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# THE CYCLE OF CRIME AND SOCIALIZATION PRACTICES\*

Joan McCord\*\*

## ABSTRACT

Crime appears to be transmitted through families. This article evaluates biogenetic and sociological interpretations in the light of evidence drawn from a prospective longitudinal study. Subjects for the study came from a larger investigation of males who had been in a program designed to prevent delinquency. At the time of their introduction to the prevention program, the boys ranged in age from five to thirteen. Although the treatment program failed to better the lives of its charges, it left a legacy of carefully documented case materials that are used here to examine interacting effects of biological and environmental conditions that appear to promote or retard transmission of aggressive antisocial behavior. The evidence suggests that aggressive models promote criminality and that maternal behavior can reduce the probability that a son will imitate a criminal father.

## I. INTRODUCTION

Studies of delinquency are peppered with reports that crime runs in families. Aggressiveness and criminality among the parents of delinquents have been reported in Canada, the United States,

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\*\* Professor of Criminal Justice at Temple University. Ph.D. in Sociology, Stanford University. She is a Fellow of the International Society for Research on Aggression and the American Society of Criminology, for which she served as President for 1988-89. Her prior publications include works on causes of crime, alcoholism, psychopathy, intervention programs, and theory.

Great Britain, and Finland.<sup>1</sup> Evidence from these studies suggests that criminality has both biological and social links. Both linkages also can be inferred from studies of domestic abuse that reveal that abused children have a relatively high probability of becoming violent adults.<sup>2</sup> Over the last two decades, studies of twins and of adoption have implicated genetic factors in the transmission of behaviors related to crime. For example, Goodman and Stevenson<sup>3</sup> found a considerable amount of heritability for hyperactivity among the twins they studied—whether hyperactivity was rated by fathers, by mothers, or by teachers. Several studies have also found evidence for heritability for such related concepts as activity level, impulsivity, and desire for excitement.<sup>4</sup>

Studies comparing biological with sociological father-son pairs in terms of crime show more similarities within the biological pairs.<sup>5</sup>

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<sup>1</sup> See, e.g., S. GLUECK & E. GLUECK, *UNRAVELING JUVENILE DELINQUENCY* (1950); L. ROBINS, *DEVIAANT CHILDREN GROWN UP* (1966); Farrington, *Environmental Stress, Delinquent Behavior, and Convictions*, in 6 *STRESS AND ANXIETY* 93 (I. Sarason & C. Spielberger eds. 1979); Lewis, Pincus, Lovely, Spitzer & Moy, *Biopsychosocial Characteristics of Matched Samples of Delinquents and Nondelinquents*, 26 *J. AM. ACAD. CHILD & ADOLESCENT PSYCHIATRY* 744 (1987); McCord, *Some Child-Rearing Antecedents of Criminal Behavior in Adult Men*, 37 *J. PERSONALITY & SOC. PSYCHOLOGY* 1477 (1979); Offord, *Family Backgrounds of Male and Female Delinquents*, in *ABNORMAL OFFENDERS, DELINQUENCY, AND THE CRIMINAL JUSTICE SYSTEM* 129 (J. Gunn & D.P. Farrington eds. 1982); Pulkkinen, *Search for Alternatives to Aggression in Finland*, in *AGGRESSION IN GLOBAL PERSPECTIVE* 104 (A. Goldstein & M. Segall eds. 1983).

<sup>2</sup> Call, *Child Abuse and Neglect in Infancy: Sources of Hostility Within the Parent-Infant Dyad and Disorders of Attachment in Infancy*, 8 *CHILD ABUSE & NEGLECT* 185 (1984); Gelles, *Violence in the Family: A Review of Research in the Seventies*, 42 *J. MARRIAGE & FAM.* 873 (1980); Egeland & Sroufe, *Developmental Sequelae of Maltreatment in Infancy*, in *DEVELOPMENTAL PERSPECTIVES ON CHILD MALTREATMENT* 77 (R. Rizley & D. Cicchetti eds. 1981) [hereinafter *DEVELOPMENTAL PERSPECTIVES*]; Herrenkohl & Herrenkohl, *Some Antecedents and Developmental Consequences of Child Maltreatment*, in *DEVELOPMENTAL PERSPECTIVES*, this note, at 57; Jouriles, Barling & O'Leary, *Predicting Child Behavior Problems in Maritally Violent Families*, 15 *J. ABNORMAL CHILD PSYCHOLOGY* 165 (1987); Main & Goldwyn, *Predicting Rejection of Her Infant From Mother's Representation of Her Own Experience: Implications for the Abused-Abusing Intergenerational Cycle*, 8 *CHILD ABUSE & NEGLECT* 203 (1984); McCord, *A Forty-Year Perspective on Effects of Child Abuse and Neglect*, 7 *CHILD ABUSE & NEGLECT* 265 (1983); Widom, *Child Abuse, Neglect, and Violent Criminal Behavior*, 27 *CRIMINOLOGY* 251 (1989).

<sup>3</sup> Goodman & Stevenson, *A Twin Study of Hyperactivity. 1. An Examination of Hyperactivity Scores and Categories Derived from Rutter Teacher and Parent Questionnaires*, 30 *J. CHILD PSYCHOLOGY, PSYCHIATRY & ALLIED DISCIPLINES* 671 (1989).

<sup>4</sup> See, e.g., Goldsmith & Gottesman, *Origins of Variation in Behavioral Style: A Longitudinal Study of Temperament in Young Twins*, 52 *CHILD DEV.* 91 (1981); Pedersen, Plomin, McClearn & Friberg, *Neuroticism, Extraversion, and Related Traits in Adult Twins Reared Apart and Reared Together*, 55 *J. PERSONALITY & SOC. PSYCHOLOGY* 950 (1988).

<sup>5</sup> Bohman, Cloninger, Sigvardsson & von Knorring, *Predisposition to Petty Criminality in Swedish Adoptees*, 39 *ARCHIVES GEN. PSYCHIATRY* 1233 (1982); Crowe, *An Adoptive Study of Psychopathy: Preliminary Results from Arrest Records and Psychiatric Hospital Records*, in *GENETIC RESEARCH IN PSYCHIATRY* 95 (R. Fieve, D. Rosenthal & H. Brill eds. 1975);

In addition, the longitudinal studies carried out by Eron and Huesmann have tied aggression at age eight to aggression in offspring twenty-two years later.<sup>6</sup>

Despite the wealth of evidence revealing continuities, biological explanations have moved little beyond the speculations of geneticists that gave rise to the Eugenics Movement during the first third of the twentieth century.<sup>7</sup> Suggestions about biological ties have focused on relationships between aggression and hormones,<sup>8</sup> criminality and low autonomic arousal,<sup>9</sup> prevalence of sinistrality among some types of criminals,<sup>10</sup> and difficulties in learning found among hyperactive and conduct disordered children.<sup>11</sup> Disconcertingly, ev-

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Mednick, Gabrielli & Hutchings, *Genetic Factors in the Etiology of Criminal Behavior*, in *THE CAUSES OF CRIME: NEW BIOLOGICAL APPROACHES* 74 (S. Mednick, T. Moffitt & S. Stack eds. 1987) [hereinafter *THE CAUSES OF CRIME*]; Schulsinger, *Psychopathy: Heredity and Environment*, in *BIOSOCIAL BASES OF CRIMINAL BEHAVIOR* 109 (S. Mednick & K. Christiansen eds. 1977) [hereinafter *BIOSOCIAL BASES*].

<sup>6</sup> Huesmann & Eron, *Cognitive Processes and the Persistence of Aggressive Behavior*, 10 *AGGRESSIVE BEHAV.* 243 (1984); Eron, Huesmann, Dubow, Romanoff & Yarmel, *Aggression and Its Correlates Over 22 Years*, in *CHILDHOOD AGGRESSION AND VIOLENCE: SOURCES OF INFLUENCE, PREVENTION, AND CONTROL* 249 (D. Crowell, I. Evans & C. O'Donnell eds. 1987).

<sup>7</sup> H. EYSENCK & G. GUDJONSSON, *THE CAUSES AND CURES OF CRIMINALITY* (1989); M. HALLER, *EUGENICS: HEREDITARIAN ATTITUDES IN AMERICAN THOUGHT* (1963); *id.* (paperback ed. 1984).

<sup>8</sup> E. MACCOBY & C. JACKLIN, *THE PSYCHOLOGY OF SEX DIFFERENCES* (1974); Maccoby & Jacklin, *Sex Differences in Aggression: A Rejoinder and Reprise*, 51 *CHILD DEV.* 964 (1980); Mednick & Volavka, *Biology and Crime*, in 2 *CRIME & JUST.: AN ANNUAL REVIEW OF RES.* 85 (N. Morris & M. Tonry eds. 1980); Olweus, *Aggression and Hormones: Behavioral Relationship With Testosterone and Adrenaline*, in *DEVELOPMENT OF ANTISOCIAL AND PROSOCIAL BEHAVIOR* 51 (D. Olweus, J. Block & M. Yarrow eds. 1986); Olweus, *Testosterone and Adrenaline: Aggressive Antisocial Behavior in Normal Adolescent Males*, in *THE CAUSES OF CRIME*, *supra* note 5, at 263.

<sup>9</sup> Farrington, *Implications of Biological Findings for Criminological Research*, in *THE CAUSES OF CRIME*, *supra* note 5, at 42; Hare, *Electrodermal and Cardiovascular Correlates of Psychopathy*, in *PSYCHOPATHIC BEHAVIOUR* 107 (R. Hare & D. Schalling eds. 1978); Mednick, *A Bio-Social Theory of the Learning of Law-Abiding Behavior*, in *BIOSOCIAL BASES*, *supra* note 5, at 1; Satterfield, *Childhood Diagnostic and Neurophysiological Predictors of Teenage Arrest Rates: An Eight-Year Prospective Study*, in *THE CAUSES OF CRIME*, *supra* note 5, at 146; Siddle, *Electrodermal Activity and Psychopathy*, in *BIOSOCIAL BASES*, *supra* note 5, at 199; Wadsworth, *Delinquency, Pulse Rates and Early Emotional Deprivation*, 16 *BRIT. J. CRIMINOLOGY* 245 (1976).

<sup>10</sup> Gabrielli & Mednick, *Sinistrality and Delinquency*, 89 *J. ABNORMAL PSYCHOLOGY* 654 (1980).

<sup>11</sup> Buikhuisen, *Cerebral Dysfunctions and Persistent Juvenile Delinquency*, in *THE CAUSES OF CRIME*, *supra* note 5, at 168; H. ELLIS, *THE CRIMINAL* (1890); *id.* (reprinted 1972); Goodman & Stevenson, *A Twin Study of Hyperactivity. 2. The Aetiological Role of Genes, Family Relationships and Perinatal Adversity*, 30 *J. CHILD PSYCHOLOGY, PSYCHIATRY & ALLIED DISCIPLINES* 691 (1989); Moffitt & Silva, *Self-Reported Delinquency, Neuropsychological Deficit, and History of Attention Deficit Disorder*, 16 *J. ABNORMAL CHILD PSYCHOLOGY* 553 (1988); Schalling, *Psychopathy-Related Personality Variables and the Psychophysiology of Socialization*, in *PSYCHOPATHIC BEHAV.* 85 (R. Hare & D. Schalling eds. 1978).

idence contradicting the suggested relationships as links appears as credible as supporting evidence.<sup>12</sup>

Unfortunately, efforts to understand how the environment interacts with biological differences in the production of crime have received little more than lip service.<sup>13</sup> Genetic studies rarely include direct measures of environmental effects. Furthermore, the most commonly used measure of heritability,  $h^2$ , devised by Falconer,<sup>14</sup> assumes the equivalence of environmental variance for monozygotic and dizygotic twins and additive effects. Both assumptions are dubious.

Several studies show that differential attractiveness influences interactions.<sup>15</sup> Dizygotic twins will be differently attractive in larger measure than are monozygotic twins and therefore, dizygotic twins are likely to be exposed to greater variation in environment.

A study of 300 children of unwed mothers<sup>16</sup> offers data suggesting an interactive effect between environment and heredity. In this study, the children were adopted within days of birth, and the adopting mothers did not know the psychological status of the biological mothers. The researchers correlated the scores for the biological mothers' emotional stability, based on an MMPI administered prior to giving birth, with the behavior evaluations of

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<sup>12</sup> See, e.g., Bohman, *Some Genetic Aspects of Alcoholism and Criminality: A Population of Adoptees*, 35 ARCHIVES GEN. PSYCHIATRY 269 (1978); Feehan, Stanton, McGee, Silva & Moffitt, *Is There an Association Between Lateral Preference and Delinquent Behavior?*, 99 J. ABNORMAL PSYCHOLOGY 198 (1990); Frost, Moffitt & McGee, *Neuropsychological Correlates of Psychopathology in an Unselected Cohort of Young Adolescents*, 98 J. ABNORMAL PSYCHOLOGY 307 (1989); Mawson & Mawson, *Psychopathy and Arousal: A New Interpretation of the Psychophysiological Literature*, 12 BIOLOGICAL PSYCHIATRY 49 (1977); Nachshon & Denno, *Violent Behavior and Cerebral Hemisphere Function*, in THE CAUSES OF CRIME, *supra* note 5, at 185; Plomin, Foch & Rowe, *Bobo Clown Aggression in Childhood: Environment, Not Genes*, 15 J. RESEARCH IN PERSONALITY 331 (1981); Riese, *Neonatal Temperament in Monozygotic and Dizygotic Twin Pairs*, 61 CHILD DEV. 1230 (1990); Schalling, *Personality Correlates of Plasma Testosterone Levels in Young Delinquents: An Example of Person-Situation Interaction?*, in THE CAUSES OF CRIME, *supra* note 5, at 283; Schmauk, *Punishment, Arousal, and Avoidance Learning in Sociopaths*, 76 J. ABNORMAL PSYCHOLOGY 325 (1970); Siddle & Trasler, *The Psychophysiology of Psychopathic Behaviour*, in FOUNDATIONS OF PSYCHOSOMATICS 283 (M. Christie & P. Mellest eds. 1981); Venables, *Autonomic Nervous System Factors in Criminal Behavior*, in THE CAUSES OF CRIME, *supra* note 5, at 110.

<sup>13</sup> For exceptions, see H. STÄTTIN & D. MAGNUSSON, *PUBERTAL MATURATION IN FEMALE DEVELOPMENT* (1990), and Udry, *Biological Predispositions and Social Control in Adolescent Sexual Behavior*, 53 AM. SOC. REV. 709 (1988), on the contribution of interaction between physical maturity and peers to adolescent deviant behavior among girls.

<sup>14</sup> D. FALCONER, *INTRODUCTION TO QUANTITATIVE GENETICS* (1960).

<sup>15</sup> For evidence and a review of such studies, see Webster & Driskell, *Beauty as Status*, 89 AM. J. SOC. 140 (1983).

<sup>16</sup> Loehlin, Willerman & Horn, *Personality Resemblances Between Unwed Mothers and Their Adopted-Away Offspring*, 42 J. PERSONALITY & SOC. PSYCHOLOGY 1089 (1982).

their children provided by their adopting mothers several years later.

Loehlin *et al.* found that the children of the least emotionally stable mothers were the most emotionally stable. Their explanation of the obtained negative correlations included biological-environmental interactions, suggesting that characteristics that would lead to poor mental health in one environment could promote good mental health in another.

Rather than address issues about how biological factors influence behavior, socio-biological research has typically attempted to answer the question "how much is inherited?" Answers to that quantitative question will vary under different circumstances. Understanding how the interactions occur, however, should transcend particular circumstances.

A common genetic approach to assessing environmental impact can be described (albeit crudely) as one which assigns to environment what remains after identifying biological impact. Such an approach, however, ignores the role of environment in realizing genetically determined characteristics. Thus, for example, the most elegant Rex Begonia will not grow without sufficient shade, warmth, and moisture. These environmental requirements for Rex Begonia, though critical, could not be detected through strategies based on "subtracting out" genetic effects from studies of healthy plants. Further, the genetic approach to assessing environmental impact overlooks the fact that some types of environments have more impact than others. For example, Peperomias are practically immune to differences in light but can be quickly killed through too much watering, whereas sunlight is crucial for the growth of Gladiolus. Hybridizers who popularized rhododendrons and azaleas in the United States combined manipulation of genetic differences with knowledge of appropriate environments to produce at least 1400 varieties of hardy blooming plants.<sup>17</sup> It seems unlikely that the interplay between genetics and environment would be less complex for human behavior.

Criminality within families could be a function of socialization practices more commonly found among families with a criminal heritage than among those without such heritage. Some differences in socialization practices could be produced through biological differences. Impatience, high activity level, and ready boredom are likely to have an impact on how a parent reacts to child rearing. Further-

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<sup>17</sup> P. LIVINGSTON & F. WEST, *HYBRIDS AND HYBRIDIZERS: RHODODENDRONS AND AZALEAS FOR EASTERN NORTH AMERICA* (1978).

more, no *a priori* grounds exist for assuming that similar socialization techniques will have similar results with children who have inherited different potentialities for aggressiveness. Regardless of the theoretical grounds for expecting differences, it would be wise to look for interactions between inherited and environmental conditions to understand the production of criminal behavior.

The present investigation assumes the possibility that some form of criminal diathesis can be genetically transmitted. As a preliminary approach to understanding the transmission, socialization practices of families in which fathers have criminal records are compared with families in which the fathers are not criminal. The analyses then turn to two questions: What child rearing characteristics—added to or interacting with a transmitted potentiality—promote the criminal behavior? And conversely, are there particular practices that serve as protective factors?

## II. METHOD

Subjects for the study came from a larger longitudinal investigation of males who had been in a program designed to prevent delinquency. The delinquency prevention program included both “difficult” and “average” youngsters living in deteriorated urban areas of eastern Massachusetts. To permit evaluation of the program, boys in the treatment group had been matched to others from similar neighborhoods and families prior to intervention. At the time of their introduction to the prevention program, the boys ranged in age from five to thirteen ( $M=10.5$ ,  $S.D.=1.6$ ). Although the treatment program failed to better the lives of its charges, it left a legacy of carefully documented case materials.<sup>18</sup>

Approximately twice a month between 1939 and 1945, counselors visited the homes of 253 boys from 232 families. The counselors appeared at various times of day and throughout the week to help the boys and their families. After each encounter, the counselors filed a detailed report that included conversations and described behavior. Covering a span of more than five years, these running records reveal the texture of family life. To avoid counting particular constellations of families more than once, this study used only one child per family in the analyses. Additionally, 18 families in

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<sup>18</sup> Results of the treatment program have been reported in McCord, *A Thirty-Year Follow-Up of Treatment Effects*, 33 *AM. PSYCHOLOGIST* 284 (1978); McCord, *Consideration of Some Effects of a Counseling Program*, in *NEW DIRECTIONS IN THE REHABILITATION OF CRIMINAL OFFENDERS* 394 (S. Martin, L. Sechrest & R. Redner eds. 1981); McCord, *Crime in Moral and Social Contexts*, 28 *CRIMINOLOGY* 1 (1990).

which the biological father could not be rated were dropped from the analyses.

In 1957, coders—who had no access to information about the subjects other than what was in the treatment records—transcribed information from the case records into categorical scales describing the parents, the boys, and family interaction.<sup>19</sup> The present study used these categorical scales, dichotomized, to investigate the impact of socialization practices.

To estimate reliability of the coding, a second rater independently read a 10% random sample of the cases. The Scott Interrater Reliability Coefficient,  $P_i$ ,<sup>20</sup> was computed to indicate relative improvement over chance agreement between two raters.<sup>21</sup> Inter-rater agreement as reflected in Scott's estimate of improvement over chance ranged from 0.55 with 80% agreement on parental conflict to 0.92 with 96% agreement regarding family structure.

As part of the selection process in 1938, *neighborhoods* were rated in terms of delinquency rates, availability of recreational facilities, and proximity to bars, railroads, and junk yards. The variable describing neighborhood contexts was dichotomized to differentiate between those in the "worst" areas, those dominated by bars and debris, and the rest.

To identify *alcoholic fathers*, information from the case records was combined with information from the fathers' criminal records (which had been gathered in the late 1930's and again a decade later). A father was considered an alcoholic if he lost jobs because of drinking, had marital problems attributed primarily to excessive drinking, received treatment for alcoholism, had been convicted at least three times for public drunkenness, or if welfare agencies repeatedly noted that heavy drinking was the source of his problems. By these criteria, almost one-third of the fathers were alcoholics.

Fathers were coded as *absent* if for at least six months prior to the boy's seventeenth birthday, the boy's domicile was not the same as that of the father. This criterion resulted in identifying the fathers of 74 boys in the study as absent.

A rating of *parental conflict* was based on counselors' reports of disagreements about the child, values, money, alcohol, or religion. Ratings could be "no indication," "apparently none," "some," or

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<sup>19</sup> See W. McCORD & J. McCORD, ORIGINS OF ALCOHOLISM (1960).

<sup>20</sup> Scott, *Reliability of Content Analysis: The Case of Nominal Scale Coding*, 3 PUB. OPINION Q. 321 (1955).

<sup>21</sup>  $P_i = (P_o - P_e) / (1 - P_e)$ , where  $P_o$  represents observed agreement between raters and  $P_e$  represents percent of agreement expected by chance, computed by summing the squared proportions of the cases in each category.



"considerable." Parents were classified as evidencing or not evidencing considerable conflict.

If frequent, noncritical interaction occurred between the mother and her son, then the *mother's attitude toward her son* was classified as "affectionate." Alternative classifications were "passively affectionate" (concerned for the boy's welfare, but little interaction); "passively rejecting" (unconcerned for the boy's welfare and interacted little); "actively rejecting" (almost constantly critical of the boy); "ambivalent" (marked alternation between affection and rejection of the child); and "no indication."

How a mother reacted when faced with problems determined the *mother's self-confidence* rating. If she showed signs of believing in her ability to handle the difficulties, then she was rated as self-confident. Alternative ratings were "no indication," "victim or pawn," and "neutral."

*Maternal restrictiveness* was rated as "subnormal" if a mother permitted her son to make virtually all his choices without her guidance. Alternative ratings were "no indication," "normal" and "overly restrictive."

*Supervision* described the degree to which a boy's activities after school were governed by an adult. Supervision could be rated "present," or alternatively, "sporadic," "absent," or "no information."

The mother's discipline was classified both by type and by consistency. *Punitive discipline* included very harsh verbal abuse as well as the use of physical force to control the boy. A parent was classified as punitive for either erratic or consistent use of such techniques. *Consistent, nonpunitive discipline* identified a parent who used praise, rewards, or reasoning to control the boy. Alternative categories were "inconsistent, non-punitive," "extremely lax, with almost no use of discipline," and "no information." Codes showing the mother's discipline as punitive and as consistent, nonpunitive were considered.<sup>22</sup>

The *aggressiveness of each parent* was rated as "unrestrained" if that parent regularly expressed anger by such activities as shouting abuses, yelling, throwing or breaking things, or hitting people. Alternative classifications were "no indication," "moderately aggressive," or "greatly inhibited." About 10% of the mothers were rated as highly aggressive and 16% of the fathers were so rated. In addition to the ratings of each parent separately, a combined rating

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<sup>22</sup> These were not, of course, independent ratings.

identified a boy as exposed or not exposed to at least one highly aggressive parent.

Criminal records for fathers were gathered in 1948, when the fathers averaged fifty-two years in age (S.D.=7.2 years). Criminal records for the sons were collected in 1978, when they averaged fifty years in age (S.D.=1.6 years). Both fathers and sons were considered criminals if the record showed a conviction for a Type-1 Index crime: theft, breaking and entering, assault, murder, rape, attempted murder, or attempted rape.

Forty-nine fathers and 69 sons were criminals. Criminal sons constituted 45% of the 49 biological father-son pairs among which fathers were criminals, and 28% of the biological father-son pairs among which fathers were not criminals. Alternatively, of the 69 sons with criminal records, 32% had criminal fathers; of the 145 noncriminal sons, 18% had criminal fathers,  $X^2_{(2)} = 4.659$ ,  $\Phi = 0.148$ ,  $p = 0.031$ .

### III. RESULTS

Comparison between families in which fathers were criminals and those in which the fathers were not criminals revealed differences that might help to explain antisocial behavior among some sons of criminals. As compared with non-criminal fathers, those who had criminal records were more likely to be alcoholics and to be absent from the homes in which their sons were reared. The criminal fathers were also more likely to be highly aggressive and punitive. Parental conflict was more likely present in their families. Furthermore, the mothers of their sons were more likely to be aggressive (Table 1).

On the other hand, families of fathers with criminal records were not more likely than families of non-criminal fathers to live in the worst neighborhoods. Nor were their sons reliably less likely to have affectionate, self-confident mothers, to have consistent and nonpunitive discipline, to be supervised or to be subject to normal control (Table 2).

Collinearity among variables linked with a father's criminality may account for some of the cross-generational concordance in criminal behavior. For example, parental alcoholism and conflict are more prevalent among families in which fathers have been criminals; these variables, rather than paternal criminality, might cause delinquency. Possibly, however, parental alcoholism and conflict may be spuriously linked with delinquency; they are more prevalent among families in which fathers have been criminals, and

**TABLE 1**  
**DIFFERENCES BETWEEN CRIMINAL & NON-CRIMINAL FATHERS**

Father:	(percent of each group)		p =
	Criminal (N = 49)	Non-criminal (N = 165)	
Father alcoholic	57	24	.000
Father absent	53	29	.002
Parental conflict	55	25	.000
Father aggressive	31	13	.003
Mother aggressive	20	7	.008
Either parent aggressive	45	20	.000

criminality might have heritable components. To account for such covariations, criminogenic and protective factors were assessed among families with criminal fathers and separately in families with-

**TABLE 2**  
**COMPARISONS BETWEEN CRIMINAL & NON-CRIMINAL FATHERS**

Father	(percent of each group)		p
	Criminal (N = 49)	Non-criminal (N = 165)	
Worst neighborhoods	29	32	>.05
Mother affectionate to son	45	48	>.05
Mother self-confident	27	30	>.05
Mother not restrictive	43	33	>.05
Boy supervised	49	60	>.05
Mother's discipline punitive	43	48	>.05
Mother consistently nonpunitive	31	30	>.05

out them. In this manner, proclivities toward crime that might be transmitted biologically were controlled. Table 3 shows the relationships to criminality of the variables found more frequently in families with criminal than with noncriminal fathers.

Except through a relation to paternal criminality, neither paternal alcoholism nor a father's absence reliably increased the probability for the sons to be criminals. The top half of Table 3 compares sons who had criminal fathers. Among them, a majority of fathers of both criminal and non-criminal sons also were alcoholics. Viewed from the alternative perspective, 50% of the 28 sons whose fathers were both alcoholics and criminals had been convicted for Index crimes; 38% of the 21 sons whose fathers were criminals but not alcoholics had been convicted for Index crimes. Parallel differences appeared between sons of the non-criminals:

**TABLE 3**  
**DIFFERENCES BETWEEN CRIMINALS & NON-CRIMINALS**

(percent of each group)

**A. Criminal Fathers**

Sons:	Criminal (N=22)	Non-criminal (N=27)	p=
Father alcoholic	64	52	NS
Father absent	50	56	NS
Parental conflict	77	37	.005
Father aggressive	45	19	.042
Mother aggressive	36	7	.012
Either parent aggressive	73	22	.000

**B. Non-Criminal Fathers**

Sons:	Criminal (N=47)	Non-criminal (N=118)	p=
Father alcoholic	34	20	NS
Father absent	34	27	NS
Parental conflict	36	21	.046
Father aggressive	19	10	NS
Mother aggressive	13	5	NS
Either parent aggressive	32	15	.016

40% of the sons of alcoholics (N=40) and 25% of the sons of nonalcoholics (N=125) were convicted.

The relationship between paternal criminality and paternal absence may account for an apparent relationship between paternal absence and criminal behavior. At least in this sample, a slightly higher proportion of non-criminals than of criminals came from homes without fathers. Viewing the proportions from the direction opposite to that shown in Table 3 indicates that sons of criminals who were present in the home were more, rather than less, likely to become criminals: 48% (N=23) versus 42% (N=26) for father being present or absent, respectively. Among the sons of non-criminals, 33% of the 48 sons whose fathers were absent and 27% of the 117 sons whose fathers were present became criminals.

The data suggest that aggressive parental models, however, are criminogenic above and beyond their relationship to paternal criminality. Table 3 shows that approximately three-out-of-four of the criminals who had criminal fathers also had been exposed to parental conflict and aggression. These proportions more than double those found among non-criminal sons of criminals and criminal sons of non-criminals. Computed in the opposite direction, the proportions evidence the degree to which parental conflict and aggressive-

ness increased probabilities that sons of criminals and of non-criminals would be criminals. In 27 families with criminal fathers, a considerable amount of parental conflict occurred, and 63% of their sons were convicted for Index crimes. In contrast, a significantly smaller proportion, 23% of sons from criminal but non-conflictful family backgrounds, were convicted,  $X^2_{(1)} = 7.933$ ,  $p < 0.005$ . In 42 families with non-criminal fathers, a considerable amount of parental conflict also occurred, and 40% of their sons were convicted for Index crimes. In comparison, only 24% from non-conflictful backgrounds had been convicted,  $X^2_{(1)} = 3.977$ ,  $p < 0.05$ . In families with criminal fathers, 22 contained at least one parent exhibiting unrestrained aggressiveness. More than two-thirds (73%) of their sons, compared with 22% of the remaining sons of criminal fathers, were convicted for Index crimes,  $X^2_{(1)} = 12.499$ ,  $p < 0.000$ . Among the 33 sons of non-criminals having a parent who exhibited unrestrained aggressiveness, 45% were convicted for Index crimes; this proportion was reliably greater than the 24% of the remaining sons of non-criminal fathers who were convicted,  $X^2_{(1)} = 5.831$ ,  $p < 0.016$ . The instigating impact of parental aggressiveness and conflict appears to accumulate. Table 4 shows the criminogenic effects of combining aggressive models with criminogenic heritage.

**TABLE 4**  
**INSTIGATING CONDITIONS AND CRIME**  
(percent of sons who were criminals)

Number of Instigating Conditions	Fathers:	
	Criminal	Non-criminal
none	(N: 18) 17	(N: 104) 21
one	(N: 13) 38	(N: 18) 38
two	(N: 18) 78	(N: 14) 50

$$X^2_{(6)} = 55.159, p < .000$$

As Table 4 indicates, sons of criminal fathers were more likely to be exposed to socializing conditions conducive to crime. Furthermore, instigating conditions interact with criminogenic heritage in such a way as to increase the potentiality for crime when aggressive parents were in open conflict.

Although criminal fathers were not more likely than non-criminal fathers to live in the worst neighborhoods or to be married to women who showed signs of being poor mothers, effects of neighborhood or family socialization practices might depend on whether the child had inherited conditions that promote criminality. To in-

spect the possibility, criminality among sons of criminals and among sons of non-criminals were examined. Table 5 displays the results. Living in unstable neighborhoods appeared to have a criminogenic

**TABLE 5**  
**DIFFERENCES BETWEEN CRIMINALS & NON-CRIMINALS**

(percent of each group)

**A. Criminal Fathers**

Sons:	Criminal (N=22)	Non-criminal (N=27)	p=
Worst neighborhoods	45	15	.018
Mother affectionate to son	23	63	.005
Mother self-confident	5	44	.002
Mother not restrictive	64	26	.008
Boy supervised	36	59	NS
Mother's discipline punitive	64	26	.008
Mother consistently nonpunitive	9	48	.003

**B. Non-Criminal Fathers**

Sons:	Criminal (N=47)	Non-criminal (N=118)	p=
Worst neighborhoods	34	31	NS
Mother affectionate to son	36	53	.046
Mother self-confident	17	35	.025
Mother not restrictive	43	29	NS
Boy supervised	45	66	.011
Mother's discipline punitive	53	46	NS
Mother consistently nonpunitive	21	33	NS

effect only on sons who had a criminogenic heritage. The relationship can be brought out by examining proportions from the alternative perspective. Fourteen of the families with criminal fathers lived in the worst neighborhoods, and 71% of the sons in these families were convicted for Index crimes. In comparison, 34% of the sons of criminals living in better neighborhoods were likewise convicted,  $X^2_{(1)} = 5.576$ ,  $p < 0.02$ . Only 30% of the 53 sons from the worst neighborhoods whose fathers were not criminal were convicted, as were 28% of the sons of non-criminal fathers reared in better neighborhoods.

Reliably lower proportions of criminals than of non-criminals had mothers who were affectionate or self-confident. Mothers appeared to be particularly influential in determining whether sons of criminal men became criminal. Maternal affection, self-confidence, and consistently nonpunitive discipline or supervision apparently helped to protect their sons from criminogenic influences. These

protective effects are brought out through examining the proportions who became criminals from various types of backgrounds.

Among the sons of criminals, for example, there were 22 men who had affectionate mothers. Although only 23% of these were convicted for Index crimes, 63% of the 27 sons of criminals whose mothers were not affectionate were convicted,  $X^2_{(1)} = 7.933$ ,  $p < 0.005$ . Differences in crime rates related to maternal affection were less dramatic among sons of non-criminal fathers: 21% of the men with affectionate mothers ( $N=80$ ) and 35% of the remaining men ( $N=85$ ) were convicted,  $X^2_{(1)} = 3.990$ ,  $p < 0.05$ .

Maternal self-confidence appeared to be an antidote to whatever criminogenic influences were transmitted from father to son. Only 1 of the 13 men who had criminal fathers and self-confident mothers was convicted for an Index crime; that 8% was reliably lower than the 58% who became criminals among the remaining 36 sons of criminals,  $X^2_{(1)} = 9.901$ ,  $p < 0.002$ .

Among sons of non-criminals, those whose mothers were self-confident ( $N=49$ ) were less likely to be convicted than those whose mothers were not self-confident ( $N=116$ ): 16% versus 34%,  $X^2_{(1)} = 5.058$ ,  $p < 0.03$ .

Among sons of criminals who had received little direction from their mothers ( $N=21$ ), 67% became criminals; the proportion was reliably greater than the 29% ( $N=28$ ) who became criminals despite more directive mothers,  $X^2_{(1)} = 7.039$ ,  $p < 0.008$ . Differences related to maternal restrictions among sons of non-criminals were not reliable.

The mother's consistent, nonpunitive discipline seemed also to be protective. Although only 13% of the sons of criminals whose mothers used consistent, nonpunitive discipline ( $N=15$ ) were convicted for Index crimes, 59% of the remaining sons of criminals ( $N=34$ ) were convicted,  $X^2_{(1)} = 8.706$ ,  $p < 0.003$ . On the other hand, 67% of the sons of criminals whose mothers used punitive discipline ( $N=21$ ) were convicted for Index crimes, although only 29% of the remaining sons of criminal fathers ( $N=28$ ) were convicted,  $X^2_{(1)} = 7.039$ ,  $p < 0.008$ . Neither comparison among the sons of non-criminals yielded a statistically reliable difference.

Supervision had only a slight effect on sons of criminals. Among sons of non-criminals, however, supervision seemed to be protective. Only 21% of the 99 supervised sons compared with 39% of the 66 unsupervised sons were convicted,  $X^2_{(1)} = 6.426$ ,  $p < 0.02$ .

Maternal affection, self-confidence, and consistently nonpuni-

tive discipline or supervision served as protections against criminogenic influences. The joint effects of these variables were analyzed by defining a scale in which affection, self-confidence, and having either consistently nonpunitive discipline (among sons of criminals) or supervision (among sons of non-criminals) were given equal weights. Table 6 shows the cumulative impact of protective factors.

**TABLE 6**  
**PROTECTIVE FACTORS AND CRIME**  
(percent of sons who were criminals)

Number of Protective Factors	Fathers:	
	Criminal	Non-criminal
none	(N: 25) 64	(N: 39) 44
one	(N: 8) 50	(N: 46) 35
two	(N: 6) 33	(N: 58) 21
three	(N: 10) 0	(N: 22) 9

$$X^2_{(9)} = 47.060, p < .000$$

Stepwise discriminant analyses indicated that instigating and protective factors contributed to criminal rates among sons both with and without heritable risk for criminality. The instigating and protective measures were more discriminating among the sons of criminals, accounting for only 9% of the variance among sons of non-criminals but accounting for 37.8% of the variance among sons of criminals (Table 7).

**TABLE 7**  
**STEPWISE DISCRIMINANT ANALYSIS:**  
(criminals distinguished from non-criminals)

A. Sons of Criminals			
	Partial R <sup>2</sup>	Prob. > F	Mean R <sup>2</sup>
Instigation	.277	.0001	.277
Protection	.140	.0088	.378
B. Sons of Non-Criminals			
	Partial R <sup>2</sup>	Prob. > F	Mean R <sup>2</sup>
Protection	.066	.0008	.066
Instigation	.025	.0433	.090

Pairs of discriminant functions were built from the two scales representing protective and instigating conditions. These functions



maximized discrimination between criminal and non-criminal sons. The functions correctly identified 18 of the 22 criminals (82%) and 21 of the 27 non-criminals (78%) whose fathers were criminals, together correctly discriminating 79.5% of the sons of criminals. Among the sons of non-criminals, the functions correctly identified 26 of the 47 criminals (55%) and 82 of the 118 non-criminals (69%), together correctly identifying 65% of the sons of non-criminals. Knowledge about socialization practices clearly provided more accurate classification than would have knowledge of biological risk alone.

#### IV. SUMMARY AND DISCUSSION

A century ago, Havelock Ellis reminded his readers of two factors in criminal heredity: "There is the element of innate disposition, and there is the element of contagion from social environment . . . . Frequently the one element alone, whether the heredity or the contagion, is not sufficient to determine the child in the direction of crime."<sup>23</sup>

Nevertheless, during most of the twentieth century, social scientists have spent their energies disputing the case for nature *or* nurture, thus making little progress toward understanding how the interactions influence behavior. This study attempted to focus attention on how environmental conditions affect those who inherit different biologically-based predispositions toward crime.

This study controlled for unknown factors that can be attributed to heritage. Admittedly, the control was incomplete, because no convincing evidence exists that all criminals are criminals through heritable characteristics. By comparing effects of socialization among sons of men who were and who were not criminals, however, heritable qualities related to crime were included in the analyses.

To gain understanding of the processes accounting for intergenerational transmission of aggression, families in which fathers had been convicted for serious crimes were compared with families in which the fathers were not known to be criminals. This comparison suggests that criminal fathers had a greater likelihood of being alcoholic, aggressive, punitive, and absent. They were also more likely than their non-criminal counterparts to be in conflict with probably aggressive wives.

On the other hand, sons of criminals were not more likely than their peers to live in the worst neighborhoods, to be rejected or sub-

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<sup>23</sup> H. ELLIS, *THE CRIMINAL* 92 (1890).

jected to maternal punitiveness, or to be deprived of competent maternal guidance.

Socialization variables fell into two sets. One set promoted crime. These "instigating conditions" were more common in families of criminal fathers than in families of non-criminal fathers. The set included parental conflict and aggression.

The second set was found with approximately equal frequency among families of both criminal and non-criminal fathers. These variables described socialization practices that seemed to reduce the likelihood of crime. The protective factors included having a self-confident mother and maternal affection. Effects of discipline as protection against criminogenic influences depended on whether the family was at genetic risk for criminality. In families having criminal fathers, nonpunitive and consistent discipline had beneficial effects. Although discipline made little difference in families without criminal fathers, supervision seemed beneficial. One may view these differences as indicating that genetically related potentialities require "fertilizer" to develop into antisocial behavior—fertilizer not available when parents provide the protections of affection and clearly specified directives.

Outcome of genetic risk depended on accompanying instigating conditions. That is, unless there was parental conflict and at least one aggressive parent, sons of criminals were not more likely to become criminals than were sons of non-criminals.

To examine joint effects of instigating and protecting factors, the scales measuring these influences were divided as close to the mean as possible. Crime rates within categories also were computed. Table 8 shows the results.

A categorical analysis of variance<sup>24</sup> evaluating the impact of paternal criminality, instigating conditions, protective factors, and their interactions indicated that each main effect was significant, and that the interaction between instigation and protection was also significant. None of the interactions with paternal criminality was significant, though the distributions show that heritable risk covaried with high instigating and low protective conditions.

Alternative explanations may account for these results. An emphasis on the social interpretation could call upon studies showing that children imitate aggression.<sup>25</sup> An emphasis on the biological

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<sup>24</sup> SAS, SAS USER'S GUIDE (1985).

<sup>25</sup> Bandura & Huston, *Identification as a Process of Incidental Learning*, 63 J. ABNORMAL & SOC. PSYCHOLOGY 311 (1961); Bandura, Ross & Ross, *Transmission of Aggression Through Imitation of Aggressive Models*, 63 J. ABNORMAL & SOC. PSYCHOLOGY 575 (1961); Hall & Cairns, *Aggressive Behavior in Children: An Outcome of Modeling or Social Reciprocity?*, 20 DE-

**TABLE 8**  
**HERITABLE RISK, INSTIGATING CONDITIONS, PROTECTIVE FACTORS**  
**AND CRIME**

(percent criminal in each group)

Father	Criminal	Non-criminal
Instigation Low & Protection High	N: 10) 0	(N: 61) 11
Instigation Low & Protection Low	(N: 8) 38	(N: 43) 35
Instigation High & Protection High	(N: 6) 33	(N: 19) 37
Instigation High & Protection Low	(N: 25) 68	(N: 42) 43

Categorical Analysis of Variance Table

source	DF	Chi-Square	Prob
Father's Criminality	1	12.11	.0005
Instigation	1	11.24	.0008
Protection	1	5.39	.0203
Instigation $\times$ Protection	1	4.86	.0275

interpretation might suggest that parental aggressiveness signifies particularly strong genetic loading on criminogenic factors.

Rather than try to decide which is more cogent, it is worth noting that biological potentialities *must* provide necessary conditions for crime. These conditions may well vary according to dimensions of criminal acts, some requiring speed and some requiring brawn, for example. Beyond these essentials, the present study indicates that biological conditions may promote or retard criminal behavior. Perhaps more importantly, the data suggest that socialization practices have a considerable effect on how the biological potentialities develop into antisocial behavior.

Evidence from the present study indicates that the protective nature of maternal warmth and competence are particularly salient in reducing genetically transmitted characteristics that promote antisocial behavior. This discovery leads to a tentative conclusion that intervention techniques designed to develop competence among parents may be particularly effective when the targets are children at high genetic risk.