposition for criminal behavior. One could still argue that the proper environmental conditions would eliminate this behavior (even among the genetically predisposed), just as the expression of a genetic disorder such as PKU is prevented with a proper diet. While the practical significance of finding a genetic predisposition for any psychiatric condition or behavioral trait is open to debate, discovering a genetic predisposition for criminal and antisocial behavior would accomplish little more than diverting society’s attention from eliminating the social conditions

leading to these behaviors. But diverting attention from environments causing crime is needed by privileged economic classes and politicians seeking to absolve themselves of responsibility for the dreadful social and material conditions of a significant part of the population. Their objective, as well as the objective of those whose research they underwrite, is to locate the causes of social problems within the bodies, minds, and genes of the oppressed.

Conclusion

The title of a 1989 review article asked whether the evidence suggesting genetic influences on criminality is explained by “bad genes or bad research.”¹¹⁹ The answer is that we have a body of methodologically flawed and environmentally confounded research. Quite erroneously, influential reviewers such as Wilson and Herrnstein have promoted the twin method as a “natural approximation to a controlled experiment for estimating the genetic involvement in a trait,”¹²⁰ and adoption studies of criminal and antisocial behavior have been promoted as “natural experiments in which the effects of genetic and rearing influences may be separated to a relatively high degree.”¹²¹ On paper, an adoption study might appear to be just such a natural experiment. In the real world of selective placement, socioeconomic differences, and attachment disturbance, these studies typically are confounded by environmental factors—to a lesser degree than family and twin studies perhaps—but confounded nonetheless.

At bottom, criminal adoption research attempted—and failed—to confirm Galton’s claim (see Chapter 2) that the adopted-away children of “wild, untamable savages” raised in “civilized” environments tend to return to a life of “contented barbarism, without a vestige of their gentle nature.”

Goddard's study of the Kallikak family traced two lines of "Martin Kallikak's" descendants. One line began with the progeny of Martin and his "good Quaker wife," whereas the "defective strains" were produced by Martin's liaison with a "feeble-minded tavern girl." For Goddard, a comparison of these two lines was pure science: "We have, as it were, a natural experiment with a normal branch with which to compare our defective side."¹²² Most of Goddard's contemporaries agreed that family pedigree studies (compiled by non-blinded investigators) were true "natural experiments" of the influences of heredity and environment. One day we will look upon twin studies and most adoption studies in much the same way as we now view the folly of Goddard's logic.

In summary, family, twin and adoption studies provide no scientifically acceptable evidence for the existence of a genetic predisposition for any type of "criminal," "psychopathic," or "antisocial" behavior, however it has been defined at any given time or in any given society. Finally, given (1) the potential social impact of criminal genetic research, which includes the further unwarranted stigmatization of ethnic minorities; (2) the well-known social factors leading to crime; and (3) the political aspects of deciding who is and is not labeled a criminal, it is questionable whether this type of research should even be performed.

¹ This chapter is based on a revised and updated version of a previous publication in The Journal of Mind and Behavior (Joseph, 2001c).

² The terms "antisocial" and "psychopath" are political and moral judgments that have been transformed into "mental illness." Were it not for the fact that it would make for more difficult reading, I would place these terms in quotation marks every time they are used.

³ Brunner et al., 1993; Rowe, 2002; Wassermann & Wachbroit, 2001. For a review of the "XYY fiasco," see Hubbard & Wald, 1993.

⁴ Gould, 1981, p. 124.

⁵ Lombroso, 1968, pp. 365-366.

⁶ Davenport, 1911, pp. 262-263. See Allen, 2001, for a critical discussion of Davenport's views on crime.

⁷ See Fink, 1938, for a review.

⁸ Hall, 1914, p. 87.

⁹ Irvine, 1903, p. 750.

¹⁰ Ochsner, 1899.

¹¹ Ibid., p. 867.

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- ¹² Ibid., p. 868.
- ¹³ Quoted in Reilly, 1991, pp. 46-47.
- ¹⁴ Sharp, 1909, pp. 1897-1898.
- ¹⁵ Ibid., p. 1901.
- ¹⁶ Fink, 1938.
- ¹⁷ See Rafter, 1988.
- ¹⁸ Lombroso, 1968, p. 161.
- ¹⁹ Davenport, 1911, p. 183.
- ²⁰ Ibid., p. 92.
- ²¹ Dugdale, 1910, p. 65. Commenting on Dugdale's book, Fink (1938, p. 179) wrote, "Perhaps no one book in the field of criminology in America has lent itself to such partisan interpretation as has Richard Dugdale's The Jukes, published in 1877. Unread, misread, or willfully distorted, it has been used by hereditarians and environmentalists alike to assert and supposedly to prove their respective positions."
- ²² Goddard, 1927, p. 54.
- ²³ Goldsmith & Gottesman, 1996, p. 9.
- ²⁴ Popenoe, 1936, p. 388.
- ²⁵ Hubbard & Wald, 1993, p. 105.
- ²⁶ Rutter, 1996, p. 2.
- ²⁷ Hurwitz & Christiansen, 1983, pp. 42-43.
- ²⁸ Duster, 1990, p. 97.
- ²⁹ P. Taylor, 1996, p. 137.
- ³⁰ Brennan et al., 1991, p. 232.
- ³¹ Wetzell, 2000, p. 157.
- ³² Lange, 1930, p. 46.
- ³³ Rosanoff, Handy, & Rosanoff, 1934, p. 929.
- ³⁴ Wetzell, 2000.
- ³⁵ Cited in Christiansen, 1977b, p. 72.
- ³⁶ Quoted in Wetzell, 2000, p. 277.
- ³⁷ Dalgard & Kringlen, 1976, p. 231. Emphasis in original.
- ³⁸ $P < .0001$. Christiansen, 1977a.
- ³⁹ Cloninger & Gottesman, 1987.
- ⁴⁰ Lyons et al., 1995.
- ⁴¹ Lyons, 1996, p. 63.
- ⁴² M. Daly, discussion in Lyons, 1996, p. 71.
- ⁴³ e.g., Eley et al., 1999; Rowe, 1986.
- ⁴⁴ Grove et al., 1990.
- ⁴⁵ Schwesinger, 1952, p. 40.
- ⁴⁶ Ibid., p. 40.
- ⁴⁷ Ibid., p. 42.
- ⁴⁸ Ibid., p. 42.
- ⁴⁹ Ibid., p. 46.
- ⁵⁰ Raine, 1993, p. 59; Farber, 1981, p. 51.
- ⁵¹ Ibid., p. 229.
- ⁵² Dalgard & Kringlen, 1976, p. 214.
- ⁵³ Ibid., p. 223.
- ⁵⁴ Ibid., p. 224. In a discussion of the Dalgard & Kringlen study, Cloninger & Gottesman (1987, pp. 98-99) wrote, "As expected, a slightly greater proportion of MZ twins than of DZ twins were psychologically close (84% of 31 vs. 74% of 54)." However, they were looking at the concordance figures of twins' level of "intra-pair interdependence" in Dalgard & Kringlen's Table 12 (1976, p. 224), which compared concordance rates among a select group. When Dalgard & Kringlen reported information on their entire sample of interviewed pairs (Dalgard & Kringlen, 1976, p. 224, Table 11), we find that 42 of 49 identical pairs (86%) had an "extremely strong" or "strong" level of closeness, which was true for only 32 of the 89 fraternal pairs (36%). Seven identical pairs (14%) were as close as ordinary siblings, which was true for 57 (64%) of fraternal.
- ⁵⁵ Christiansen, 1977a, p. 93.

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- ⁵⁶ Ibid., p. 94.
- ⁵⁷ Carey, 1992, p. 21.
- ⁵⁸ Wheelan, 1951, p. 134.
- ⁵⁹ Ibid., p. 136.
- ⁶⁰ Reported in Cloninger & Gottesman, 1987, p. 99.
- ⁶¹ Dalgard & Kringlen, 1976, p. 217.
- ⁶² Rowe, 1983.
- ⁶³ Ibid., p. 478.
- ⁶⁴ The practice of deriving mean scores from ordinal scales is potentially misleading because differences between responses are not equivalent. According to Bradley & Schaefer (1998, pp. 118-119), "It is frequently forgotten that arithmetic is not meaningful on these scales. . . . a mean is not an appropriate statistic to calculate for the Likert scale or, in fact, for any ordinal data. Mathematically, the use of a mean requires a scale that is unique up to positive linear transformation, that is, at least an interval scale. . . . The appropriate statistic to use for this data is a frequency count."
- ⁶⁵ Mednick & Kandel, 1988, p. 103.
- ⁶⁶ Cadoret, 1978; Crowe, 1972, 1974; Schulsinger, 1977.
- ⁶⁷ Gottfredson & Hirschi, 1990; Joseph, 2001c; Walters & White, 1989.
- ⁶⁸ Gottfredson & Hirschi, 1990, pp. 59-60.
- ⁶⁹ Bohman, 1978, p. 272.
- ⁷⁰ Ibid., p. 276.
- ⁷¹ Bohman et al., 1982, p. 1233.
- ⁷² Ibid., p. 1234.
- ⁷³ Ibid., p. 1235.
- ⁷⁴ Boyle, 1990.
- ⁷⁵ Broberg & Tydén, 1996. It is also known that there were close contacts between Swedish and Nazi-era German scientists and eugenicists (Weingart, 1999).
- ⁷⁶ Broberg & Tydén, 1996, p. 87.
- ⁷⁷ Ibid., p. 108.
- ⁷⁸ Bohman et al., 1982, p. 1234.
- ⁷⁹ Ibid., p. 1234.
- ⁸⁰ Bohman, 1971, p. 6.
- ⁸¹ Bohman, 1978, p. 274, Table 6.
- ⁸² $p = .026$, Fisher's Exact Test, one-tailed.
- ⁸³ $p = .025$, Fisher's Exact Test, one-tailed.
- ⁸⁴ Bohman & Sigvardsson, 1980, p. 348.
- ⁸⁵ Bohman, 1978, p. 275.
- ⁸⁶ Ingraham & Kety, 1988, pp. 121-123.
- ⁸⁷ Mednick et al., 1984.
- ⁸⁸ Ibid., p. 892.
- ⁸⁹ Ibid., p. 893.
- ⁹⁰ Ibid., p. 891.
- ⁹¹ Mednick et al., 1988, p. 29.
- ⁹² Mednick et al., 1984, Table 1.
- ⁹³ Hutchings & Mednick, 1975.
- ⁹⁴ Hurwitz & Christiansen, 1983, p. 41.
- ⁹⁵ Mednick et al., 1984, p. 892.
- ⁹⁶ In another paper by the investigators (Kandel et al., 1988), which looked at a consecutive series of Danish children born between 1936 and 1938 who were not adopted away, 39% of the sons of "severely sanctioned" criminals were themselves recorded criminals by 1972, while 7% of the sons of non-registered fathers had been registered (p. 225).
- ⁹⁷ The higher rate among adoptees is consistent with the results of a 1997 publication from the investigators which found a correlation between early maternal rejection and adult violence (Raine et al., 1997).

⁹⁸ For a more detailed discussion of this point, see Joseph, 2001b, pp. 41-43.

⁹⁹ Kamin, 1985.

¹⁰⁰ Quoted in B. Hansen, 1996, pp. 42-43.

¹⁰¹ *Ibid.*, p. 43.

¹⁰² Hurwitz & Christiansen, 1983.

¹⁰³ Mednick & Volavka, 1980, p. 92.

¹⁰⁴ *Ibid.*, p. 95.

¹⁰⁵ Not all researchers of the genetics of criminality considered studies published during the National Socialist period to be “tainted.” For example, Fini Schulsinger wrote, “The very special eugenic ideas of the Third Reich involved some German psychiatric geneticists in the classical type of family studies on relatives of psychopathic probands. . . . Their work was carried out in the same neat way as other, respectably intended, genetic work from the famous Munich school. The results of these studies unanimously indicated that heredity plays a role in the etiology of psychopathy” (Schulsinger, 1977, pp. 112-113).

¹⁰⁶ Mednick & Hutchings, 1977, p. 161.

¹⁰⁷ Mednick et al., 1984, p. 893.

¹⁰⁸ Hutchings & Mednick, 1975, p. 109; also discussed by Kamin, 1985.

¹⁰⁹ $p = .002$, Fisher’s Exact Test, one-tailed.

¹¹⁰ Hutchings & Mednick, 1975, p. 109.

¹¹¹ Rosenthal, 1970b, p. 57.

¹¹² *Ibid.*, p. 127.

¹¹³ Mednick et al., 1984, p. 893.

¹¹⁴ *Ibid.*, p. 894.

¹¹⁵ Mednick et al., 1984; Gabrielli & Mednick, 1983; Mednick et al., 1988.

¹¹⁶ See Kamin, 1985, 1986.

¹¹⁷ Brennan et al., 1991, p. 243.

¹¹⁸ As discussed in Gabrielli & Mednick, 1983.

¹¹⁹ Walters & White, 1989.

¹²⁰ Wilson & Herrnstein, 1985, pp. 90-91.

¹²¹ Mednick & Kandel, 1988, p. 103. More recent attempts to use twin and adoption data in support of genetic influences on criminal and antisocial behavior include Rhee & Waldman, 2002, and Rowe, 2002. See Joseph, 2003, for a critique of Rhee & Waldman’s study.

¹²² Goddard, 1927, p. 68.