Prospective Studies of Crime and Delinquency

Edited by
*Katherine Teilmann Van Dusen
and Sarnoff A. Mednick*

Prospective Studies
of Crime and Delinquency

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1 INTRODUCTION

Katherine Teilmann Van Dusen
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This introduction delineates what we consider to be three of the most important impediments to the advance of knowledge in the field of criminology. The most fundamental need is for more studies of the nature and progress of criminal and delinquent careers. The second need is for more prospective, longitudinal studies of the etiology of crime and delinquency. The third need concerns the lack of interdisciplinary research toward a more integrated understanding of delinquent and criminal behavior.

Criminal and Delinquent Careers

The birth cohort study by Wolfgang, Figlio and Sellin (1972) was heralded by many (Farrington, 1973; Erickson, 1973; Weis, 1974) as a landmark which allowed researchers to study the course of delinquency without the usual sampling biases that plagued other, cross-sectional research. For the first time, we could get a reasonable picture of when delinquency usually starts, what proportion of the population engages in delinquency, what types of delinquencies they engage in, what proportion continue, and so on. Cross sectional studies do not permit the investigation of careers because cross

sectional sampling includes only portions of careers for many of the individuals sampled. This is just one of the many problems that restricted researchers' ability to study the nature of criminal careers. On the other hand, the major difficulty with the Wolfgang study is that its results are restricted to a specific cohort in one place at one time. As has been indicated by Baltes, Cornelius and Nesselroade (1979) such cohort research requires replication in order to generalize results to other places and times.

This volume begins to fill the research gap in the field of criminology by publishing three more longitudinal studies of criminal and delinquent careers. The first is by Wolfgang and compares figures from the original Philadelphia cohort to similar figures from a later birth cohort, thus addressing one problem of the original cohort—that it represented only one point in time. The second study, by David Farrington, addresses both problems: time and place. That is, his study is also a longitudinal investigation describing the delinquent and criminal careers of youths in England, experiencing their adolescence (and adulthood) at a different time than the Wolfgang, et al. cohort.

The third study, by Guttridge, et al., examines the criminal careers of violent offenders in Denmark in much the same way that the other studies approach the analysis of more general criminal and delinquent careers: by observing age distributions, age of onset, types of offenses committed, prevalence rates, etc.

Prospective Longitudinal Research

The second critical need is for longitudinal, prospective research on the causes of crime and delinquency. As early as the time of the critiques of the Gluecks (1950), the difficulty of attributing causal status to factors that are found more among official delinquents than other youth has been acknowledged. That is, such factors may be the result of the delinquency or may be caused by the system's processing of delinquents.

The usual example is made of the family stability variable. Families in conflict are found more often among delinquents than among the general population (Chilton and Markle, 1972; Glueck and Glueck, 1950). If the family instability is established after delinquency has begun or has been officially processed, we cannot reject the possibility that at least a part of the conflict was a result rather than a cause of the delinquency. It is an old and familiar problem, but one that is still not often addressed adequately (perhaps because it is not easy to do so). It requires measurement of the "causal" variables before crime or delinquency has begun, and then a waiting period to

see who develops delinquent behavior and who does not. This type of prospective study is not often initiated.

   Nearly all of the studies in this volume are longitudinal and truly identify antecedents of crime and delinquency. In this regard, we benefit from the fact that many of the studies were conducted in European nations where such research is more feasible than in the United States. In view of the example cited above concerning the role of family in the generation of delinquency, it is particularly propitious that most of the studies measure family structure, stability and conflict and test them as antecedents of antisocial behavior. Doane and Goldstein focus on family interaction patterns to predict antisocial personality while McCord looks at a variety of family variables— parental affection, aggressiveness, discipline—as well as early childhood aggressiveness by the subjects to predict criminality many years later. Hällstrom uses family and other early experiences to predict aggression later in the lives of women. Finally, Janson incorporates a wide variety of social and familial variables such as class, welfare status, school performance, family composition, subject attitudes and early behavior to predict later criminality.

Interdisciplinary Designs

The third critical need in the literature is for interdisciplinary approaches to the study of antisocial behavior. Sociology has long been a natural and productive focal point for the study of crime. We have, however, perhaps been too extreme in excluding relevant evidence from other disciplines, notably psychology and biology as well as economics (Bordua, 1962). This attitude may be an impediment to a more complete understanding of delinquent behavior. Sociological categories distinguish high–risk groups from low–risk groups for delinquency—but there are always substantial numbers of persons who (by sociological criteria) should be delinquent but aren't, and those who should not be but are. In other words, even after using our best sociological variables, there is still considerable variance left to explain. Other disciplines have the potential for contributing new variance explanations, and on that basis alone, should be pursued and considered.

   This book cannot claim to break new ground or to constitute a revolution in interdisciplinary research. It is not a massive effort in that direction. Nevertheless some steps are taken. For instance, Høgh and Wolf test a strain theory of violent delinquent behavior including analysis of aspirations and expectations, but add the unusual (for sociologists) variable of subject IQ to help explain the relationships observed. Olweus combines situational factors

with the biological factor of testosterone levels to explain verbal and physical aggression. Van Dusen, et al combine sociological (SES) variables with genetic variables to predict criminal behavior in adopted children; while Mednick et al compare the criminogenic environment with the genetic effect of criminal parents in predicting criminal behavior. Other contributions are purely psychological, thus expanding the breadth of possible explanations for antisocial behavior. Buikhuisen, Ensminger and Kellam, Kaplan and Robbins as well as Knight et al develop complex and well thought-out models to explain several forms of antisocial behavior. Their models have a clear psychological orientation, though admitting such sociological variables as occupation, education and other indicators of social class. They also include a heavy emphasis on social psychological variables such as family and peer influences. In a psychological analysis, Magnusson predicts delinquent and criminal behavior from childhood measures of aggressive behavior.

In summary, this book, with its prospective, longitudinal approach, with its basic studies of the nature of delinquent careers, and with its stretching of disciplinary boundaries makes a substantial contribution to the existing literature on the nature and origins of delinquent and criminal behavior.

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I. CRIMINAL BEHAVIOR

2 DELINQUENCY IN TWO BIRTH COHORTS

Marvin E. Wolfgang

Followup of 1945 Birth Cohort I

The material presented here is derived from the birth cohort study conducted at the Center for Studies in Criminology and Criminal Law at the University of Pennsylvania. The first display of this work was published as *Delinquency in a Birth Cohort* in 1972.[1] The study involved analysis of a cohort of males born in 1945 who lived in Philadelphia from at least their tenth to their eighteenth birthdays. Through the use of school, police and Selective Service files, we were able to locate and gather data on 9945 boys. Since 1968 we have followed a ten percent random sample of the original cohort.

 The sample drawn consisted of 975 subjects who were representative of white and nonwhite delinquents and nondelinquents. After three years of diligent searching for the sample subjects, many could not be found. The process resulted in a working sample of 567 respondents who were interviewed on a variety of items regarding educational, marital, and occupational history, earlier gang membership, and social psychological variables. The interview was approximately one to two hours; no one located refused to respond. Questions were asked about "hidden" offenses, those

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which were committed but for which the subjects were not arrested. Each person was asked if and how often he had committed any of 24 specific crimes both before age 18 and after his 18th birthday. These items cover a full range of offenses from the very minor (disturbing the peace) to the very serious (homicide and rape). All subjects were interviewed around the time of their 25th birthday and all names were checked through police files at the time of their 26th birthday.

Methodologically, there is one additional comment to be made about the application of weighted seriousness scores for each of the offenses committed by our cohort subjects. Derived from the work Thorsten Sellin and I had done previously and reported in *The Measurement of Delinquency*,[2] a psychological scaling study, the seriousness scores denote relative mathematical weights of the gravity of different crimes. Although there are many complex and intricate kinds of relationships and multivariate analyses to be made among the many variables available in the longitudinal birth cohort study—including results from a restraint or incapacitation model on offenders up to age 30, and special analyses comparing official and self–report data and socioeconomic status—I shall focus on some transition probability data that yield information about moving from a juvenile to an adult status, with mostly descriptive bivariate analyses.

Cohort subjects who had an official arrest record after age 18, or as adults, are not racially statistically different. That is, about five percent of whites and six percent of nonwhites obtain an arrest record only after age 18. But the socially and statistically significant fact is that blacks, or nonwhites, are four times more likely to have an arrest record before and after age 18 than are whites.

We display the number of arrests per subject after age 18 by the number of arrests prior to age 18. Of the 185 subjects arrested as adults, 138 had a previous juvenile arrest as well. But most juvenile offenders (61%) avoid the stigma of arrest upon reaching adulthood; this finding is especially true for those with only one or two official offenses before age 18. Of the 22 taken into custody once or twice before age 18, 72 percent had no further arrests as adults.

Racially, again, there are significant differences. Only 28 percent of whites taken into custody as juveniles had an arrest as adults; but for nonwhites the percent is 54. We should also note that of the offenses recorded for ages 18 to 30, one third are UCR index offenses having an element of injury, theft or damage. Seventy five percent of these index offenses as well as 78 percent of the nonindex offenses were committed by men who had a juvenile arrest record. It is nonwhites who commit most of these serious offenses as adults: 84 percent with injury, 69 percent with theft, 75 percent with property

damages. In fact, from ages nine through 30, nonwhites account for nearly 80 percent of all offenses involving physical injury to victims.

What happens up to age 30? As might be expected, the possibilities of having an official arrest record increase up to 47 percent. Thus it may be said that an urban male's chance of having at least one arrest contact with the police by age 30 is nearly 50 percent.

The mean seriousness scores increase with age. As age increases up to 30, the seriousness of offenses increases. In the juvenile years seriousness scores remain relatively low and stable. In the early adult years (18 to 21) the scores increase by about 2.5 times, and they continue to increase in the next two age categories (22–25, 25–30) by more than 100 points with each increment in age.

By having information on all officially recorded offenses outside as well as within Philadelphia and up to age 30, we can show more data on the types of offender statuses. For example 459, or 47.3 percent of the cohort sample have an official record of police contact by age 30. Of the entire birth cohort, six percent are chronic by age 18. Expressed another way, 18 percent of all offenders were chronic by age 18, but now 31.4 percent of all offenders are chronic by age 30.

The chronic offender group has been further divided into those who committed their fifth offense before age 18 (early chronics) and those whose fifth offense occurred after age 18 (late chronics). Table 2–1 shows the

Table 2–1. Offense Classes by Early and Late Chronic: Percentage of Offenses

	Early Chronic (N = 72)	Late Chronic (N = 72)
Total Offenses	1012	626
Mean Number	14.1	8.7
Personal	9.6 (97)	14.5 (91)
Property	27.6 (279)	23.5 (147)
Nonindex	62.8 (636)	62.0 (388)
Injury	11.7 (118)	13.3 (83)
Theft	31.3 (317)	28.6 (179)
Weapon	5.7 (58)	8.6 (54)
Damage	12.9 (131)	8.3 (52)
Seriousness Score		
1–100	45.5 (460)	33.9 (212)
101–400	36.9 (373)	36.3 (227)
400 +	13.6 (138)	19.6 (123)

offense history differences. Early chronics have a mean number of official offenses (14.1) that is considerably higher than that of late chronics (8.7). But there is a higher likelihood that late chronics are involved in a personal offense involving injury. Early chronics are more often involved in property offenses. The differences are not great but the offenses of the late chronics also have higher seriousness scores because of the injury offenses.

Using our birth cohort data up to age 30, we worked on a report concerned with an incapacitation or restraint model. This study indicates that for each index offender incarcerated for a year in the 14 to 17 year age span, four to five index offenses would be prevented. For each adult offender incarcerated for a year between ages 18 and 25, about three to three and one-half index offenses would be prevented. The general model shows that restraint of the chronic offender would have the greatest per capita impact. The probability that an offender, after his fourth offense, will recidivate is about .80 and the likelihood that his next offense will be an index one, over the next 16 offense transitions, is, on the average, .426, ranging from .300 to .722.

The 1958 Birth Cohort II

The major objective of our 1958 cohort study is a complete replication of the 1945 Philadelphia birth cohort study. In general, we wish to establish essentially the same set of parametric estimates as developed in the previous study to determine the "cohort effects" on delinquent behavior of growing up in the 1960s and 1970s, compared to those activities expressed by a cohort some thirteen years earlier. For example, we intend to determine the differences (if any) which the data will exhibit between the two cohorts in such areas as: delinquency rates, correlates of delinquency, first and subsequent offense probabilities, age at onset of delinquency and offense accumulation, relative seriousness of offenses, offender typologies, offense switching probabilities, disposition rates, incapacitation effects and propitious intervention points.

The Cohort I and II data sets contain more than ample cases for fruitful comparative analyses. The Cohort I data contain: 9945 subjects (7043 whites and 2902 nonwhites); 3475 delinquents (2017 whites and 1458 nonwhites); and a total of 10,214 offenses (4458 by whites and 5756 by nonwhites). In comparison, the Cohort II study is much larger, reflects a much more even racial distribution and includes females. The 1958 data include: 28,338 subjects (6587 white males and 7224 nonwhite males; 6943 white females and 7584 nonwhite females); 6545 delinquents (1523 white males and 2984 nonwhite males; 644 white females and 1394 nonwhite

females); and a total of 20,089 offenses (4306 by white males and 11,713 by nonwhite males; 1196 by white females and 2874 by nonwhite females).

Incidence

Tables 2–2 and 2–3 report the frequency and race–specific offense rates (i.e., number of offenses divided by the number of subjects times the constant, 1000) for select offenses for males and females respectively. These data indicate a pronounced race differential for both sexes; both overall and for the select offenses, nonwhites have much higher offense rates. For example, nonwhite males have an offense rate for select offenses which is more than three times higher than the white male rate. Further, the rate differentials are most pronounced with respect to the serious assaultive offenses. When compared to the white male rate, the nonwhite rate is higher by a factor of 11 for homicide, 10 for rape, 11 for robbery and 4 for aggravated assault. The data reported in table 2–3 show that the race differential in offense rates applies to females as well.

Table 2–2. Number and Rate of Select Offenses by Race (Males)

Offense	White		Nonwhite		All	
	N	Rate/1000	N	Rate/1000	N	Rate/1000
Homicide	4	.6	52	7.2	56	4.1
Rape	9	1.4	96	13.3	105	7.6
Robbery	103	15.6	1223	169.3	1326	96.0
Agg. Assault	117	17.8	459	63.5	576	41.7
Burglary	454	68.9	1342	185.8	1796	130.0
Larceny	406	61.1	1353	187.3	1759	127.4
Auto Theft	193	29.3	472	65.3	665	48.2
Other Assaults	217	32.9	521	72.1	738	53.4
Arson	18	2.7	26	3.6	44	3.2
Weapons	77	11.7	398	55.1	475	34.4
Narcotics	263	39.9	474	65.6	737	53.4
Total of above	1861	282.5	6416	888.2	8277	599.3
Total of all offenses	4306	653.7	11713	1621.4	16019	1159.9

Table 2–3. Number and Rate of Select Offenses by Race (Females)

Offense	White N	White Rate/1000	Nonwhite N	Nonwhite Rate/1000	All N	All Rate/1000
Homicide	1	.1	4	.5	5	.3
Rape	1	.1	1	.1	2	.1
Robbery	4	.6	38	5.0	42	2.9
Agg. Assault	18	2.6	91	11.9	109	7.5
Burglary	21	3.0	35	4.6	56	3.9
Larceny	109	15.7	414	54.6	523	36.0
Auto Theft	8	1.2	16	2.1	24	1.7
Other Assaults	55	7.9	159	20.9	214	14.7
Arson	2	.3	5	.7	7	.5
Weapons	2	.3	22	2.9	24	1.7
Narcotics	45	6.5	58	7.6	103	7.1
Total of above	266	38.3	843	111.2	1109	76.3
Total of all offenses	1196	172.3	2874	379.1	4070	280.2

Delinquent Subgroups

Table 2–4 demonstrates, as expected, that the chronic recidivists are responsible for the majority of offenses committed by males. Their share of delinquency is about one-half for white males and nearly two-thirds for nonwhite males. Excluding one-time offenders reveals even more substantial results. For offenses committed by recidivists, white male chronics are responsible for 62.4 percent and nonwhite chronics for 71.4 percent. We also see that white male chronics constitute just 32.7 percent of white delinquents while nonwhite chronics represent 42 percent of nonwhite delinquents. It is obvious that a minority of delinquents are responsible for the majority of crimes.

Table 2–5, however, does not produce this effect for females. Here the chronic recidivists are responsible for a minority of the offenses for both races. The nonchronic recidivist is responsible for most offenses—about 42 percent for each race. Thus, for females the chronic offender category does not produce the volume of offenses for which it is responsible among males.

Table 2–4. Number and Percentage of Offenses by Delinquency
Category and Race (Males)

Category	White		Nonwhite		All	
	N	*%*	*N*	*%*	*N*	*%*
Delinquents	4306	—	11713	—	16019	—
One-time	791	18.4	1099	9.4	1890	11.8
Non-chronic recidivist	1322	30.7	3036	25.9	4358	27.2
Chronic recidivist	2193	50.9	7578	64.7	9771	61.0
Recidivists	3515	—	10614	—	14129	—
Nonchronic recidivist	1322	37.6	3036	28.6	4358	30.8
Chronic recidivist	2193	62.4	7578	71.4	9771	69.2

Table 2–5. Number and Percentage of Offenses by Delinquency
Category and Race (Females)

Category	White		Nonwhite		All	
	N	*%*	*N*	*%*	*N*	*%*
Delinquents	1196	—	2874	—	4070	—
One-time	411	34.4	804	28.0	1215	29.9
Non-chronic recidivist	506	42.3	1213	42.2	1719	42.2
Chronic recidivist	279	23.3	857	29.8	1136	27.9
Recidivists	785	—	2070	—	2855	—
Non-chronic recidivist	506	64.5	1213	58.6	1719	60.2
Chronic recidivist	279	35.5	857	35.5	1136	39.8

The examination of serious offense categories fails to alter this finding. The data indicate the profound effect which chronic recidivists have on delinquency among males. For both races, chronic offenders have far and away the greatest share of offenses, particularly the more serious violations. For example, chronics committed 68.5 percent of the index offenses: 60.7 percent of the murders, 76.2 percent of the rapes, 73.4 percent of the robberies, 65 percent of the aggravated assaults and 66.4 percent of the injury offenses. Once again, however, this degree of responsibility is not exhibited for female chronic offenders.

Violent Delinquency

Because the problem of juvenile violence appears to be of great concern to researchers and to policymakers, it seems useful to bring together some of the previous data relative to violent offenders.

We know that 1167 males, or about 8.5 percent of the 13,811 boys in the cohort, and 280 females, or about 1.9 percent of the 14,527 girls in the cohort, committed a violent offense resulting in injury to a victim. However, more instructive is the fact that these assaultive offenders represent about 26 percent of all male offenders (N = 4507) and about 14 percent of all female offenders (N = 2038). Yet only 13 percent of the males and 5 percent of the females were officially charged by the police with UCR index offenses representative of violence. Hence, by a careful scrutiny of offense descriptions, we note that there are approximately twice the number of male and female offenders who actually inflict bodily injury on their victims than the official crime code labels indicate. It should be noted, therefore, that because the 1958 birth cohort study does not depend on just the legal labels attached to behaviors, it is able to render more informed classifications of various offender and offense types.

The chance that a cohort subject will commit a violent offense, or can be designated as a violent offender, differs by race and sex. The probability that a nonwhite boy will be violent (12.4%) is three times higher than the chances for a white boy (4.1%). The probabilities for females are lower than for males but maintain the same racial differential, with nonwhite females being three times more likely than white females (2.9% versus .88%). It is more instructive to examine the probabilities for the delinquents across these groups. The probability that a nonwhite male delinquent will be criminally violent at least once during his career is .3009 compared to the probability of .1766 for a white male delinquent. Similarly, for females: nonwhite female

delinquents (.1571) are more likely than white female delinquents (.0947) to have committed at least one violent offense during their delinquent careers.

Within this context, we have been especially concerned about the probability of violent recidivism. That is, given that an offender has committed one injury offense during his/her career, what is the chance that he/she will commit at least one additional injury offense at some time before age 18? The answer is 18.2 percent if a white male, 38.1 percent if a nonwhite male, 4.9 percent if a white female and 10.9 percent if a nonwhite female. But we can be even more specific about the probabilities of going from a first to a second injury offense, from a second to a third and so forth out to at least six violent offenses for males and five violent offenses for females. These data are shown in table 2–6. For males, the probabilities of violent recidivism steadily increase from .4297 (for the chance of three, given two) to .5676 (for the probability of at least six, given five). For females, the probabilities also show a high probability of a fourth or a fifth violent offense.

Cohort Continuities

In addition to the 1958 cohort data reported above, a few observations are in order relative to the differences between the 1945 and 1958 cohorts. Our data indicate that boys who were born in 1958 and reached their eighteenth birthday in 1976 were a more violent cohort than their urban brothers born in 1945 and who turned eighteen in 1963. The former enter delinquency in

Table 2–6. Probability of Committing One or More Violent Offenses by Race and Sex

	Males			Females		
Offense Number	Nonwhites	Whites	All Offenders	Nonwhites	Whites	All Offenders
1	.3009	.1766	.2589	.1571	.0947	.1374
2	.3808	.1822	.3350	.1096	.0492	.0964
3	.4532	.2653	.4297	.1250	.3333	.1666
4	.4387	.5385	.4464	.6666	1.0000	.3333
5	.5294	.1429	.4933	1.0000	—	.6666
6	.5555	1.0000	.5676	—	—	—

about the same proportion (32.6%) as the latter (34.9%), but the more recent group is more delinquent in general and has engaged in more injurious behaviors. They are more violently recidivistic and commit more index offenses before reaching age eighteen. They start their injury offenses earlier (age 13 as compared to age 14) and continue longer. We suspect that when we examine violent offenses according to our system of grading the seriousness of each criminal event, the present cohort will be shown to have average seriousness scores that are much higher than the earlier cohort. Again, although just about the same proportion of males get into some kind of trouble with the law, the trouble they get into is more violent and more frequent, thus with more harm inflicted on the community.

   Finally, relative to social intervention and efforts to incapacitate criminally violent persons, juvenile careers should surely be taken into considerations. Our data indicate that the chronic offender is notable both in terms of his/her small proportion of all delinquents and in his/her overwhelming share of delinquencies. Thus, a criminal justice policy or practice that permits an eighteen year old offender to start adulthood with a virgin or first offense, thereby ignoring an offense—particularly a violent offense—career as a juvenile, is not adequately providing proper social protection.

Notes

   1. Wolfgang, M., R. M. Figlio, and T. Sellin. 1972. *Delinquency in a Birth Cohort.* Chicago: University of Chicago Press.
   2. Sellin, T. and M.E. Wolfgang. 1964. *Measurement of Delinquency.* New York: John Wiley and Sons.

3 OFFENDING FROM 10 TO 25 YEARS OF AGE

David P. Farrington

Advantages of Prospective and Self-Report Designs

Longitudinal research is especially useful in investigating the natural history of a phenomenon, or its course of development. It can establish the incidence and prevalence of a phenomenon and indicate whether there are continuities or discontinuities between incidence stages. The focus of this chapter is on the relationship between age and delinquent or criminal behavior.

It might be thought that a great deal is known about how delinquency varies with age, since official criminal statistics in different countries typically provide information about the ages of processed offenders. For example, in England and Wales in 1979, the peak ages of convictions for criminal offenses were 17 and 18 for both males and females. There were 6.7 convictions per 100 males aged 18; 6.6 per 100 males aged 17, 1.0 per 100 females aged 17, and 0.9 per 100 females aged 18 (Home Office, 1980). However, there are a number of problems in using official statistics to draw conclusions about the natural history of law–violating behavior.

The two major problems stem from first, the essentially cross-sectional nature of the data and second, the fact that acts leading to official processing tend to result in biased samples of all delinquent or criminal acts committed. Using cross-sectional data, it is difficult or impossible to link up persons recorded in one year with those recorded in another. Therefore, while the incidence of official delinquency in one year is known, the prevalence (or cumulative incidence over a number of years) is not. Prevalence estimates, when they can be calculated, often seem remarkably high. For example, Farrington (1981) calculated that if 1977 conviction rates in England and Wales were maintained over a generation, about 44 percent of males and 15 percent of females would be convicted of criminal offenses during their lifetimes.

The problems are not limited to prevalence. Using official statistics, it is impossible to know the extent to which offending is specialized (as opposed to generalized), or determine key information about official criminal careers (when they begin, when they end, and how long they last). For example, if the peak age for violent assault is later for males than the peak age for shoplifting, to what extent are the males who shoplifted switching to violent assault as they get older; and to what extent are a new population of males (who are violent but who did not shoplift) appearing in the criminal statistics? The available evidence suggests that, with law-violating behavior, there is a small amount of specificity superimposed on a large amount of generality (Farrington, 1979, 1982).

The problems of using offenses which lead to an official record as a measure of real offending behavior are so well known that it is unnecessary to discuss them here. Self–report and victim surveys agree that the number of offenses committed is much greater than the number leading to arrests or convictions. Other problems of official records are also well known, stemming from the fact that they are collected for administrative rather than research purposes; the use of legal rather than behavioral classifications, inconsistency in reporting by police or courts, and missing data due to deliberate destruction, human errors, or inefficiency in record keeping.

Because of these difficulties, it is unlikely that valid information about the natural history of law–violating behavior can be obtained from official criminal statistics alone. The problems outlined above, stemming from the cross-sectional nature of the data, can be overcome by carrying out longitudinal surveys. One of the best known longitudinal surveys based on official records was reported by Wolfgang, Figlio and Sellin (1972). Later work on this survey included an interview with the subjects at age 26.

One of the ways to overcome problems stemming from the under-

representative nature of official records is to obtain self-reports of delinquent and criminal behavior. A well known example of self-report research is the survey conducted by Petersilia, Greenwood and Lavin (1978).

Petersilia et al. interviewed 49 incarcerated armed robbers about their criminal careers. The survey revealed that these men had committed an average of about 200 crimes in an average 20-year career, half of which was spent in prison. The problem with recall over such a long period is that it is unlikely to be very accurate. Petersilia (1978) stated that the number of convictions reported by these men was about 74 percent of the number recorded in the files. However, this is inadequate as a validity check, since a high percentage figure could be obtained if men not convicted of a certain offense admitted convictions for it. The information needed for each offense is (a) how many men were convicted for it and admitted a conviction for it: (b) how many men were convicted for it and did not admit a conviction for it; (c) how many men were not convicted of it and admitted a conviction for it; and (d) how many men were not convicted of it and did not admit a conviction for it.

The most valid information about the course of development of delinquent and criminal behavior is likely to be obtained in a survey which combines a longitudinal design with the collection of criminal records, and with regular interviews in which self-reports are obtained. One survey of this kind, the Cambridge Study in Delinquent Development, is described in this paper. It is important to obtain basic information about the incidence, prevalence, frequency, and seriousness of different kinds of law-violating acts at different ages. In the absence of such basic information, delinquency theories may be misleading, and penal policies misconceived. The following study addresses these issues.

The Cambridge Study in Delinquent Development

The Cambridge Study in Delinquent Development is a prospective longitudinal survey of a sample of 411 males. Data collection began in 1961–62, when most of the boys were aged 8, and ended in 1980, when the youngest person was aged 25 1/2, (West, 1969; West and Farrington, 1973, 1977; Farrington and West, 1981; West, 1982).

At the time they were first contacted in 1961–62, the boys were all living in a working class area of London, England. The vast majority of the sample was chosen by taking all the boys aged 8–9 who were on the register of six state primary schools which were within a one mile radius of an established research office. There were other schools in this area, including a Roman

Catholic School, but the six state primary schools were the ones which were approached and which agreed to cooperate. In addition to 399 boys from these six schools, 12 boys from a local school for the educationally subnormal were included in the sample, in an attempt to make it more representative of the population of boys living in the area.

The boys were almost all white caucasian in appearance. Only 12, most of whom had at least one parent of West Indian origin, were black. The vast majority (371) were being brought up by parents who had themselves been reared in the United Kingdom or Eire. On the basis of their fathers' occupations, 93.7 percent could be described as working class (categories III, IV or V on the Registrar General's scale), in comparison with the national figure of 78.3 percent at that time. This was, therefore, an overwhelmingly traditional British, urban, white, working class sample.

Sources of Data

The boys were interviewed and tested in their schools when they were aged about 8, 10, and 14, by male or female psychologists. They were interviewed in the research office at about 16, 18, 21, and 24, by young male social science graduates. Up to and including age 18, the aim was to interview the whole sample on each occasion, and it was always possible to trace and interview a high proportion. For example, at age 18, 389 of the original 411 (94.6 percent) were interviewed. Of the 22 youths missing at this age, one had died, one could not be traced, 6 were abroad, 10 refused to be interviewed, and in the other 4 cases the parent refused on behalf of the youth.

At age 21, the aim was to interview only the convicted delinquents and a similarly sized, randomly chosen sample of unconvicted youths. At this age, 218 of the target group of 241 were interviewed (90.5 percent). At age 24, the aim was to interview four subgroups of youths: persisting recidivists (those with two or more convictions up to age 19 and at least one more in the next 5 years), temporary recidivists (those with two or more convictions up to age 19 and no more in the next 5 years), unconvicted youths from seriously deprived backgrounds (from large families, in poor housing, with convicted parents, and with families supported by state welfare), and a random sample of unconvicted youths. At this age, only 85 of the target group of 113 (75.2 percent) were successfully interviewed, primarily because so many of these youths had left home and were difficult to trace.

At most ages, most boys were interviewed between 5 and 11 months after their birthdays. For example, for the interview at 14, 211 of the 406 seen

were aged between 14 years 7 months and 14 years 11 months, while 97 were younger and 98 older. The median age at interview was 14 years 9 months. For the interview at 18, the median age was 18 years 7 months, and for the interview at 21 it was 21 years 5 months. There was most variability in age for the interview at 24, where the median age was 24 years 11 months. Of the 85 youths interviewed, 11 were aged 23, 34 aged 24, 23 aged 25, and 17 aged 26.

In addition to the interviews and tests with the boys, interviews with their parents were carried out by female social workers who visited their homes. These took place about once a year from when the boy was about 8 until when he was aged 14–15 and was in his last year of compulsory schooling. The primary informant was the mother, although the father was also seen in the majority of cases. Most of the parents were cooperative. By the time of the final interview, when the boy was 14–15, information had been obtained from the parents of 399 boys (97.1 per cent). The boys' teachers also filled in questionnaires about their behavior in school, when the boys were aged about 8, 10, 12 and 14. Again, the teachers were quite cooperative, and at least 94 percent of questionnaires were completed at each age.

It was also possible to make repeated searches in the central Criminal Record Office in London to try to locate findings of guilt sustained by the boys, by their parents, by their brothers and sisters, and (in recent years) by their wives. These searches were assisted by the large numbers of birth and marriage certificates obtained to supplement the information from the interviews. The searches continued until March 1980, when the youngest boy was aged 25 years 6 months. The criminal records of the boys are believed to be complete from the tenth birthday (the minimum age of criminal responsibility in England and Wales) to the twenty-fifth birthday.

Convictions at Each Age

Table 3–1 shows the number of youths first convicted for offenses committed at each age, the number of different youths convicted at each age, and the number of convictions at each age. The ages shown in this table are those at which offenses were committed rather than at the times of the convictions. There was sometimes a substantial delay between commission and conviction, especially in the case of the more serious offenses, where a youth might spend a year or more awaiting trial at the Crown Court. For example, perhaps the most serious criminal in the sample was a youth who carried out two robberies using guns, stealing more than $65,000. Both of these were

Table 3–1. Prevalence and Incidence of Convictions at Each Age

Age	Number of First Convictions*	Number of Different Boys Convicted	Number of Convictions
10	6 (1.5)	6	7
11	6 (3.0)	8	10
12	8 (5.0)	12	14
13	15 (8.7)	21	27
14	19 (13.5)	34	44
15	17 (17.7)	33	43
16	13 (20.9)	32	47
17	19 (25.7)	47	63
18	8 (27.7)	41	50
19	8 (29.7)	38	47
20	9 (31.9)	29	41
21	2 (32.4)	18	20
22	2 (32.9)	24	33
23	2 (33.4)	11	11
24	2 (33.9)	13	18
Total	136		475

*Cumulative percentage prevalence in parentheses, based on N = 401.

committed when he was aged 24, but he was not convicted for them until more than a year later, when he had passed his twenty-fifth birthday.

In this sample, the peak age for the number of different youths convicted (47) and for the number of convictions (63) was 17. By age 22, these figures had fallen by half, to 24 youths convicted and 33 convictions. By age 24, the figures were only about a quarter of their peak values, at 13 youths and 18 convictions. The peak period of official delinquency for this sample was from 14 to 20, with over 40 convictions (10 per 100 youths) at each age.

The number of youths convicted for the first time declined dramatically after the twenty-first birthday. The period from the tenth to the twenty-fifth birthday spans four legal categories in England and Wales: children (tenth to just before fourteenth birthday), young persons (fourteenth to just before seventeenth birthday), young adults (seventeenth to just before twenty-first birthday), and older adults (twenty-first birthday onwards). Children and young persons together are legally juveniles. It can be seen that 35 boys were first convicted as children, 49 as young persons, 44 as young adults, and only 8 as older adults.

Table 3–1 also shows the cumulative percentage prevalence of convictions, which reached 33.9 percent by the twenty–fifth birthday. In calculating this, 10 unconvicted youths who had emigrated before age 25 were eliminated, since they were not at risk of a known conviction for the whole period. Of the convicted youths, 5 died and one emigrated before age 25, and all 16 dead or emigrant youths are eliminated in some subsequent tables (e.g. concerning convictions between the twenty-first and twenty-fifth birthday, since none was at risk of this for the whole period). The information about death and emigration is complete only up to age 22. The information about juvenile convictions (i.e. those before age 17) is complete for all 411 youths, since inquiries were made abroad in regard to the 6 youths who had spent at least a year of their juvenile period outside England and Wales.

Convictions are only included in table 3–1 if they were of offenses normally recorded in the Criminal Record Office. This category is more or less synonymous with "serious" or "criminal" offenses. For example, no convictions for traffic offenses are included in table 3–1, nor convictions for offenses regarded as minor (e.g. public drunkenness or common assault). The most common offenses included are thefts, burglaries, and unauthorized takings of motor vehicles (q.v.).

Juvenile and Adult Convictions

Table 3–2 shows that there was a close relationship between juvenile and adult convictions. More than three-quarters of those with 4 or more juvenile convictions also had 4 or more adult convictions. Conversely, over 83 percent of those with no juvenile convictions also had no adult convictions. Of the 107 convicted as adults, the majority (55) had been convicted as juveniles. Conversely, of the 78 convicted as juveniles, less than 30 percent (23) were not convicted as adults.

Whether juvenile delinquency is followed by adult crime is part of a more general question about the probability of one conviction being followed by another. An analysis was carried out to investigate, for the first through the tenth conviction, the probability of one conviction being followed by another. This was based on 396 youths, excluding all those dead or emigrated except one dead convicted youth who had more than 10 convictions. The probability of at least one conviction was .33, since 131 of the 396 youths were convicted. The probability of those with one conviction being convicted again was .63, and for those with two convictions being convicted again it was .74.

The probability fluctuated around .72 for the next three transitions (.69,

.76, .69). After this point, the numbers became small, but the probabilities of subsequent convictions became very high. The probability of someone with a sixth conviction being reconvicted was .91, and for a seventh it was .90. After a dip to .78 for the eighth conviction, it was .86 for the ninth and .92 for the tenth. On the basis of transition probabilities, it seemed that the youths with 6 or more convictions were qualitatively different from those with 2–5, who in turn were different from those with only one conviction, who in turn were different from those with none. Once a youth had at least 6 convictions, his probability of being convicted again fluctuated around 90 percent.

The youths were divided into those with 0, 1, 2, 3, 4–5, and 6 or more convictions. This analysis was based on 397 youths, excluding all those dead or emigrated except two dead convicted youths who had 6 or more convictions. The 23 "chronic offenders" with 6 or more convictions (5.8 percent of the sample, or 17.4 percent of all the convicted youths) amassed a total of 230 convictions; an average of 10 each. They accounted for almost exactly half (49.1 percent) of the total number of 468 convictions of this sample. Fourteen of the chronic offenders were convicted between ages 10 and 13, all 23 between 14 and 16, 22 between 17 and 20, and 15 (out of 21 at risk) between 21 and 24.

Generally, the 20 youths first convicted at the earliest ages (10 to 12) tended to become the most persistent offenders, as table 3–3 shows. They averaged more convictions during every range than any other group. The

Table 3–2. Juvenile Versus Adult Convictions

Number of Juvenile Convictions*	Number of Adult Convictions				
	0	1	2–3	4+	Total
0	265	33	12	7	317
	(83.6)	(10.4)	(3.8)	(2.2)	(100%)
1	16	10	12	6	44
	(36.4)	(22.7)	(27.3)	(13.6)	(100%)
2–3	6	3	6	6	21
	(28.6)	(14.3)	(28.6)	(28.6)	(100%)
4+	1	0	2	10	13
	(7.7)	(0.0)	(15.4)	(76.9)	(100%)
Total	288	46	32	29	395
	(72.9)	(11.6)	(8.1)	(7.3)	(100%)

*Excluding 16 youths dead or emigrated before age 25.

Table 3–3. Number of Convictions per Youth at Different Ages, According to Age on First Conviction

Age on First Conviction (N)	Number of Convictions per Youth at Age:				
	10–13	14–16	17–20	21–24	10–24*
10–12 (20)	2.10	2.30	2.16	1.00	7.17
13 (15)	1.07	1.13	1.53	0.80	4.53
14 (19)	—	1.47	1.17	0.41	2.82
15 (17)	—	1.76	1.76	1.00	4.53
16 (13)	—	1.00	1.33	0.36	2.82
17 (19)	—	—	2.10	0.37	2.47
18–19 (16)	—	—	1.19	0.38	1.56
20–24 (17)	—	—	0.53	0.65	1.18

*The mean number of convictions per youth at age 10–24 is not necessarily the sum of the mean numbers in the first four columns; each figure is based only on youths at risk of conviction for the whole time period.

only slight exception to this was that, between ages 21 and 24, they were convicted at the same rate (1 per youth) as those first convicted at 15. Of the 23 youths with 6 or more convictions, 11 were first convicted at age 10–12, 6 at age 13–14, and 6 at age 15.

There was a tendency for the average number of convictions to decline with increasing age at the first conviction. The only exceptions to this (the relatively high average number of convictions of those first convicted at 15 and relatively low average number of those first convicted at 14) probably reflect the chance distribution of the "chronic offenders" (6 at age 15 and 3 at age 14). This decline was probably not an artifact of the cut-off point of this analysis at the twenty-fifth birthday. As table 3–1 shows, convictions declined considerably after the twenty-first birthday. The negative relationship between age at first conviction and total number of convictions (or length of official criminal career) would almost certainly hold if the analysis was extended to the thirtieth or fortieth birthday.

Changes in Officially Recorded Offending with Age

Table 3–4 shows changes in the percentages of youths convicted of specified offenses at different ages, and also changes with age in the number of offenses leading to conviction. The ages are inclusive, and the age ranges are consecutive, so that (e.g.) age 10–13 means from the tenth until just before

Table 3–4. Offenses Leading to Convictions at Different Ages

Percentage of youths convicted of:	Age			
	10–13 *(N = 411)*	*14–16* *(N = 411)*	*17–20* *(N = 402)*	*21–24* *(N = 395)*
Assault	0.5	0.5	3.7	2.5
Damage	0.5	1.2	3.7	1.0
Burglary	1.9	6.1	6.2	2.8
Theft				
of vehicles	1.0	7.1	7.5	2.3
from vehicles	1.9	2.2	2.7	1.0
from machines	1.0	0.5	0.5	0.3
Shoplifting	1.5	2.7	1.5	1.3
Drug use	0.0	0.0	1.5	1.5
Any of Above	6.3	13.4	17.4	7.8
Any Offense	8.5	18.0	23.6	11.6
Number of offenses per 100 youths per year of:				
Assault	0.1	0.2	1.0	0.6
Damage	0.1	0.4	1.0	0.3
Burglary	0.7	3.6	2.8	0.8
Theft				
of vehicles	0.3	2.8	3.0	0.9
from vehicles	0.7	0.8	0.7	0.3
from machines	0.2	0.5	0.3	0.1
Shoplifting	0.5	1.2	0.6	0.6
Any of Above	2.7	9.6	9.4	3.6
Any Offense	4.3	15.1	18.8	7.8

the fourteenth birthday. As before, only offenses normally recorded in the Criminal Record Office are included in this table. This means, for example, that assaults had to be quite serious (causing actual or grievous bodily harm) to be included, since common assault is not normally recorded. Only offenses leading to convictions are included in this table, not offenses "taken into consideration." Only 39 of the 475 convictions (8.2 percent) involved offenses taken into consideration, which were usually of the same kind as those leading to the conviction.

The youths were convicted of 683 offenses on their 475 occasions of conviction, showing that a youth was usually convicted of only one offense

on each occasion. The types of offenses shown in table 3–4 are chosen for comparability with those for which self-reports are available at different ages (q.v.). However, the 7 types shown in the bottom half of the table account for the majority of offenses leading to conviction. There were 115 burglaries, 103 offenses of unauthorized taking of motor vehicles, 42 thefts from shops, 37 thefts from vehicles, 30 assaults, 28 offenses of damaging property, and 16 thefts from automatic machines such as telephone boxes, cigarette machines, and parking meters—a total of 371 offenses.

Of the remaining 312, 108 were miscellaneous thefts, and 56 were offenses of "suspicious behavior" (e.g. going equipped to steal), which were often included as ancillary charges when a youth was convicted of burglary, taking vehicles or stealing from vehicles. There were 36 offenses of handling or receiving stolen property, 32 of fraud or forgery, 22 of drug use, 21 of disorderly conduct (e.g. breach of the peace or threatening behavior), 20 of possessing an offensive weapon, 11 robberies, 5 sex offenses, and 1 arson. Self-report data is available about some of these other offenses, but only at one or two ages (e.g. receiving, theft from employers, defrauding the government, possessing an offensive weapon). In the case of drug use, self-report data are available about the proportion of youths who have taken drugs but not about the number of occasions. It was thought more important to try to classify the youths as "regular" or "occasional" users than to try to obtain accurate estimates of drug consumption.

Table 3–4 shows that the peak incidence of most offenses leading to the convictions was either at 14–16 or 17–20. For taking vehicles, 7.1 percent of the youths were convicted between 14–16, and 7.5 percent between 17 and 20. There were 2.8 offenses per 100 youths per year between 14 and 16, and 3.0 between 17 and 20. For burglary, 6.1 percent of the youths were convicted between 14 and 16, and 6.2 percent between 17 and 20. There were 3.6 offenses per 100 youths per year between 14 and 16, and 2.8 between 17 and 20.

Shoplifting, stealing from vehicles, and stealing from automatic machines were offenses which tended to be most frequent at relatively early ages. The peak incidence of stealing from machines was at 10–13 (1.0 percent of the youths convicted), and for shoplifting it was 14–16 (2.7 percent). The rate of stealing from vehicles was fairly constant from 10–20, at about 0.7 or 0.8 offenses per 100 youths per year. On the other hand, assault, damaging property, and drug use tended to peak at relatively later ages. The clear peak for assault and damage was at 17–20, with 3.7 percent of youths convicted and 1.0 offenses per 100 youths per year. Drug use was equally common at 17–20 and 21–24.

In most cases, the peak rate of committing offenses not shown in table

3–4 was at 17–20. For example, miscellaneous theft reached a peak of 3.0 offenses per 100 youths per year between 17 and 20, handling or receiving reached a peak of 1.0, possessing an offensive weapon 0.7, and robbery 0.4. An exception to this general trend was fraud or forgery. There were no offenses of this kind between 10 and 13, 0.4 per 100 youths per year at 14–16, 0.7 at 17–20, and 0.9 at 21–24. It may be that fraud or forgery has yet to reach its peak in this sample.

Changes in Self-Reported Offending with Age

Table 3–5 shows changes in the percentages of youths admitting specified offenses at different ages, and also changes with age in the number of offenses admitted. The age ranges shown in this table are not inclusive or consecutive. During the interview at age 14, the youths were asked to admit offenses which they had ever committed up to that time, and to say whether they had committed each once or twice, sometimes, or frequently (Farrington, 1973). Therefore, precise information about frequency is not available at this age. It can be assumed that most acts admitted would have been committed after the tenth birthday. At age 18, the youths were asked to admit the number of offenses they had committed in the previous three years (see West and Farrington, 1977), while at ages 21 and 24 they were asked to admit the number of offenses committed in the previous two years (Knight, Osborn and West, 1977; Osborn and West, 1980). On the basis of the median ages at interview (supra.), the self-reported delinquency information is available for the period up to 14 years 9 months, from 15 years 7 months to 18 years 7 months, from 19 years 5 months to 21 years 5 months, and from 22 years 11 months to 24 years 11 months.

   With one exception, the questions asked at ages 18, 21, and 24 were exactly the same. The exception was that the burglary question at ages 21 and 24 specified "breaking and entering and then stealing money or things worth 5 pounds or more," whereas at age 18 it merely specified "breaking and entering and then stealing." The questions asked at age 14 were less comparable. For example, the incidence of burglary is calculated from the responses to four questions, "breaking into a big store, garage, warehouse, pavilion, etc," "breaking into a small shop (private tradesman) whether or not anything was stolen," "planning well in advance to get into a house, flat, etc. and steal valuables (and carrying the plan through)," and "getting into a house, flat, etc. and stealing things (Don't count cases where stealing results from planning well in advance)." A youth was counted as admitting burglary at age 14 if he admitted any of the above four acts.

Table 3–5. Self-Reported Offenses at Different Ages

Percentage of youths admitting:	Ages (adjusted to N = 387)			
	10–14	15–18	19–21	22–24
Fighting	23.8	62.3	39.5	30.3
Damage	11.9	21.2	3.6	3.6
Burglary	13.2	10.9	4.5	2.6
Theft				
of vehicles	7.5	15.2	6.4	1.8
from vehicles	9.3	13.4	4.1	2.4
from machines	14.7	19.1	2.4	2.4
Shoplifting	39.3	15.5	6.7	4.2
Drug use	0.3	31.5	20.4	18.2
Motoring Convictions	—	16.3	17.0	12.4
Number of offenses per 100 youths per year of:				
Fighting	—	272.5	71.2	42.5
Damage	—	53.7	12.8	12.8
Burglary	—	29.5	11.5	3.5
Theft				
of vehicles	—	36.3	47.5	1.2
from vehicles	—	39.4	14.5	24.2
from machines	—	48.1	2.7	4.8
Shoplifting	—	113.2	65.4	26.2
Any of Above	—	592.6	225.6	115.1
Motoring Convictions	—	10.1	10.9	8.0

Burglary is a rather extreme case, because there was no other instance where admissions at 14 were based on four questions. Admissions at 18, 21 and 24 were based on only one question. There was only one other case at age 14 where admissions were based on more than one question. The admissions for shoplifting at 14 were derived from "stealing things from big stores, supermarkets, multiple shops (while shop open)" and "stealing things from small shops or private tradesmen (shop open)." The corresponding item at later ages specified "shoplifting from shops, market stalls, stores, supermarkets, etc." Other items were more comparable at all ages. For example, "stealing goods or money from slot machines, juke boxes, telephones, etc." at 14 became "stealing from slot machines, such as gas or electricity meters, parking meters, phone boxes, cigarette machines" at 18,

21 and 24. The procedure was the same at all four ages, since the acts were presented to the youths on cards as part of a face to face interview.

The admission rates shown in table 3–5 are estimated for the sample of 387 youths (94.2 percent of the total) who were interviewed both at 14 and 18. The admission rates for these 387 at 14 were very close to those for all 406 (98.8 percent) interviewed at 14, and it was concluded that working with a sample of 387 rather than 411 introduced a negligible error (less than 1 percent). Convicted youths (and self-reported delinquency admissions) were over represented in the samples interviewed at 21 and 24, so it was necessary to adjust the admissions to what might have been expected from the whole sample. This was done very simply, and will be explained in the case of burglary, although the principles are the same in all cases.

Of the 387 youths interviewed at 14 and 18, 13.2 percent admitted burglary at 14 and 10.9 percent at 18. Only 217 youths were interviewed both at 18 and at 21. Of these 16.6 percent admitted burglary at 18 and 6.9 percent at 21. The proportional reduction in burglary between 18 and 21 for this sample was .584 (since 6.9 divided by 16.6 is .416). This reduction was then applied to the original figure of 10.9 percent of 387 to produce an estimated admission rate at 21 of 4.5 percent (10.9 $\times$ .416 = 4.5). Only 60 youths were interviewed both at 21 and 24. Of these 11.7 percent admitted burglary at 21 and 6.7 percent at 24. The proportionate reduction in burglary for this sample, then was .427. When this figure was applied to the previous estimate of 4.5 percent at age 21, it produced an estimate of 2.6 percent at age 24.

The estimated number of offenses per year was calculated in the same way. The 387 youths interviewed at 14 and 18 admitted a total of 342 burglaries (in the previous 3 years) at 18, or 29.5 per 100 youths per year. The 217 youths interviewed at 18 and 21 admitted 317 burglaries at 18 and 82 at 21, a proportionate reduction of .741. Applying this to the total of 342 burglaries for the whole sample of 387 produced an estimated number of burglaries at 21 of 89, or (in view of the two year admission period) 11.5 per 100 youths per year. The 60 youths interviewed at 21 and 24 admitted 49 burglaries at 21 and 15 at 24, a proportionate reduction of .794. Applying this to the previous estimate of 11.5 burglaries per 100 youths per year produced an estimate of 3.5 at age 24 (see table 3–5).

This estimation method is simple and rough. The estimate at age 24 is likely to be the most inaccurate, since it is based on only 60 youths. On the other hand, the youths left in the sample at ages 21 and 24 tended to be those admitting the most acts. Therefore, the reduction estimate is likely to be adequate as a measure of the future law-violating behavior of the most delinquent youths at age 18. It will only give an inaccurate estimate for the

whole sample if substantial numbers of the less delinquent youths at 18 were increasing their law-violating behavior at 21 and 24 or, at least, not decreasing it to the same extent as the more delinquent youths. This seems very unlikely. For example, considering the 217 youths interviewed at 18 and 21, 181 admitted no burglaries at 18. Of these, 173 (95.6 percent) also admitted no burglaries at 21, 5 (2.8 percent) admitted one burglary at 21, and only 3 (1.7 percent) admitted more than one burglary at 21. In general, there was a highly significant relationship between admissions at one age and admissions at the next.

Table 3–5 shows that the incidence of most offenses peaked between ages 15 and 18. During this period, 62.3 percent were involved in fights, 21.2 percent damaged property, 15.2 percent took vehicles, 13.4 percent stole from vehicles, 19.1 percent stole from machines, and 31.5 percent used drugs. However, burglary and shoplifting were more common before age 14 than between 15 and 18. The burglary result may be affected by the noncomparability of the measurements at ages 14 and 18 (supra.). The four acts were admitted by between 4.0 and 6.4 percent of the youths, although 13.2 percent admitted at least one. Both shoplifting acts at 14 were admitted by a higher proportion of the youths than admitted the corresponding act at 18, so it is reasonable to conclude that the peak age for shoplifting was before 14. After age 18, the incidence of all acts declined, although it is interesting to note that the rate of motoring convictions per 100 youths per year stayed fairly constant from 15 to 24.

It might be thought that the declining incidence between ages 18 and 21 shown in the top half of table 3–5 is affected by the recall period (three years at 18 and two years at 21). However, when the analyses were repeated for youths admitting at least one offense per year (as opposed to at least one offense) the results were virtually unchanged. For the 217 youths interviewed at 18 and 21, the average percentage admitting each of the first 7 offenses listed in table 3–5 was 30.0 percent at 18 and 12.4 percent at 21; a proportionate reduction of .587. The average percentage admitting these offenses at least once a year was 18.3 percent at 18 and 7.5 percent at 21, a very similar proportionate reduction of .601.

Comparing Official and Self-Reported Offending

The most startling difference between official and self-reported offending is in the rate of offending. The seven offenses specified in the bottom half of tables 3–4 and 3–5 were committed at a rate of nearly 10 per 100 youths per year between ages 14 and 20, according to official records of convictions.

According to self-reports, they were committed at a rate of nearly 600 per 100 youths per year from 15 to 18, and at 225 per 100 youths per year from 19 to 21.

Of course, there are problems of comparability between official and self-reported offending. The least comparable offense was assault. In the official records, it referred to relatively serious assaults, but the self-reports referred to fights, most commonly occurring in bars or streets. How many of these fights could have led to a charge of assault is uncertain. What is certain is that only a tiny fraction of assaultive behavior involving working class youths ever leads to a conviction for assault.

The least discrepancy between official records and self-reports concerned the most serious offense, burglary. This was admitted by 10.9 percent between 15 and 18 and 4.5 percent between 19 and 21. These figures are not out of line with the 6.1 percent convicted of burglary between 14 and 16 and the 6.2 percent convicted between 17 and 20. The rate per 100 youths per year was more out of line, being 11.5–29.5 according to self-reports, and 2.8–3.6 according to convictions. It was true with some other offenses that, while rates of commission were much higher according to self-reports than according to official records, the incidence of commission (the proportion of the sample committing) was less discrepant. For example, 7.1 percent were convicted of taking vehicles at 14–16 and 7.5 percent at 17–20; 15.2 percent admitted taking vehicles at 15–18 and 6.4 percent at 19–21.

A detailed comparison of convictions and self-reports for the three-year period up to the interview at 18 was carried out. (This analysis updates that described by West and Farrington, 1977, p. 28). The number of youths admitting burglary during this period was 42 (10.8 percent of the 389 interviewed), whereas the number convicted of burglary during this period was 28 (7.2 percent). Of the 28 convicted of burglary, 20 admitted burglary (71.4 percent). The total number of offenses of burglary admitted was 342, whereas the total number leading to convictions was 35. These figures suggest that only about 10 percent of burglaries led to convictions. Despite this, the self-reports and official records agreed substantially in identifying the proportion of the sample who were committing burglary.

The same pattern held with the less serious offenses, although the agreement on incidence was less. For example, 60 youths (15.4 percent of 389) admitted taking vehicles, and 25 (6.4 percent) were convicted of it. Of the 25 convicted, 19 (76 percent) admitted it. The total number of offenses of taking vehicles admitted was 423, while the total number leading to convictions was 35. Once again, there was much more agreement between official records and self-reports in identifying the offenders than in estimating the number of offenses committed.

Tables 3–4 and 3–5 agree in showing that, for most offenses, the peak age of incidence was within a year or two of the seventeenth birthday. This was true for taking vehicles, stealing from vehicles, damaging property, assault, and drug use, although assault and drug use did not decline with age as quickly as the other offenses. The peak age for shoplifting and for stealing from machines was earlier than 17. The peak age for burglary was less certain. According to official records, it was around 17, but according to self-reports it was earlier.

It was mentioned earlier that, according to official records, fraud was more common at 21–24 than at earlier ages. A question was asked at 21 and 24 about "obtaining money from the government, such as unemployment or sickness benefit, by telling lies," and the proportion admitting this declined from 21 to 24 (from 15 percent to 10 percent of 60 interviewed at both ages). Therefore, it may be that this particular kind of fraud, one of the most common committed by these working class youths, had passed its peak by age 24.

Conclusions

The major conclusions of this paper are as follows:

(1) The peak age for most offenses is within a year or two of the seventeenth birthday, although shoplifting and stealing from machines seem to peak earlier, and fraud later;

(2) There is a close relationship between juvenile and adult delinquency;

(3) The probability of one conviction following another reaches a peak of about .90 for youths with 6 or more convictions;

(4) The youths first convicted at the earliest ages (10–12) are the most persistent offenders.

The last three of these conclusions are in agreement with existing research. In particular, Wolfgang (1973, 1974) reported a significant relationship between juvenile and adult arrests. It is clear from his figures that the probability of one arrest following another reaches a peak of about .80 for youths with 6 or more arrests. Wolfgang also reported that a small proportion of "chronic offenders" accounted for a large proportion of all the arrests. Hamparian, Schuster, Dinitz and Conrad (1978) found a beautiful straight line (negative) relationship between the age of first arrest and the average number of arrests. The average number of arrests declined from 7.27 (first arrest 10 or less) to 6.16 (first arrest 11) to 5.25 (first arrest 12) to 4.10 (first arrest 13), and so on.

The first conclusion agrees with cross–sectional trends in the official

criminal statistics. However, to my knowledge, these are the only published data based on longitudinal research and including self-reported as well as official delinquency, although similar data are now being collected by Ageton and Elliott in Colorado. The trends in the official statistics could have been produced artifactually, by people committing less visible offenses as they grow older, or by police enforcement patterns which might be especially likely to detect the kinds of crimes committed by 17 year olds. The fact that self-reported and official delinquency tend to peak at about the same age suggests that there is a real peak in law-violating behavior around the age of 17. Other results also suggest that there is a concurrent peak in other kinds of deviant behavior, such as drinking alcohol and sexual promiscuity.

It might be argued that results obtained by self-reports should only be given credence insofar as it can be demonstrated that the self–report technique is valid. In the light of an exhaustive review of the literature, Hindelang, Hirschi and Weis (1981, p. 10) concluded that the "validity estimates for self-report instruments were often well within the range of acceptability for social science measurement," and that "the results of self-report research did not behave as though there was something basically wrong." In the present research, West and Farrington (1977) found that 94 percent of convicted youths admitted that they had been convicted, and that less than 1 percent of unconvicted youths "clearly and deliberately claimed false conviction records" (p. 23). As noted above, over 70 percent of youths convicted of specified offenses admitted that they had committed those offenses. However, the validity of self-report instruments is less important than the agreement between results obtained with self-reported and official delinquency. Both measures are likely to be biased, in different ways, and if the same results are produced by both, these results are likely to hold for delinquent behavior rather than to be produced artifactually by biasing factors.

`The present results have limitations, of course. They are based on one cohort of white English working class urban males born about 1953. How far they might apply to other cohorts, to blacks, to Americans, to middle class people, to rural areas, or to females (etc.), is uncertain. In general, it is best to combine a longitudinal survey with overlapping cross-sectional surveys; to try to disentangle changes with age from changes in the time period. For example, when these youths were growing up there were a number of changes in legislation which affected conviction records. One of the effects of the Theft Act 1968 was to change the distribution of offenses between burglary and theft. Before the Theft Act, it was necessary to prove that a person had "broken in" to secure a conviction for breaking and entering. After the

legislation of this Act, it was merely necessary to prove that a person had "entered as a trespasser" to secure a conviction for burglary. This had the effect of classifying offenses as burglaries which would previously have been classified as thefts. Also, of course, there were changes in social habits while these youths were growing up. The enormous increase in reported drug use from age 14 to age 18 could be related to the period (1967–71) rather than to the increase in age.

It is easy to think of improvements to the present survey. It would have been better to have a nationally representative sample using the same self-report instrument at early intervals consisting additionally of questions about new behavior experienced during the previous year. It is not easy to carry out such an ideal survey. One problem is that questions which are applicable at one age are not necessarily applicable at another. In the present survey, one youth at age 24 said that he "hadn't done nothing like that for years," and another thought that these were "strange questions to ask people of my age." It is harder to describe changes in the quality of offending with age than changes in quantity. For example, the youth mentioned earlier who committed two robberies with guns at age 24, stealing more than $65,000, was also convicted of robbery at age 15. On this occasion, he threatened another youth of 15 with a stick and stole $2 from him. All these offenses were in the same legal category of "robbery," but the acts seem qualitatively different.

Finally, the real question of interest arising from this paper is why offending, in general, peaks around age 17. This is not true of all offenses, and it is interesting also to inquire whether committing earlier offenses (e.g. shoplifting) in some way leads to the commission of later ones (e.g. taking vehicles). However, most offenses peak around 17, and it is not difficult to think of possible reasons for this. The most obvious reasons center on peer group influence, life style, and opportunity. Around age 17, working class youths have left the influence of their families, spend time hanging around the streets with their male friends, and have not yet "settled down" with a female. The more delinquent youths at age 17 tended to have relatively well paid, dead-end jobs, and could afford to go out drinking with their friends most nights. However, they could not afford to satisfy their desire for excitement in socially approved ways. One youth at age 24 said that he gave up stealing cars once he got his own car. After age 21, the youths are less under the influence of their peers, more under the influence of a female and family life once again, and able to satisfy at least some of their desires in socially approved ways.

These ideas are only tentative, of course, and need systematic testing.

Other theories (e.g. stressing physical maturation, leaving school, etc.) are also possible. What is needed for the formulation of all theories is basic information about the development of delinquent and criminal behavior.

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4 GENETIC INFLUENCES IN CRIMINAL BEHAVIOR: EVIDENCE FROM AN ADOPTION COHORT

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Introduction

Human behavior patterns are generally ascribed to an interaction of life experiences and genetic predispositions, but the importance of genetic influences in shaping conduct has often been contested. This debate has been especially intense, and often emotional, in explaining criminal behavior (Sarbin, 1970)[1]. Refusal to consider genetic factors in crime has had political overtones (Haller, 1968). The controversy may also reflect the fact that, until recently, the evidence for genetic influences consisted mainly of twin studies, some of which were methodologically questionable.

Most recently Christiansen (1977) has reported on the criminality of a total population of 3,586 twin pairs from a well defined area of Denmark.[2] He found 52 percent of the twins concordant for criminal behavior for (male–male) identical twin pairs, and 22 percent concordance for (male–male) fraternal twin pairs. This result suggests that identical twins inherit some biological characteristic(s) which increases their common risk of being registered for criminal behavior.

It has been pointed out, however, that identical twins are treated more alike than are fraternal twins (Christiansen, 1977). Thus, their greater

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similarity in criminal behavior may be partly related to their shared experience. This has produced hesitation in the full acceptance of the genetic implications of twin research. The study of adoptions better separates environmental and genetic effects; if criminal adoptees have dispropor-tionately high numbers of criminal biological fathers (given appropriate controls), this would suggest a genetic factor in criminal behavior. This conclusion is especially supported by the fact that almost none of the adoptees know their biological parents;[3] the adoptee often does not even realize he has been adopted.

Two U.S. adoption studies have reported highly suggestive results. Crowe (1975) finds an increased rate of criminality in 42 Iowan adoptees with criminal biological mothers. Cadoret (1978) reports on 246 Iowans adopted at birth. Reports of antisocial behavior in these 246 adoptees are significantly related to antisocial behavior in the biological parents. In a study of Swedish adoptees Bohman (1978) originally found no significant relationship between criminality in the biological parents and in the adoptees; further analysis distinguishing between biological parents' levels of severity of criminality yielded evidence of a genetic relationship.[4] The present study is based on a register of all 14,427 non-familial adoptions in Denmark in the years 1924–1947. This register was established at the Psykologisk Institut in Copenhagen by a group of American and Danish investigators (Kety, Rosenthal, Wender, and Schulsinger, 1968). The register includes infor-mation on the adoptee and his/her adoptive and biological parents. We hypothesized that registered criminality in the biological parents would be associated with an increased risk of registered criminal behavior in the adoptees.

Method

Information on all nonfamilial adoptions in the Kingdom of Denmark between 1924 and 1947 (N = 14,427) were obtained from records at the Ministry of Justice. The distribution of adoptions by sex of adoptee for 5-year periods appears in table 4–1. Note the increase in adoptions with increasing population, especially during the war years, and the larger number of females adopted.

Criminality Data

Court convictions were utilized as an index of criminal involvement. Minors (below 15 years of age) cannot receive court convictions. Court conviction

Table 4–1. Number of Adoptions in Five Year Periods

Years	Male	Female	Totals
1924–1928	578	1051	1629
1929–1933	730	1056	1786
1934–1938	832	1092	1924
1939–1943	1650	1731	3381
1944–1947 (4 years)	2890	2782	5672
Year uncertain	20	15	35
Totals	6700	7727	14427

information is maintained by the chief of the police district in which an individual is born. The court record (Strafferegister) contains information on the date of the conviction, the paragraphs of the law violated, and the sanction. To access these records it is necessary to know the place of birth. When subjects' conviction records could not be checked it was usually because of lack of information or ambiguity regarding their date and/or place of birth. The court record was obtained for all of the subjects for whom date and place of birth were available (N = 65,516).

Information was first recorded from the adoption files of the Ministry of Justice. In these adoption files, birth place was then available for the biological and adoptive parents but not for the adoptee; birthplace for the adoptees was obtained from the Central Persons Register or the local Population Registers. The Central Persons Register was established in 1968; adoptees who died or emigrated before 1968 were thus excluded from the study. There were some difficulties in these searches. The criminal records of persons who have died or have reached the age of 80 are sometimes removed from the registers and archived in the Central Police Office in Copenhagen. Thus, if an individual had a court conviction but had died before our search began, his record might have been transferred from the local police district to the Copenhagen Central Police Office. There the record would be maintained in a death register. In view of this the entire population (adoptees and parents) were checked in the death register. If an adoptee had died or emigrated before the age of 30, the adoptee and parents were dropped from the study since he had not gone through his entire risk period for criminal conviction. A small section of Denmark in southern Jutland belonged to Germany until 1920. If an individual from this area was registered for

criminality before 1920 but not after 1920, his record was lost to this study.

For each individual we coded the following information; sex, date of birth, address, occupation, place of birth, and size of the community into which the child was adopted. The subjects' occupations permitted us to code socio-economic status (Svalastoga, 1959). For the adoptees we also coded marital status in 1976.

Not Fully Identified Cases

It will be recalled that in order to check the court register it was necessary to have name, date, and place of birth. A considerable number of cases were lost to this investigation for the following reasons: 1) Lack of record of place and/or date of birth. 2) In Denmark the biological mother is required by law to name the biological father. In some few cases she refused, was unsure or named more than one possible father. These cases were dropped from the population. 3) For 397 of the adoptive parents, the child was adopted by a single woman. This was due either to the adoptive father's death just before the formal adoption or to adoption by a single woman (not common in this era). 4) Because of extra difficulties involved in checking the criminal registers before 1910, individuals who were born before 1 January 1895 were excluded from the study.

In the case of exclusion of an adoptee for any of the above reasons the entire adoptive family was dropped. If a parent was excluded, the remaining subjects were retained for analysis. Table 4–2 presents the number of fully identified individuals in each of the subject categories.

Results

The data to be reported will consist of convictions for violation of the Danish Criminal Code (Straffeloven). The levels of court convictions for each of the members of the adoption family is given in table 4–2. The biological fathers and the male adoptee conviction rates are considerably higher than the rates for the adoptive father. The adoptive father is a bit below the rate (8%) for men of this age group, in this time period (Hurwitz and Christiansen, 1971). Note also that most of the adoptive father criminality is attributable to one-time offenders. The male adoptees and the biological fathers are more heavily recidivistic.

The rates of conviction for the women are considerably lower and there is

Table 4-2. Conviction Rates of Completely Identified Members of the Adoptee Families

Member	Number Identified	Number not Identified	Number of Criminal Law Court Convictions			
			None	One	Two	More than Two
Male adoptees	6129	571	.841	.088	.029	.040
Female adoptees	7065	662	.972	.020	.005	.003
Adoptive fathers	13918	509	.938	.046	.008	.008
Adoptive mothers	14267	160	.981	.015	.002	.002
Biological fathers	10604	3823	.714	.129	.056	.102
Biological mothers	12300	2127	.911	.064	.012	.013

considerably less recidivism. The biological mothers and female adoptees evidence higher levels of court convictions than the adoptive mothers. The adoptive mothers are just below the population average for women of this age range and time period, 2.2% (Wolf, 1962). The individuals who gave up their children for adoption, and their biological offspring, evidence higher rates of court convictions than the general population and the adoptive parents.

In light of current adoption practices one might be surprised that adoptive parents with court convictions were permitted to adopt. It should be recalled, however, that many of these adoptions took place during the Great Depression and the World War II years. It was more difficult to find willing adoptive homes in these periods owing partly to the relative unavailability of adoptive parents and to the additional numbers of adoptees available. Adoptive parents were accepted if they had a 5-year crime-free period before the adoption.

In most of the analyses which follow, we will consider the relationship between parents' criminal convictions in the adoptees. If either mother or father (biological and/or adoptive) has received a criminal law conviction, the parents for that adoptee will be considered criminal. In view of the low level of convictions among the female adoptees, analyses will concentrate on the criminal behavior of the male adoptees.

Types of Crimes

Of the adoptive parents, 5.5% were convicted for property crimes; 1.05% committed violent acts; 0.54% were convicted for sexual offenses. For the biological parents, 28.12% are responsible for property crimes; 6.51% committed violent crimes; 3.81% committed sexual offenses. Individuals could be registered for more than one type of crime.

Cross-Fostering Analysis

Because of the size of the population it is possible to segregate subgroups of adoptees who have combinations of criminal and non-criminal biological and adoptive parents. Table 4–3 presents the four groups in a design which is analogous to the cross-fostering paradigm used in behavior genetics. As can be seen in the lower right hand cell, if neither the biological nor adoptive parents are criminal, 13.5% of their sons are criminal. If the adoptive parents are criminal and the biological parents are not criminal this figure rises to

only 14.7%. Note that 20.0% of the sons are criminal if the adoptive parents are not criminal and the biological parents are criminal. If both the biological and adoptive parents are criminal we observe the highest level of criminality in the sons, 24.5%. The comparison analogous to the cross-fostering paradigm favors a partial genetic etiology assumption. We must caution, however, that simply knowing that an adoptive parent has been convicted of a crime does not tell us how criminogenic the adoptee's environment has been.[5] On the other hand, at conception, the genetic influence of the biological father is already complete. Thus this analysis does not yield a fair comparison between environmental and genetic influences included in the table. But this initial analysis does indicate that sons with a criminal, biological parent have an elevated probability of becoming criminal. This suggests that some biological characteristic is transmitted from the criminal biological parent which increases the son's risk of obtaining a court conviction for a criminal law offense.

A log-linear analysis of the data in table 4–3 is presented in table 4–4. Adoptive parent criminality is not associated with a significant increment in the son's criminality. The effect of the biological parents' criminality is marked. Study of the model presented in table 4–4 reveals that considering only the additive effect of the biological parent and the adoptive parent, the improvement in the chi square leaves almost no room for improvement by an interaction effect.

The adoptive parents have a low frequency of court convictions. In order to simplify interpretation of the relationships reported below we will exclude cases with adoptive parent criminality.[6]

Figure 4–1 presents the relationship between criminality in the sons and degree of recidivism in the biological parent. The relationship is positive and

Table 4–3. "Cross-Fostering" Analysis: Percent of Adoptive Sons Who Have Been Convicted of Criminal Law Offenses

	Are Biological Parents Criminal?	
	Yes	No
Are Adoptive Parents Criminal?		
Yes	24.5% (of 143)	14.7% (of 204)
No	20.0% (of 1226)	13.5% (of 2492)

Note: The numbers in parentheses are the total Ns for each cell.

Table 4–4. Log Linear Analysis: The Influence of Adoptive Parent and Biological Parent Criminality upon Male Adoptee Criminality

Model	Model Chi-Square	df	p	Improvement Chi-Square	df	p
Baseline (S,AB)	32.91	3	.001			
Adoptive Parent (SA,AB)	30.71	2	.001	2.20	1	n.s.
Biological Parent (SB, AB)	1.76	2	.415	31.15	1	.001
Combined Influence (SB,SA,AB)	0.30	1	.585	32.61	2	.001
Biological Parent given Adoptive Parent (SB/SA,AB)				30.41	1	.001
Adoptive Parent given Biological Parent (SA/SB,AB)				1.46	1	n.s.

Note: S means adoptee son effect: A means adoptive parent effect; B means biological parent effect.

relatively monotonic (with the scales utilized on the X and Y axes). Note also in figure 4–2 that the relationship mainly affects property crime in the adoptee. Log-linear analyses reveal that the relationship is highly significant for property crimes and not statistically significant for violent crimes.

The Chronic Offender

The chronic offender is infrequent but commits a markedly disproportionate number of criminal offenses. This extremely high rate of offending suggested the hypothesis that perhaps genetic predisposition may play an important role in these cases. We examined the relationship between the criminal behavior of the chronic adoptee offender and his biological parents.

In an important U.S. birth cohort study (Wolfgang, 1972), the chronic offender was defined as one who had been arrested five or more times; these chronic offenders comprised 6% of the males and had committed 52% of the offenses. In our adoption cohort we have recorded court convictions rather than arrest data. If we select as chronic offenders those with three or more court convictions this includes 4.09% of the male adoptees. This small group
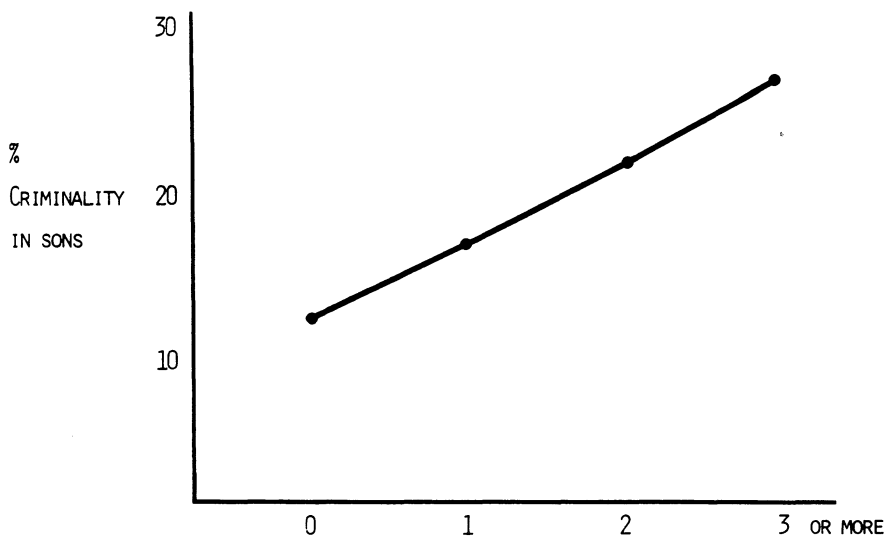
Figure 4-1. Adoptive Male Criminality by Biological Parent Criminality Based on Criminal Law Convictions (Cases in which Adoptive Parents are Non-Criminal)

of recidivists accounts for 69.4% of all the court convictions for all the male adoptees. This is a high concentration of crime in a very small fraction of the cohort.

Table 4-5 shows how the chronic offender, the other offenders (one or two convictions) and the non-offenders are distributed as a function of level of crime in the biological parents. As can be seen, the proportion of chronic adoptee offenders increases as a function of level of recidivism in the biological parents.

Another way of expressing this concentration of crime is to point out that the chronic male adoptee offenders with biological parents having three or more offenses, number only 37. They comprise one percent of the 3,718 male adoptees in table 4-5; they are responsible, however, for 30% of the male adoptee convictions. We should also note that the mean number of convictions for the chronic adoptee offenders increases sharply as a function of biological parent recidivism. The biological parents with 0, 1, 2, or 3 or more convictions have male adoptees averaging 30, 41, 48, and 70 convictions per 100 individuals, respectively.

We have presented evidence that there is an association between
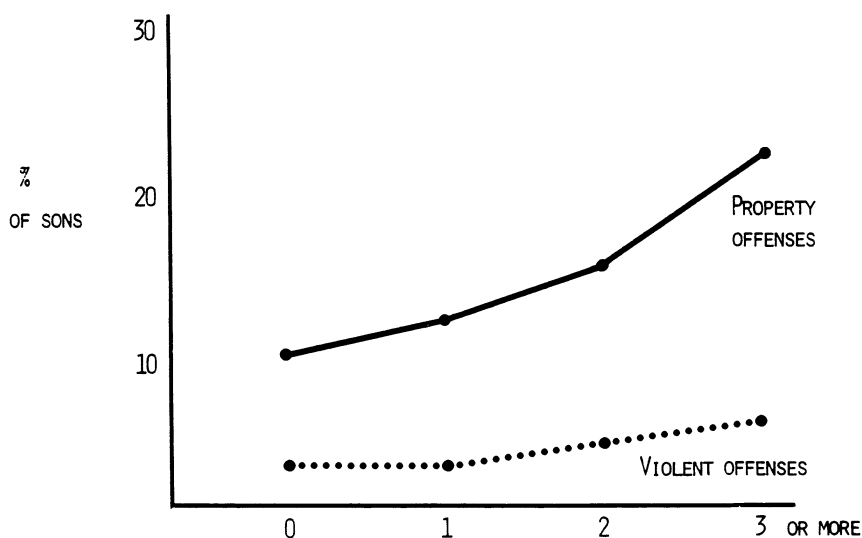
Figure 4-2. % Male Adoptee Property Offenders and Violent Offenders by Biological Parent Criminality Based on Criminal Law Convictions (Cases in Which Adoptive Parents are Noncriminal)

biological parents' criminality and the criminality of their adopted sons. The relationship seems stronger for chronic offenders. The sons of chronic offenders account for a disproportionate amount of the conviction in the cohort.

There are a number of instances in which a biological mother and/or a biological father contributed more than one of their children to this population. These offspring are, of course, full and half-siblings; they were sometimes placed in different adoptive homes. We would predict that the separated full siblings should show more concordance for criminal convictions than the separated half-siblings. Both of these groups should show more concordance than two randomly selected, unrelated, separately-reared male adoptees.

The probability of any one male adoptee being convicted is .159, the probability of any two unrelated, separated male adoptees being concordant for having at least one conviction is .025 (.159 times .159). There were 126 male-male half-sibling pairs placed in separate adoptive homes. Of these, 31 pairs had at least one member of the sibship convicted; of these 31 pairs four pairs were concordant for convictions. This yields a concordance rate for half-siblings of 12.9%. There were 40 male-male full sibling pairs placed in

Table 4–5. Proportion of Chronic Offenders, Other Offenders and Non-offenders in Male Adoptees as a Function of Level of Crime in the Biological Parents

	Number of Biological Parent Convictions				
Number of	0	1	2	3	or more
Male Adoptee Convictions					
Non-offenders (no convictions)	.87	.84	.80	.75	
Other offenders (1 or 2 convictions)	.10	.12	.15	.17	
Chronic offenders (3 or more convictions)	.03	.04	.05	.09	
Number of adoptees	2492	574	233	419	

Note: Table excludes cases in which adoptive parents have been convicted of criminal law violation.

different adoptive homes. Of these, 15 pairs had at least one member of the sibship convicted; of these 15 pairs three pairs were concordant for convictions. This yields a concordance rate for full siblings of 20%. These numbers are very small but the results are in the predicted direction. As the degree of genetic relationship increases, the level of concordance increases.

We also considered the level of concordance of the siblings pairs whose biological father was a criminal. (He had at least one conviction.) Of 98 fathers with at least one pair of male-male, separated, adopted siblings, 45 had received at least one conviction.[7]

Combining full-and-half-sibling pairs (because of the small numbers and because the siblings shared criminal, biological fathers), we constructed a contingency table (table 4–6). Of the 45 sibling pairs, 13 have at least one member with a conviction; of these 13, four pairs were concordant for convictions. This yields a concordance rate of 30.8%.[8]

While these numbers are very small, they represent all of the cases, as defined, in a total cohort of adoptions. The results suggest that a number of these separated, adopted siblings inherited some characteristic which predisposed them both to criminal behavior. As would be expected, in those instances in which the biological father is criminal, the effect is enhanced.

Specificity of Genetic Relationship

Above, we mentioned a study of a small sample of adoptees (Crowe, 1975). Crowe reports the impression that there was some similarity in the types of

Table 4–6. Concordance for Conviction in Male–Male Separately Adopted Sibling Pairs with Criminal Biological Fathers (Full Siblings and Paternal Half Siblings)

	Younger Siblings	
Older Siblings	Not Convicted	Convicted
Not Convicted	32	3
Convicted	6	4

Note: Maternal half siblings are not included since paternal crime was the selection variable.

crimes of the biological mother and adoptees. This suggests specific genetic predispositions for different types of crimes. In order to explore this possibility, we examined the rates of violent crimes in the adoptees as a function of violent crime in the biological parents. We completed similar analyses for property crimes. We also examined more specific types of crimes (theft, fraud, assault etc . . .) for similarity in the biological parent and the adoptee.

   If the genetic predisposition was specific for type of crime these "specificity" analyses should have resulted in our observing a closer relationship between adoptee and biological parent levels of conviction for each of these types of crime. The best predictor of each type of adoptee crime, however, was number of biological parent convictions rather than type of biological parent crime. This suggests that the biological predisposition which the adoptee inherits must be of a general nature helping to determine degree of law abidance. It is also possible that the data of this study are too gross to detect a specificity relationship. This may require careful coding of details of the criminal behavior. This was not possible in this study.

Sex Differences

As may be seen in table 4–2, convictions of females for criminal law violations are very infrequent. It may be speculated that those women who do exhibit a level of criminal behavior which prompts a court conviction must have an especially severe predisposition for such behavior. Criminal involvement in many men, on the other hand, may tend to be more socially or environmentally inspired. These statements suggest the hypothesis that criminal behavior in the biological mother will be better related to the

adoptees' convictions than criminal behavior in the biological father.

In every analysis we conducted, the relationship between biological mother crime and adoptee crime is significantly stronger than the relationship between biological father criminal behavior and adoptee criminal behavior. In comparison to the biological fathers, crime in the biological mothers is more closely related to crime in the daughters. This result is statistically significant but the relatively low frequency of female criminality causes us to interpret these findings with caution.

Historical Period

The period of these adoptions (1924–1947) spans some rather important historical and political changes in Denmark. These changes include a world war, the Great Depression and industrialization. It is conceivable that the influence of genetic factors might be affected by these social upheavals. It is also possible that changes in level or type of crime across these years might influence the relationships observed. Analyses conducted for the entire population were repeated for each of the 5-year periods. The results were virtually identical for all of the periods and virtually identical to the analyses of the total sample. The social changes across these years did not interact with the relationships between biological parent and adoptee crime.

Methodological Issues

Subjects not fully identified. If we are to generalize from the results of this study it is useful to consider what biases may be introduced by loss of subjects in specific analyses. Table 4–2 indicates the total number of subjects who could not be fully identified (name, birthday and birthplace). We should note that for most cases which were not fully identified we know the name, occupation, birthdate and other facts concerning the lost subject; in almost all cases a subject could not be checked in the court conviction register because we were not certain of the subject's place of birth. Another item often lacking was date of birth.

The information is relatively complete for the adoptive parents. On the other hand, 26.5% of the biological fathers and 14.7% of the biological mothers are not fully identified. These differences probably reflect the relative importance of the adoptive and biological parents to the adoption agency. The agency's chief concern was with the placement and welfare of

the adoptee. After the adoption, they had less reason to be concerned with the biological parents.

The most general characteristic of those not fully identified is that they tend slightly to come from areas outside of Copenhagen. Perhaps the urban adoption offices were more thorough in their recording procedures. The differences are very small. The sons of the biological fathers not fully identified evidence a rate of 10.3% criminal law convictions; the identified biological fathers' sons have criminal law convictions in 11.4% of the cases. In cases in which the biological mother is not fully identified, slightly fewer of the sons evidence criminal law convictions (9.6%). The adoptees who were not fully identified have biological mothers and biological fathers with slightly higher SES than those who were fully identified. Their rearing (adoptive) homes were of almost identical SES.

Our consideration of the characteristics of those not fully identified does not suggest that their inclusion would have altered the nature of the results presented above. Perhaps the most critical facts in this judgment are that the adopted-away sons of parents not fully identified, have levels of criminal law convictions and rearing social status which are approximately the same as for the sons of those parents fully identified. The differences which are observed are small; it is difficult to formulate any manner in which the lost subjects might have an impact on the relationships reported.

Transfer history.   Most of these adoptions were the results of pregnancies of unwed women. The adoptive agency had a policy of removing the newborn from the biological mother and either immediately placing it in a previously arranged adoptive home (25.3% of the adoptions) or placing the infants in orphanages from which they were available for adoption. Of those placed in orphanages, 50.6% were placed with an adoptive family in the first year; 12.8% were placed with an adoptive family in the second year of life and 11.3% were placed after the age of two.

Within each of these age-of-transfer groups, analyses were conducted to see whether the biological parents' criminality was related to male adoptee criminality. Similar significant positive relationships were observed at each transfer age. Age of transfer did not interact with genetic influence so as to alter significantly the relationships observed with the full population.[9]

The operational definition of criminal behavior in this study included only court convictions for criminal law offenses.[10] Use of this definition has some advantages. We are relatively certain the individual actually committed the offense recorded. Court convictions imply a high threshold for inclusion; minor offenses are less likely to result in court conviction. There are also disadvantages. The subject's behavior goes through several screening points.

Someone must make a complaint to the police or the police must happen on the scene of the crime. The police must decide a crime has been committed and apprehend the culprit. The prosecuting attorney must decide that the evidence is sufficient to warrant a court trial. The court must then find the culprit guilty. There are decision points all along the way which may act to exclude individuals who have actually committed offenses against the criminal code. Such individuals might then end up among our control subjects (assuming they do not also commit offenses for which they are convicted). In this case they add error to the analyses. Data comparing self-reports of crimes and official records of crimes suggest, however, that while only a fraction of crimes committed by an individual are noted by the police, those who "self-report" more crimes have more crimes recorded in the official registers. Those offenders who are not found in the official registers have typically committed very few and very minor offenses (Christie, Andenaes, and Skerbaekk, 1965).

Labelling of the adoptee.   The advantage of the adoption method is the good separation of genetic and rearing contributions to the adoptee's development. But the adoptions were not arranged as controlled experiments. The adoption agency's prime concern was the welfare of the adoptee and his adoptive parents. Prospective adoptive parents were routinely informed about criminal convictions in the biological parents. This could result in the labelling of the adoptee; this in turn might affect the likelihood that the adoptee would commit criminal acts. Thus, the criminality of the biological parents might conceivably have had an environmental impact on the adoptee via the reactions of the adoptive parents.

   We examined one hypothesis which explored this possibility. If the biological parents suffered a criminal conviction before the adoption it is likely that the adoptive parents were so informed; if the biological parents' first conviction occurred after the adoption, the adoptive parents could not have been informed. Of the convicted biological parents, 37% had their first conviction before the adoption took place. In these cases, the adoptive parents were likely to be informed regarding this criminal record. In 63% of the cases the first conviction occurred after the adoption; in these cases the criminality information could not have been transmitted to the adoptive parents. For all the criminal biological parents, the probability of a conviction in their adopted son is 15.9%. In cases in which the biological parent was first convicted before adoption 15.6% of the male adoptees became criminal. In the cases in which the biological parent first became criminal after the adoption 16.1% of the male adoptees became criminal. In the cases in which the biological parent first became criminal after the

adoption 16.1% of the male adoptees became criminal. In the case of the female adoptees these figures are 4% and 4%. This analysis utilized convictions. In a previous analysis with a large sub-sample of this population, a very similar result was obtained by studying the effect of timing of the initial arrest of the biological father (Hutchings and Mednick, 1977). Additional analyses by type or severity of crime could detect no effect of the adoptive parents being informed of the criminality of the biological parents. The fact that the adoptive parents were informed regarding the biological parents' crime did not alter the likelihood that the adoptive son would become criminal. This result should not be interpreted as suggesting that labelling (as defined) had no effect on the adoptees' lives. It did not, however, affect the the probability of the adoptee experiencing a conviction for a criminal act.

Denmark as a research site.   This project has been completed in Denmark. On most crime-related social dimensions, Denmark must rank among the most homogenous of the Western nations. This fact may have implications for the interpretation of this study. An environment with low variability permits better expression of existing genetic tendencies in individuals living in that environment. This factor probably magnifies the expression of any genetic influence. At the same time, however, the Danish population probably has less genetic variability than some Western nations; this, of course, would serve to minimize the expression of genetic influence in research conducted in Denmark. It is very likely impossible to balance these two considerations quantitatively. We are reassured regarding the generality of our findings by similar results in adoption studies in Sweden and Iowa (Crowe, 1975; Cadoret, 1978; Bohman, 1978).[4]

Summary and Conclusions

In a total population of adoptions we have noted a relationship between biological parent criminal convictions and criminal convictions in their adoptive children. The relationship is particularly strong for chronic adoptee and biological parent offenders. No evidence was found that indicated that type of biological parent crime was related to type of adoptee crime. A number of potentially confounding variables were considered; none of these proved sufficient to explain the genetic relationship. We conclude that some factor is transmitted by criminal parents which increases the likelihood that their children will engage in criminal behavior. This is especially true for chronic criminality. Since the factor transmitted must be biological this

implies that biological factors are involved in the etiology of at least some criminal behavior.

Biological factors and their interaction with social variables may make useful contributions to our understanding of the causes of criminal behavior.[11]

Notes

1. Sarbin, T.R. and J.E. Miller. 1970. *Issues in Criminology.* 5:195. Reference to research on the XYY chromosome anomaly as "Demonism Revisited."

2. Christiansen, K.O. 1977a. In: S.A. Mednick and K.O. Christiansen (Eds.) *Biosocial Bases of Criminal Behavior.* New York: Gardner Press. p. 45. The concordance rates reported are proband-wise.

3. Teasdale, T.W. and T. Sørensen. The Copenhagen Adoption Register. A note concerning adoptees' knowledge of their biological parents; prepared paper.

4. Bohman, M. Personal communication.

5. Recall the preponderance of one-time offenders in the adoptive parents and the adoption agency's condition that the adoptive parents may not have a conviction for the five years preceding the adoption.

6. Analyses completed which did not include adoptive parent criminality did not alter the nature of the finding to be reported.

7. It should be noted that this is a significantly higher rate of convictions (45.9%) than the conviction rate for the total population (28.6%) of biological fathers (x^2 (1) = 14.6, p < .01).

8. These pairwise concordance rates may be compared with the male-male rates for twins from a population twin study; Christiansen (1977) reports 36% pairwise concordance for identical twins and a 13% rate for fraternal twins. (For comparison, it is important to note that the male-male twins have a conviction rate of 12.3%; the male adoptees have a conviction rate of 15.9%.)

9. It should be noted that there was a statistically significant tendency for high levels of adoptee criminality to be associated with more time spent in the orphanage waiting for adoption. This effect was true for males but not for females.

10. We completed an analysis of police arrest data using a subsample of this adoption cohort and obtained highly similar results.

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5 SOCIAL CLASS AND CRIME: GENETICS AND ENVIRONMENT

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Introduction

It is, by now, trite to say that most theories of crime and delinquency are based on the notion that crime is found primarily in the lower classes. Because the crime–class relationship is so central to crime and delinquency theory it has been the focus of much sociological research in the field. This is especially so since the 1960s when the rising popularity of the self–report method of measuring delinquency called the basic relation between social class and delinquency into question (Short and Nye, 1958; Reiss and Rhodes, 1961; Dentler and Monroe, 1961; Clark and Wenninger, 1962; Slocum and Stone, 1963; Akers, 1964; Elmhorn, 1965; Christie, Andenaes and Skaerbekk, 1965; Gold, 1966; Empey and Erikson, 1966; Hirschi, 1969). A more recent study by Tittle, Villemez and Smith (1978) reviews

selected literature concluding that there is not now nor perhaps has there ever been a relation between class and delinquency.

The Tittle et al. article, together with rebuttals to it (Clelland and Carter, 1980; Braithwaite, 1981) has revived the debate. The present research adds a new dimension. It notes a class/criminality relationship and suggests assignment of portions of the relationship to both environmental and genetic factors. We are unaware of any previous attempt to separate, empirically, the environmental and hereditary social class influences which might affect the probability of criminal behavior.

Recent evidence has accumulated which suggests that biological charac-teristics, which increase the probability of criminal behavior, can be genetically transmitted. In family studies a parent's criminal involvement is a good predictor of a child's criminal involvement (West and Farrington, 1977). Identical twins are more concordant for criminal behavior than fraternal twins (Christiansen, 1977). A child who is adopted at or near birth and has no contact with his biological father has a higher likelihood of exhibiting criminal behavior if his biological father is or was criminal (see Mednick and Volavka, 1980). The implications of this evidence here led us to the present study.

Method

The Present Study

The purpose of this study is to test the hypothesis that there is both a hereditary and an environmental component to the relationship of social class and criminality. This analysis is possible because of the availability of data on a population of adoptees in Denmark. Registered criminal behavior has been ascertained for the adoptees and their biological and adoptive parents. Social class–related hereditary influences (from biological parents) can be separated from social class–related environmental influences (from adoptive parents and their independent relationships to crime observed).

The Population

One of the major problems with using official data for criminality is the lack of variability in the number and type of arrests or convictions when using a general population. Not enough serious offenses are committed by the

general population to support analyses using such offenses. The problem is usually solved by taking a nonrepresentative sample of the population and focusing on officially noted offenders, thus eliminating a very large portion of the offending and nonoffending populations. A methodologically superior, but usually prohibitively expensive solution is to take a sample large enough so that there will be sufficient variability in criminal or delinquent behavior to support valid analyses. The current study uses an entire, large, adoption cohort, mitigating the sampling problems considerably.

One of the major difficulties of studies using self–reported crime or delinquency data is the incompleteness of the samples. That is, the self-report method usually misses the lowest classes, the most truant, the dropouts—i.e., the most delinquent. Again, the use of an entire cohort reduces this problem.

The current data set is based on all nonfamilial adoptions that took place between 1924 and 1947 in the Kingdom of Denmark. By nonfamilial, we mean adoptions by persons not biologically related to the child. There were 14,427 such adoptions during that period; 6,700 involving male children and 7,727 involving female children.

Criminality Ascertainment

Court conviction records were obtained for the adoptees' biological parents and adoptive parents from the office of the police chief in the region in which the subject was born. The criminal records in Denmark have been described as "probably the most thorough, comprehensive and accurate in the Western world" (Wolfgang, 1977). In order to access this Conviction Register (CR) it was necessary to know the place and date of birth as well as the name of the subject. Some subjects (mainly biological fathers) were lost to this part of the study because of missing information regarding birth place. Almost all adoptive parents, biological mothers and adoptees were fully identified. The search of the conviction records was completed between 1976 and 1978 when the adoptees were between 28 and 52 years of age. Note that the completeness of the population allows the full range of criminality to be included in the analysis.

Social Class Measures

The adequacy of social class measures used in class and crime literature has usually been less than optimal. Often the indicators are children's reports of

their parents' occupations (Short & Nye, 1958; Hirschi, 1969), or the application of aggregate income levels to individuals within neighborhoods (Wolfgang et al., 1972).

· Social class status in this study was rated individually from occupational title by a method adapted from one devised by Svalastoga (1959). This measure, based on prestige ratings, was demonstrated by Svalastoga to yield an excellent indicant of social status in this nation. The scale, as adapted, ranges from 0–7. Some examples of occupational titles associated with each class level are given in table 5–1. For purposes of data analysis, the 7-point scale was divided into High, Middle and Low groups as shown in table 5–1.

Table 5–1. Examples of Occupational Titles Associated with Each of the Social Status Levels (From Svalastoga, 1959)

Class Level:	Examples:
Low	0. *Unskilled worker I:* shoeshiner, agricultural laborer, maid, low level factory worker.
Low	1. *Unskilled worker II:* truck or taxidriver (not owner of vehicle), waiter (small restaurant), small fisherman, janitor, door keeper.
Low	2. *Skilled worker:* not self-employed, carpenter, mailman, street car conductor, shop assistant.
Medium	3. *Subordinate clerk:* minor responsibility, clerk, proof-reader, salesman.
Medium	4. *Skilled craftsman:* (self-employed with 0–3 skilled employees) factory foreman, grocer, policeman, lower level customs official, baker, nursery school teacher, journalist.
Medium	5. *Owner of moderate-sized business—semi professional:* master-printer, bookkeeper, hotel proprietor, accountant, librarian, elementary school teacher.
High	6. *Professional—Manager in larger business:* wholesale merchant, postmaster, editor, school principal, department head in larger firm, minister, member of parliament, engineer, general practitioner physician.
High	7. *Big business director, supervising professional:* chief of police, colonel in army, physician with high standing, managing director, professor, shipowner.

Results

Table 5–2 presents the SES distribution for biological and adoptive parents. As might be expected, the adoptive parents (AP) are from a higher social class level than the biological parents (BP). The SES of the AP and BP correlate 0.14 (p < .001). This correlation is apparently due to the attempt of the adoption agency to match BP and AP.

Table 5–3 demonstrates the basic relationship between social class of

Table 5–2. SES Distribution of Biological and Adoptive Families

SES	Family	
	Biological	*Adoption*
High	2068	5230
	(16.6%)	(37.7%)
Middle	5202	4888
	(41.7%)	(35.2%)
Low	5206	3767
	(41.7%)	(27.1%)
	12,476	13,885
(100.0%)	(100.0%)	(100.0%)

Table 5–3. Percent Adopted Children with Criminal Convictions as a Function of Parents' SES by Sex of Adoptees

SES	Biological Parents		Adoptive Parents	
	Male Adoptees	*Female Adoptees*	*Male Adoptees*	*Female Adoptees*
High	11.64	0.99	11.58	2.01
	(971)	(1067)	(2099)	(2384)
Medium	14.31	2.56	15.62	2.43
	(2341)	(2691)	(1985)	(2264)
Low	16.00	2.95	17.19	3.19
	(2337)	(2691)	(1565)	(1726)

parents and adoptees' criminality. The relationship exists when considering SES of biological parents as well as SES of adoptive parents. It holds true for both male and female adoptees.

Of course, in all previous work in this area, the hereditary and environmental SES for the parents were identical, since the children were usually raised by their biological parents. In order to compare our findings with those of other studies we selected cases in which the adoptive and biological parents had the same social class. For this special group, we then examined the criminal conviction rates for adoptees by SES level of their parents. The table 5–4 indicates that under these conditions as well, the daughters' and sons' criminal conviction rates vary inversely with parental social class. To express this relationship in the form of a *gamma* (most commonly used in previous studies) the child's criminality was recoded as 0, 1, 2, 3, or more criminal offenses. For males the parental SES–Crime *gamma* was $-.19$ ($SE = .05$). For females the amount of criminality was too small to permit calculation of a reliable *gamma*.

Table 5–5 presents criminal conviction rates in the adoptive sons and daughters as a joint function of the BP and AP social classes. As noted in table 5–3 the marginal values reveal that conviction rates in the adoptive sons vary as a function of both biological and adoptive parents' class level. Note that at all three levels of adoptive parent SES, the biological parents' SES varies inversely with the adoptive sons' rate of criminal convictions. It is also true that at all the three levels of biological parent SES, the adoptive parents' SES varies inversely with the adoptive sons' rate of criminal convictions.

Table 5–4. Adoptee Conviction Rates by "Parental" SES (Including only cases for which biological parents' SES is the same as adoptive parents' SES)

		Percent adoptees with criminal convictions	
		Male Adoptees	*Female Adoptees*
	High	9.3	0.64
		(441)	(467)
"Parental" SES	Middle	15.29	1.84
		(870)	(980)
	Low	18.04	3.02
		(787)	(861)

Note: Numbers in parentheses reflect cell total N.

Table 5-5. Percent Adopted Children with Criminal Convictions as a Function of Adoptive and Biological Parents' SES

	Male Adoptees Biological Parents' SES				Female Adoptees Biological Parents' SES			
	High	*Middle*	*Low*	*Total*	*High*	*Middle*	*Low*	*Total*
Adoptive Parent SES								
High	9.30 (441)	11.52 (903)	12.98 (775)	11.58 (2099)	0.64 (467)	2.56 (1056)	2.09 (861)	2.01 (2384)
Middle	13.44 (320)	15.29 (870)	16.86 (795)	15.62 (1985)	0.61 (330)	1.84 (980)	3.67 (954)	2.43 (2264)
Low	13.81 (210)	17.25 (568)	18.04 (787)	17.19 (1565)	2.38 (210)	3.66 (655)	3.02 (861)	3.19 (1726)
Total	11.64 (971)	14.31 (2341)	16.00 (2337)	14.55 (5649)	0.99 (1067)	2.56 (2691)	2.95 (2676)	2.48 (6374)

Note: Tabled values are percent adoptees with criminal convictions. Numbers in parentheses are cell total Ns.

The Models

The data presented in table 5–5 constitute the core of the analyses in this study. While data on a population generally do not require inferential statistical treatment, in this case inferential analyses were completed to permit us to estimate the size of the effects and to determine the justifiability of generalizing to other adoption cohorts.

Our interest in this exposition is to establish or disconfirm relationships between rearing social class and adoptees' crime, and between the social class of biological parents and the crime of their separated offspring. Taking into account the relationship between rearing and biological social class, the most appropriate method of analysis for this problem, especially given the highly skewed distribution for the variable "crime" (reflecting presence or absence of criminal convictions), is a log–linear analysis. Such an analysis was undertaken using Fay and Goodman's ECTA program.

Our general strategy was to fit a succession of models to the observed cell frequencies, beginning with a baseline model to which all others were compared. The baseline model consisted of a fit of the marginals for biological and environmental (adoptive) social class (B and E respectively) jointly. In conventional notation this model can be represented by the following:

<div align="center">

[C]   [BE]   Baseline Model

</div>

This model generates expected cell frequencies based on the knowledge of the overall distribution of criminal convictions and on the joint distribution of the two sources of social class. Note that this model takes into account the relationship between biological and adoptive social class, but sets the relationships between social class and crime to 0. If there is no systematic relationship between social class (of both types) and crime, and if there is not substantial random fluctuation, the fit of this model would be very close to the observed data. In the event of an imperfect fit using the baseline model (i.e., a significant Chi Square), models adding environmental or adoptive social class, then biological social class and then both were fitted. These models are represented by the following:

<div align="center">

[EC]   [BE]   Environmental Social Class Model
[BC]   [BE]   Biological Social Class Model
[EC]   [BC]   [BE]   Complete additive model

</div>

In each case, one or more relationships between social class and criminal convictions are released from the assumption that they are 0, leaving them

free to improve the fit over the baseline model. Of course, the baseline marginals remain in each model.

The relative contribution to the model for which each addition can be created was then assessed by subtracting the new model's likelihood ratio chi square from the analogous baseline chi square, thus producing a Reduced L^2. Using the degrees of freedom lost by the addition of new marginals to the model, the change in chi square can be assessed by standard criteria of size and stability.

We will first consider the model for the adoptive sons (see table 5–6). The fit of the baseline model ([C][BE]) to the observed frequencies yielded a likelihood ratio chi square of 34.16 (8 df, p < .001). The model including the environment and crime marginals ([BE][EC]) improves the fit substantially. The chi square representing the environmental model is 8.15 (6 df, p = ns); the difference between the baseline model chi square and the environmental model chi square (reduced L^2) is 26.01 (2 df, p < .001). The model including biology and crime marginals ([BE][BC]) also improves the fit. The chi square representing the biology model is 23.15 (6 df, p < .001); the difference between the baseline model chi square and the biological model chi square is 11.01 (2 df, p < .01).

When the model includes both biological and environmental components the chi square is .33 (4 df, n.s.) indicating a very close fit with the observed

Table 5–6. Logit Analysis: Environmental and Biological Social Class Influence on Crime

Adopted Sons					
Direct L^2	df	Model	Reduced L^2	DF	Goodman's R^2
34.16***	8	Baseline [C][BE]			100.0
8.15	6	Environment [EC]	26.01***	2	74.0
23.15***	6	Biology [BC]	11.01**	2	34.2
0.33	4	Environment and Biology [BC][EC]	33.83***	4	99.1
		Biology given Environment [BC][EC]	7.82**	2	22.2
		Environment given Biology [EC][BC]	22.82**	2	73.0

*p < .05; **p < .01; ***p < .001.

frequencies. It is clear from this that there are no significant interaction effects.

Finally, we can calculate the chi square for the biological effect, given the environmental effect, by subtracting the chi square for the environmental model from the chi square of the full additive model; and similarly, the environmental effect, given the biological effect can be calculated. The results of these calculations can also be seen in table 5–6. In both cases the resulting chi square is significant; that is, the environment shows a significant effect given biology, and biology shows a significant effect given the environment.

These results indicate that the biological parents' social class and the adoptive parents' social class are significantly related to the adoptees' level of criminality. The relationship of the adoptive parents' social class to the adoptees' criminality is greater than that of the biological parents.

Table 5–5 also presents the adoptive daughters' criminal convictions as a joint function of BP and AP social class. First, it should be noted that they have lower levels of criminal activity than the adoptive sons. The marginal values indicate that conviction rates in the adoptive daughters vary as a function of both biological and adoptive parents' class level.

The models fitted for the adoptive sons were also applied to the adoptive daughters' criminality (See table 5–7). The fit of the baseline model ([C][BE]) to the observed frequencies yielded a likelihood ratio chi square of 27.67 (8 df, $p < .001$). The model including the joint environment and crime marginals ([BE][EC]) improves the fit. The chi square representing the environmental model is 22.08 (6 df, $p < .001$); the difference between the baseline model chi square and the environmental model chi square is 5.59 (2 df, n.s.).

The model including the joint biology and crime marginals ([BE][BC]) improves the fit substantially. The chi square representing the biological model equals 13.40 (6 df, $p < .05$). The difference between the baseline model chi square and the biological model chi square is 14.27 (2 df., $p < .001$).

When the model includes both biological and environmental components the chi square suggests a poorer fit in the absence of interaction terms compared to the fit of this model for adopted sons. However, interpretable interactions are not apparent, as can be seen by inspection of table 5–5.

The two analyses presented imply:

1)   The SES of rearing environment has a measureable impact on the criminality of adoptees.

2)   There is a biological factor associated with lower SES and with criminality that may be genetically transmitted.

Table 5-7. Logit Analysis: Environmental and Biological Social Class Influence on Crime

Adopted Daughters					
Direct L^2	df	Model	Reduced L^2	DF	Goodman's R^2
27.67***	8	Baseline [C][BE]			100.0
22.08***	6	Environment [EC]	5.59	2	20.2
13.40*	6	Biology [BC]	14.27**	2	51.6
9.25	4	Environment and Biology [BC][EC]	18.42**	4	66.6
		Biology given Environment [BC]/[EC]	12.83**	2	46.3
		Environment given Biology [EC]/[BC]	4.15	2	15.0

*p < .05; **p < .01; ***p < .005.

3) For males the environmental impact is larger than the biological, though both are substantial.
4) For females the biological factor is the more important.

Type of Crime

Similar analyses, based on data shown in tables 5–8 and 5–9 conducted for male adoptees with respect to more specific types of offenses (there were too few convicted daughters to allow such an analysis for females). The results for property offenses closely mirrored those reported for table 5–5. Both environmental and biological factors contribute significantly to the fit of this model, again, with the environment being a stronger influence than the biological. In addition, the combined model (using both biological and environmental factors), without interaction terms, produces an almost perfect fit with the observed frequencies.

For violent offenses (table 5–9), the fit of the baseline model is very close to the observed frequencies (chi square = 5.04, 3 df, p = .17), suggesting that neither the biological nor the environmental factors contribute significantly to the adopted sons' violent behavior. Because of the small number of violent offenders, the high and middle class groups were merged in table 5.9.

Table 5–8. Percent Adoptive Sons with Property Offense Convictions as a Function of Adoptive and Biological Parent SES

	Biological Parent SES			
	High	Middle	Low	Total
Adoptive Parent SES				
High	7.47	8.97	9.80	8.95
	(442)	(903)	(755)	(2100)
Middle	9.38	13.32	14.45	13.14
	(320)	(871)	(796)	(1987)
Low	11.43	14.26	15.23	14.37
	(210)	(568)	(788)	(1566)
Total	8.95	11.87	13.21	11.92
	(972)	(2342)	(2339)	(5653)

Note: Tabled values are percent adoptees with property offense convictions. Numbers in parentheses are cell total Ns.

Table 5–9. Percent of Adoptive Sons with Violent Offense Convictions as a Function of Adoptive and Biological Parent SES.

	Biological Parent SES		
	High + Middle	Low	Total
Adoptive Parent SES			
High + Middle	2.37	3.42	2.76
	(2536)	(1551)	(4087)
Low	3.47	3.05	3.26
	(778)	(788)	(1566)
Total	2.63	3.29	2.90
	(3314)	(2339)	(5653)

Note: Tabled values are percent of adoptees with violent offense convictions. Numbers in parentheses are cell total Ns.

Summary and Conclusions

We have found that registered criminal convictions are more prevalent in the lower classes. This replicates the results of many U.S. studies and of another population study from Denmark (Moffitt, Gabrielli, Mednick and Schulsinger, 1981). The Moffitt et al. study is important since it reports this relationship on a birth cohort of all men born in Copenhagen between 1944–1947 (N = 31, 434). The SES/crime relationship is not specific to adoptees. We should also mention that the relationship is continuous and not only due to a concentration of crime in the lowest class as suggested by Johnson (1979). In addition, the extent of the relationship (*gamma* = −.19) is at about the level of earlier reports from U.S. samples. In order to help interpret this *gamma* it should be noted that while there is a lower class in Denmark, the advanced social–welfare system has reduced the financial discrepancy between classes (at least as compared to the U.S.).

Several methodological issues may legitimately be raised in connection with these findings. For instance, the question of the generalizability of the findings to the U.S. from Danish data may be raised. Second, the issue of whether the effects that we refer to as genetic may be due to nongenetic biological factors that are related to social class is important. The biasing effects of system processing on our criterion variable of criminality might be raised as a possible confounding influence. Another potential problem is that environmental factors might have had an impact before the child was transfered to the adoptive parents. Finally, the question of whether or not the adoptive parents are informed of the criminality of the biological father is a potential problem. For purposes of this brief presentation, it is perhaps sufficient to indicate that when these factors are carefully evaluated empirically and in terms of the existing literature, they still do not account for the genetic effect of the biological parents' social class. Each of the potential confounding factors mentioned here is discussed in some detail in the more complete publication (Van Dusen, et al., 1983).

In summary, we may say that the results of this study indicate that social class is related negatively to criminal convictions. The hypothesis was tested and confirmed that social class has both genetic and experiential components which predispose to criminal involvement. On the experiential side it is known that lower SES status is associated with a variety of crime-associated characteristics such as less intellectual stimulation and lower educational attainment, greater disparity between opportunities and aspirations, and greater likelihood of criminal associations. On the genetic side, SES correlations with heritable biological factors that might predispose to crime are less well known. In this context we are examining autonomic nervous

system characteristics which may be heritable, as well as SES– and crime-related. Other candidates for consideration as mediating variables are biological factors related to intelligence and temperament.

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6 SCHOOL AND FAMILY ORIGINS OF DELINQUENCY: COMPARISONS BY SEX

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Introduction

Many longitudinal studies have found that antisocial behavior in childhood, broadly defined, is related to adolescent and adult antisocial behavior. Many of these studies have included only males, possibly because the rate of antisocial behavior is much higher among males, because males seem to have more continuity in aggressiveness from one time to the next, or because our society, including its scientists, associates antisocial behavior with males as if it is a male problem. We argue, as does Harris (1977), that the failure to include the antisocial behavior of both males and females is a major shortcoming of research thus far into delinquency and criminality. Indeed the differences in rates offer a major opportunity to investigate the conditions leading to delinquency, whether these be biological, social, psychological, or some combination.

This paper concerns early social adaptational and family antecedents of teenage delinquent behavior in a population of first graders whom we reassessed ten years later, when they were teenagers. These children comprise the total population of first graders in an urban, black ghetto community on the South Side of Chicago. We explore the paths, whether

different or similar, leading to delinquency for males and females in order to develop more complete explanations of delinquency. Our investigations will include aspects of their families, their social adaptation to school, and their psychological wellbeing.

Over the past seventeen years the Woodlawn studies have been based on a two-dimensional conception of mental health, psychological wellbeing and social adaptational status (see Kellam et al. 1975). Social adaptational status measures how a significant other—a natural rater—in a particular social field rates the individual's performance on the social tasks that the natural rater defines. Examples of natural raters in social fields are the parent in the child's home, the student's teacher in the classroom, other teenagers in the peer group, and the foreman on the job.

The concept of social adaptation is embedded in a lifespan developmental perspective. Each stage of life finds individuals in one, two, or a few main social fields, which increase and decrease in importance as life proceeds. The school, peer group, and the family are those social fields that are most important for teenagers in our society.

The concepts of social adaptational status and natural rater do not imply that the natural rater's observations are objective or correct. We maintain that the natural rater's judgments have a certain face validity because they have important ramifications—the teacher gives grades and passes or fails students; foremen or supervisors assess job performance, etc. (see Kellam et al. 1975; Kellam and Ensminger 1980). Chance, the fit of the individual in a specific group, the idiosyncracy of the natural rater, and the individual's own behavior may all influence social adaptational status.

SAS and Delinquency

Social adaptational status (SAS) has particular relevance to delinquency. SAS is a measure of the success or failure of the performance of an individual in a social field. In our framework teenage delinquency is a form of social adaptation, or maladaptation, defined by the often conflicting standards of several social fields, mainly the peer group, the school, the family, and the legal system. We examine the relationship of adaptation in the first grade classroom to later delinquency as part of our overall interest in the effect of early SAS on later SAS.

Our data thus far show that first grade SAS ratings are important antecedents of later drug, alcohol,, and cigarette use by males, but that only certain kinds of maladaptive males had an increased risk (Kellam et al. 1980). Males rated as aggressive (e.g., those who fight, break rules) or as

both shy and aggressive by their first grade teachers had a greater risk of later substance use, while males rated as only shy (e.g., those who sit alone, do not speak up) were the least likely to report substance use. Adapting males and nonshy, nonaggressive males with learning problems were in the middle.

While these antecedents held only for males, another set of early measures predicted use of drugs and alcohol for both males and females. These were the readiness-for-school and IQ test scores. Brighter performing students, male and female, used drugs and alcohol more frequently. These findings suggest that only certain kinds of early failure may increase risk of later delinquent behavior, and the sources may be different in some ways and similar in others for females and males.

The studies of Robins (1966) indicate that children who showed antisocial behavior early in elementary school were more likely to have contact as adults with the criminal justice system than either those who had no problems or those whose problems were other than antisocial ones. Other longitudinal studies have also found that early aggressiveness, variously defined and measured, relates to later delinquency (Conger and Miller 1966; Mitchell and Rosa 1981; Lefkowitz, Erons, Walder and Huesmann 1977; Farrington 1978). Only the Lefkowitz et al. study included females as well as males. They found that third grade peer-rated aggression related to peer-rated aggression one year after the normal time of high school graduation for both males and females. However, early aggression related to later self-reports of antisocial behavior only for the males.

Given our past results for substance use and the delinquency literature cited above we are particularly interested in whether first grade ratings of learning problems and/or aggressiveness relate to later delinquency in the same way for males and females.

Family and Delinquency

The importance of the family in delinquency theory and research has varied over the years. Since the 1950s there has been renewed interest in the impact of family structure. The effect of the actual family relationships and childrearing atmosphere on delinquency has received increasing attention. The family's economic resources may also affect the child's delinquency. In this paper we examine the impact of family structure, and family economic resources on teenage delinquency. We focus on a central aspect of family structure—the variation in combinations of adults in the childrearing families.

A very entrenched belief within the delinquency field is that children from

"broken" homes are more likely to be delinquent than children from "intact" homes. However, the evidence that children from "broken" homes show greater delinquency is equivocal. Studies using official reports of delinquency often show children from nonintact homes to be referred more often to the juvenile justice system (Weeks and Smith 1939; West and Farrington 1973; Thomas and Cage 1977; Chilton and Markle 1972). This may be explained by the tendency of juvenile justice personnel to consider that a youth from a one parent family is in need of greater control; thus such youths are more likely to be referred to the police or courts. Other researchers have reported no such differences in self-reported delinquency (Nye 1958; Dentler & Monroe 1961; Hirschi 1969; Hennessy, Richards, & Berk 1978). Both Hirschi (1969) and Gold (1970) found the greatest delinquency in families with stepfathers.

Previous findings in the Woodlawn studies suggest that a greater specification of kinds of combinations of adults might well enlighten research on family structure and delinquency (Kellam, Ensminger, & Turner 1977). We examined family types at the time of first grade in two separate cohorts— one of which comprises the study population in this paper—by classifying the various combinations of adults at home on the basis of their relationship to the study child. For example, mother alone households were those in which mother was the only adult; mother/father or mother/grandmother occurred with or without others. There were 86 different combinations of adults in the 1966–67 cohort and 79 in the 1964–65 cohort. These findings illustrate the great diversity in the households of the first grade children in this community, and probably in others.

We found family type to be strongly related to the child's social adaptational status (SAS) in school, i.e., how adequate the child was judged by the teacher in performing classroom tasks. The results showed that the classification of families as "broken vs. intact" or "father present vs. father absent" was too simplistic. For both cohorts of first graders, mother alone families entailed the highest risk to SAS, but the presence of certain second adults was more effective than that of others. Mother/father families and mother/grandmother families were more effective than mother/stepfather families. In terms of risk in first to third grades the absence of the father was less important than the aloneness of the mother.

Since our data are prospective and longitudinal, we can examine whether the impact of family composition on delinquency varies according to the length of time the child has lived in a particular family type. We will examine not only whether different family types in first grade and ten years later have different risks of delinquency, but also whether the change or stability of the family type matters.

The Woodlawn Community Epidemiological Project

The Woodlawn data were gathered prospectively on the total population of first grade children in this poor, black, Chicago community in consecutive cohorts in the 1960s. We focus here on the 1966–1967 first grade children. They were assessed three times in first grade and again in third grade regarding their psychological wellbeing and their social adaptation status (SAS), and they were followed up 10 years later at age 16 or 17. Data were also gathered from the families of this cohort when the children were in first grade and again at the time of the 10-year followup.

In 1975–1976, we reinterviewed 939 (75%) of the mothers or mother surrogates out of the 1242 families from the 1966–1967 total first grade population. The mothers' refusal rate was 5.9 percent, and an additional 18.5 percent of mothers were not reinterviewed because we could not find them, because the families had moved from Chicago, or because their children from the study population were deceased. After the mother was interviewed and had given permission, the teenager was approached. Of the 939 teenagers of the reinterviewed mothers, 75 percent (n = 705) participated in the reassessments, 14.5 percent refused to participate, and 10.4 percent had moved out of Chicago or were unavailable because they were in an institution or had unknown addresses. The study population for this paper consists of the 705 teenagers whom we reassessed. (For further information regarding the methods of tracking and follow-up and their possible influences on the sample, see Agrawal, Kellam, Klein, and Turner 1978.)

In order to assess possible bias resulting from sample attrition, we compared the mothers whom we reinterviewed with those we did not, using the early information we had on both. The mothers whom we could not reinterview were more likely to have started childrearing in adolescence, had been more mobile before and during the child's first grade year, and had children who were more likely to have been in parochial schools in first grade. The mothers were not distinctive in their 1966–1967 psychological wellbeing, early family income, welfare status, or the number or types of adults at home. We found little or no difference in the social adaptational status or psychological wellbeing between children reinterviewed and those not reinterviewed (Kellam, Ensminger and Simon 1980).

Teenage Self-Reports of Delinquency

Based on previous research in the area of crime and delinquency, we have chosen self-reports of antisocial behavior to be the delinquency measure. We

believe it represents the behavior of the individual better than reports of
official contact (Hardt and Peterson–Hardt 1977). Official contact mea-
sures reflect not only the individual's behavior but also the decisions and
policies of police and court personnel.

The information on delinquency in this paper comes from responses to
items in *What's Happening?*, a questionnaire administered to the teenagers
who participated in the followup sessions. This instrument is a modified
version of a delinquency scale developed by Gold (1970) and used by
Johnston (1973) and Lefkowitz et al. (1977). Gold validated responses to
these items by corroborating teenage self-reports with those ascribed to an
individual by his/her peers. He found that the two assessments were in
agreement for the large majority of respondents. Little evidence for difference
in truthfulness was found for either race or socioeconomic class.

Woodlawn had the highest rates of official juvenile delinquency as
measured by juvenile court data of the 76 Chicago neighborhoods in 1975,
the time of the collection of the self-report data. The mean self-reports of
antisocial behavior are higher than those in any other study of delinquency
that we have found (Lefkowitz et al. 1977; Gold 1970). Both the self-reports
of antisocial behavior and official court records show this population to be
one with high rates of delinquency.

The original data on delinquency consisted of answers given by the
teenage respondents to 23 items asking how frequently they had performed
certain acts in the last three years. Table 6–1 lists the original 23 items.
There were five possible responses to each question, ranging from "never" to
"five or more times." We undertook extensive psychometric analyses of the
items in order to examine three major questions: whether the latent structure
was uni-or multi-dimensional, whether some items did not fit, and whether
the latent structure was the same for males and females.

Initial factor analysis seemed to indicate a number of separate factors, but
these factors lacked stability in randomly selected subsamples. In order to
explore the hypothesis that some or all of the 23 items formed a single
ordered continuum, we performed a Rasch analysis of the items. Rasch
modeling is a method for examinng a set of items answered by a group of
persons in order to calibrate the "abilities" of the persons and the
"difficulties" of the items on an interval scale. It provides statistics for
assessing the goodness of fit of items and persons to the unidimensional
scale. (See Wright 1977.) We performed the analysis separately for males
and females and tested the difference in the latent structure between the
sexes.

The Rasch analysis showed that all but two of the items (those starred in
table 6–1) fit an underlying continuum reasonably well. In our sample, the

difficulties of the items diverged only at the very upper end of the scale for males and females, but, given the small number of respondents at the upper end, the differences were not statistically significant. We therefore assigned each respondent an overall delinquency score based on the Rasch analysis of the 21 remaining items for males and females together. This score is along an interval scale with a standard deviation of 0.855 and is the dependent variable analyzed in this paper.[1]

Table 6-1. Items Used for Self-Reports of Delinquency in the Last Three Years, in Order of Degree of Delinquency as Determined by Rasch Analysis

	Males (N = 334)	Females (N = 361)
Stayed out later than parents allowed	87.7%	80.2%
Drunk beer or liquor without parents' permission	64.8	51.2
*Smoked in school	45.0	46.0
Skipped a day of school without a real excuse	65.6	55.3
Had to bring parents to school because of something you did	74.8	57.8
Taken something from a store without paying for it	63.5	45.6
Suspended from school	64.1	46.1
Carried a weapon	55.2	26.3
Taken something not belonging to you	58.9	41.1
*Argued or had a fight with either of your parents	35.1	41.6
Got into a serious fight with a student at school	51.8	31.7
Been in trouble with police	48.5	16.6
Participated in a gang fight	41.5	18.6
Went into someone's land or into someone's house when you weren't supposed to be there	39.7	17.2
Got something by threatening a person	35.3	14.2
Hurt someone badly enough to need bandages or a doctor	39.8	16.3
Damaged school property on purpose	32.2	12.6
Hit a teacher	29.4	18.9
Run away from home	14.1	12.1
Hit your mother	8.8	8.1
Hit your father	9.0	8.0
Taken a car without permission of the owner	16.1	1.3
Taken part of a car without permission of the owner	17.1	1.6

*These items did not fit the unidimensional contiuum and were omitted from the analysis.

The dependent variable—the Rasch delinquency score described above—is an interval variable, and the predictors are categorical variables. The standard statistical model for analyzing the effect of categorical variables on an interval variable is analysis of variance. Analysis of variance, however, assumes that the relationship of the predictors to the dependent variable is linear and constant throughout the scale on which the latter is measured. We have no theoretical reason to assume that this is the case. Hence we decided to group the scores into three categories and analyze the data using log-linear models for contingency tables. (See Habermann 1979; Bishop, Fienberg, and Holland 1975; Goodman 1972.) For reasons explained below we used separate categories for males and females. Within each sex the middle category included all scores within half a standard deviation from the mean, while the lower and upper categories included the more extreme scores.

Despite our exclusive use of categorical methods for statistical inference, we do take advantage of the interval properties of the data for descriptive purposes. We often interpret the statistical results of the categorical models in terms of the location and shape of the distribution of the Rasch delinquency scores. These methods provide more information than categorical data alone and also allow us to assess the males and females on the same scale.

Results

Sex Differences

As we should expect we found large differences in our data in the level of delinquency between the sexes. About 75 percent of the males were above the median for the females. Figure 6–1 shows the distributions of the two sexes. Our previous research on first grade predictors of other teenage outcomes indicated that males and females differed in the predictors that were most powerful (Kellam, Ensminger, and Simon 1980). In order to bring out these differences clearly, we analyzed the males and females separately.

The size of the difference between the sexes, however, precluded our using the same cutpoints for males and females. When we calculated cutpoints for a trichotomy using the mean and standard deviation from the whole sample, the high category contained only 18 percent of the females but 47 percent of the males. Since increasing the number of categories made the tables too sparse, we decided instead to use different cutpoints for the sexes. The reader
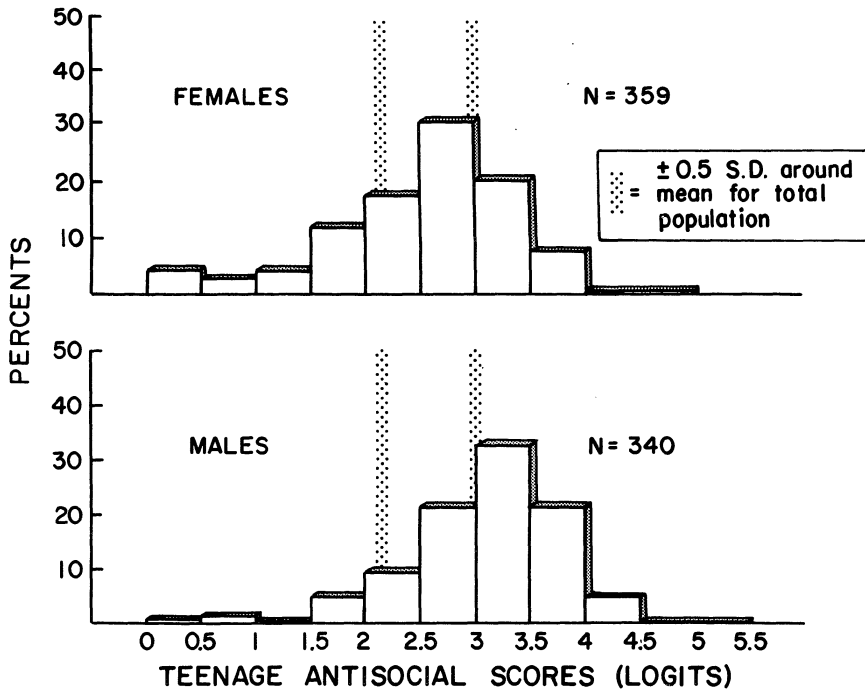
Figure 6-1. Antisocial Behavior by Teenage Males and Females

should bear in mind, when examining the data presented here, that the categories for males and females do not represent the same segments of the delinquency scale.

First Grade Teacher Ratings and Teenage Delinquency

Measures of classroom SAS for the first grade children of Woodlawn were obtained by asking the natural raters in this social field—teachers—what social tasks were expected of children. We formed scales based on the teachers' answers and then asked the teachers in standardized fashion to rate the children in their classroom on each scale.

The primary instrument used to measure SAS in the classroom is thus the Teacher's Observation of Classroom Adaptation (TOCA), which contains

five rating scales measuring different social tasks the child was expected to perform: social contact (shyness—sitting alone, not speaking up much, having few friends); authority acceptance (aggressive behavior—fighting and breaking rules); maturation (not clinging); cognitive achievement (learning up to ability as the teacher sees it); and concentration (paying attention). In addition, a global scale was included of how well the child was doing overall in becoming a student. During a standardized interview, each teacher rated the students on each social task according to a four-point scale running from adaptive behavior to severely maladaptive behavior. Teachers made TOCA ratings early in the 1966–67 school year, at midyear, at its end, and again in third grade. Reliability and validity data for these SAS scales are reported in Kellam et al. (1975).

In these analyses we use only end-of-year TOCA ratings. In the analyses to follow, the TOCA scales are treated as categories and collapsed to produce three maladaptive patterns of responding, each with three levels (not at all, mild, and moderate or severe). The three patterns are: shyness; aggressiveness; and learning problems, where the score consisted of the most severe rating given by the teacher in either cognitive achievement (does the child learn up to ability as the teacher perceives it), maturation (acting with sufficient independence to accomplish first grade tasks), or concentration (paying attention for a sufficient span of time to allow for teaching and learning). This approach to learning problems is similar to Kohn and Rosman's (1972) concept of task orientation and to a learning problems category developed by Lambert and Nicoll (1977).

We first analyzed the effects of first grade teacher ratings of shyness, aggressiveness, and learning problems on delinquency. Log-linear analyses show clearly that first grade aggressiveness and shyness predict delinquency ten years later for males, but not for females. Learning problems alone do not predict delinquency for either sex. Figure 6–2 illustrates these relationships. Each of the four panels contains a histogram showing the distribution of the Rasch delinquency score for a given population. The four populations are those at the moderate or severe levels of the first grade measure, whose behavior brings out the effect most clearly. From the bottom up they are: those rated as neither shy nor aggressive; those rated as moderately or severely shy and moderately or severely aggressive; those rated as moderately or severely aggressive but not shy; and those rated as moderately or severely shy but not aggressive.

It is clear from these diagrams that, as compared with the base category, first grade shyness without aggression inhibits delinquency ten years later, while first grade aggression without shyness promotes delinquency ten years later. Forty five percent of the first grade shy nonaggressive males were in the
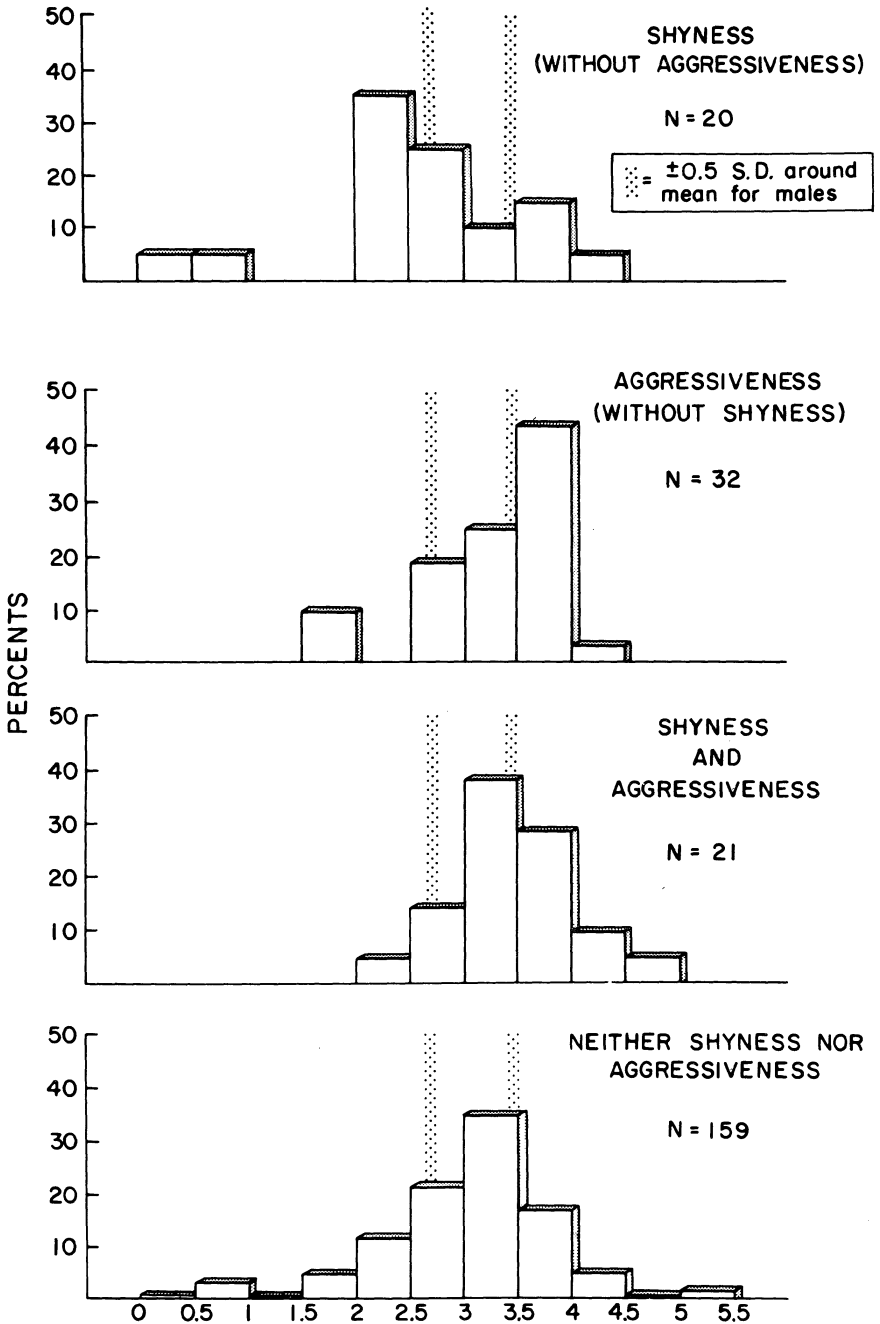
Figure 6–2. Shyness and Aggressiveness (Moderate and Severe) in First Grade and Teenage Antisocial Behavior by Males

lowest of the three delinquency categories ten years later, as compared to 9 percent of the aggressive nonshy males and 21 percent of those neither shy nor aggressive. It is important to recognize that these are two separate effects: shyness and aggressiveness are not simply the opposite ends of a single scale.

The log-linear analysis does not show a statistically significant interaction between the effects on delinquency of shyness and aggressiveness. Nevertheless, certain characteristics of our data together with our previous research on shyness and aggressiveness persuade us that such an interaction may well exist. Since there were only 21 males in our sample who were rated moderately or severely shy and aggressive, only a very large effect would be likely to create a finding in our sample that would be statistically significant at the .05 level. If the effects of shyness and aggressiveness were additive we would expect the moderate or severe shy/aggressives to be less delinquent than the aggressive subjects and more delinquent than the shy subjects. In fact, they are even more delinquent in our sample than the aggressives: 38 percent of them are in the highest delinquency category, 13 percent more than the aggressives. Since this 13 percent in fact represents only about three people, we cannot conclude with much confidence that shyness in the presence of aggressiveness increases rather than reduces the risk of delinquency; but we feel confident in asserting that shyness in first grade inhibits delinquency ten years later only when it is present without aggressiveness. In the presence of aggressiveness it loses its inhibiting power. Our previous research on substance use also found that the combination of moderate or severe shyness with moderate or severe aggressiveness in first grade led to the highest risk of maladaptation ten years later.

First Grade Cognitive Tests and Teenage Delinquency

Next we examined the effects of the two test measures of cognitive achievement in first grade, Metropolitan Readiness Test (MRT) and IQ. We use the first grade child's MRT and IQ scores as quasi-SAS measures. The schools use these indicators in assessing the child's performance, and they represent the child's success at the cognitive tasks in the classroom. The MRT and Kuhlmann-Anderson Mental Maturity Test were administered to the students early in first grade by the teachers or staff in the Chicago public schools, but not in the Catholic schools. These variables had 4 and 3 levels respectively. Since these variables may be related to the teachers' ratings, we analyzed each in a log-linear model together with shyness and aggressiveness, as well as delinquency.

The best fitting models confirm that aggressiveness and shyness predict delinquency only for males. Cognitive test performance in first grade, however, appears to predict delinquency only for females. We wanted to test whether these two effects were independent by estimating a joint model including both IQ and MRT. This proved to be impossible, since 41 out of the 53 girls who scored "immature" (the lowest score) on the MRT did not have IQ scores. Since, as noted below, most of the effect of both of these tests was in the difference of the lowest category from the others, the inclusion of IQ made it difficult to estimate an MRT effect. In fact, the log-linear model with both IQ and MRT showed only a significant IQ effect, but in view of the problems of missing data, we cannot regard this as conclusive.[2]

Figures 6–3 and 6–4 show the distribution of delinquency scores among females within categories of MRT and IQ. Table 6–2 presents the distributions of the delinquency trichotomy used in the log-linear analyses for the categories of these two variables. Most of the effect of MRT is due to the immature girls having lower scores than the other three categories; 41.5 percent of these subjects had "low" delinquency scores, as opposed to about 20 percent for each of the other categories.

The results for the IQ scores as shown in figure 6–4 and table 6–2, are quite similar. Again, the lowest category has lower delinquency than the others. Low cognitive test performance in first grade girls appears to predict less delinquency ten years later.

Family Characteristics and Teenage Delinquency

Family structure is measured in the mother interview in first grade and at the time of the followup in terms of the adults present in the child's home. In the first interview there were 86 different combinations of adults present in the childrearing families; these were classified first into ten categories, then into six for analytic purposes—mother alone; mother/father families with or without other adults; mother/grandmother or /aunt families; mother/step-father families; mother/other adults (most often a sibling over 18 years); and mother absent families. In our analyses of the effects of family structure and atmosphere, we analyze the effects of these variables at time 1 and 2 together, in order to study whether change or stability of the family have effects on teenage outcome.

For the analyses here we used two simplified classifications. One classified the family into six categories: mother alone, mother and father, mother and grandmother or aunt, mother and stepfather, mother and other
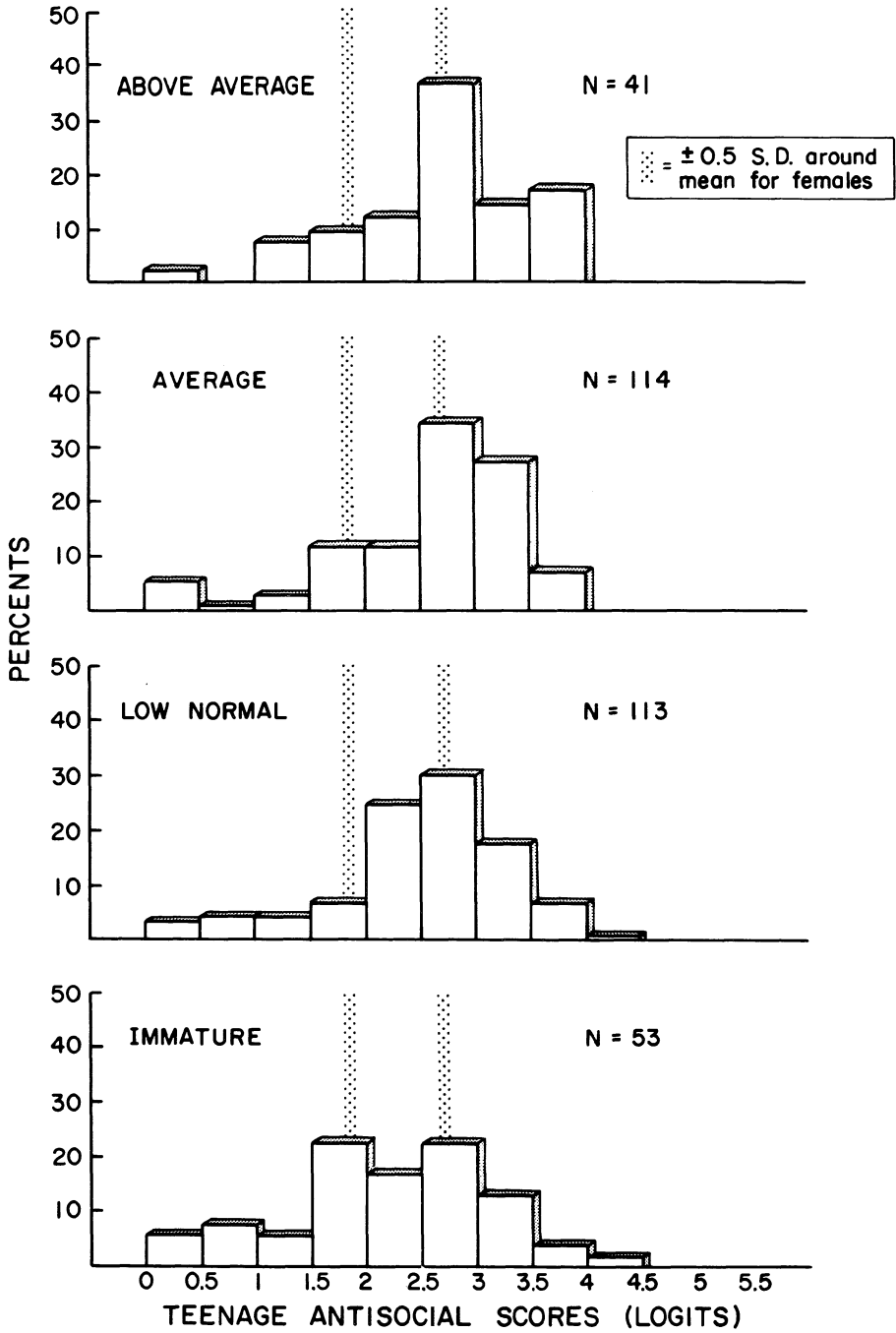
Figure 6–3. First Grade Readiness Test Scores and Teenage Antisocial Behavior by Females
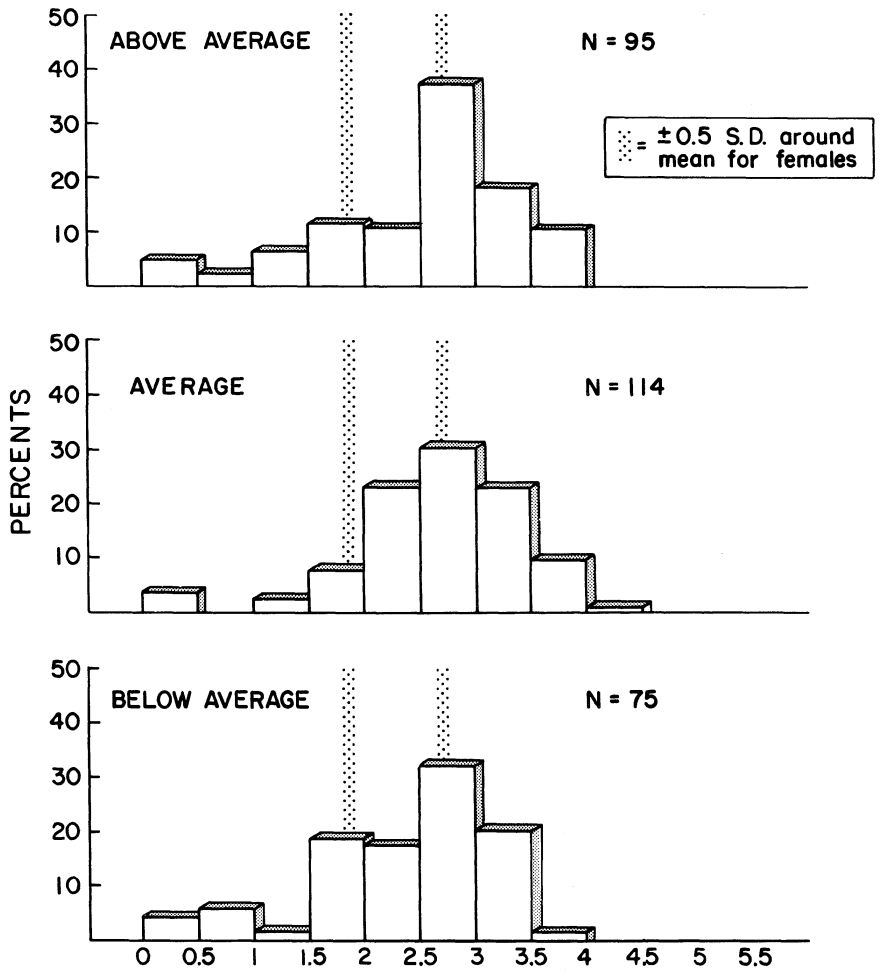
Figure 6–4. First Grade IQ Scores and Teenage Antisocial Behavior by Females

Table 6–2. Distributions of Delinquency Scores in Different Categories
of First Grade Readiness Test (MRT) and IQ Scores Among Females

	Delinquency Score (percent)			
MRT Scores	Low	Middle	High	N
Immature	41.5	39.6	18.9	53
Low Normal	19.5	50.4	30.1	113
Average	20.2	43.0	36.8	114
Above Average	19.5	48.8	31.7	41
IQ Scores				
Below Average	29.3	49.3	21.3	75
Average	14.0	47.4	38.6	114
Above Average	24.2	45.3	30.5	95

(usually an older sibling), and mother absent. The second classification took advantage of our previous research on family composition and adaptation in the firstgrade classroom to place most families in either a high risk or a low risk category. (Because mother/stepfather families appeared to have opposite effects in two cohorts studied previously, we omitted them from this dichotomy.) The low risk category included both mother/father and mother/ grandmother or /aunt families, while the high risk group included mother alone, mother absent, and mother/other families. We used only the dichotomy in our log-linear models.

First we analyzed the effects of family composition in first grade and ten years later on delinquency ten years later. There is weak evidence of an effect of family composition at the time of first grade on delinquency ten years later for males ($p \leq .09$), and no evidence for females. (Normally this level of significance of the effect would lead to the acceptance of the null hypothesis, but, in view of the findings reported below, we decided to report it.) Family type ten years later at the time of the teenagers' reports of delinquency was not related to delinquency for males or females. This implies that the effect of early family composition for males is set by first grade. Change or stability of the family type afterwards has no additional effect on teenage delin- quency.

Since we know that first grade family composition was related to the teacher ratings, we performed a joint analysis of the effects of aggressiveness, shyness, and family type in first grade on delinquency ten years later. This analysis revealed an interaction of the effects of first grade family com- position and first-grade aggressiveness. The histograms in Figure 6–5 and
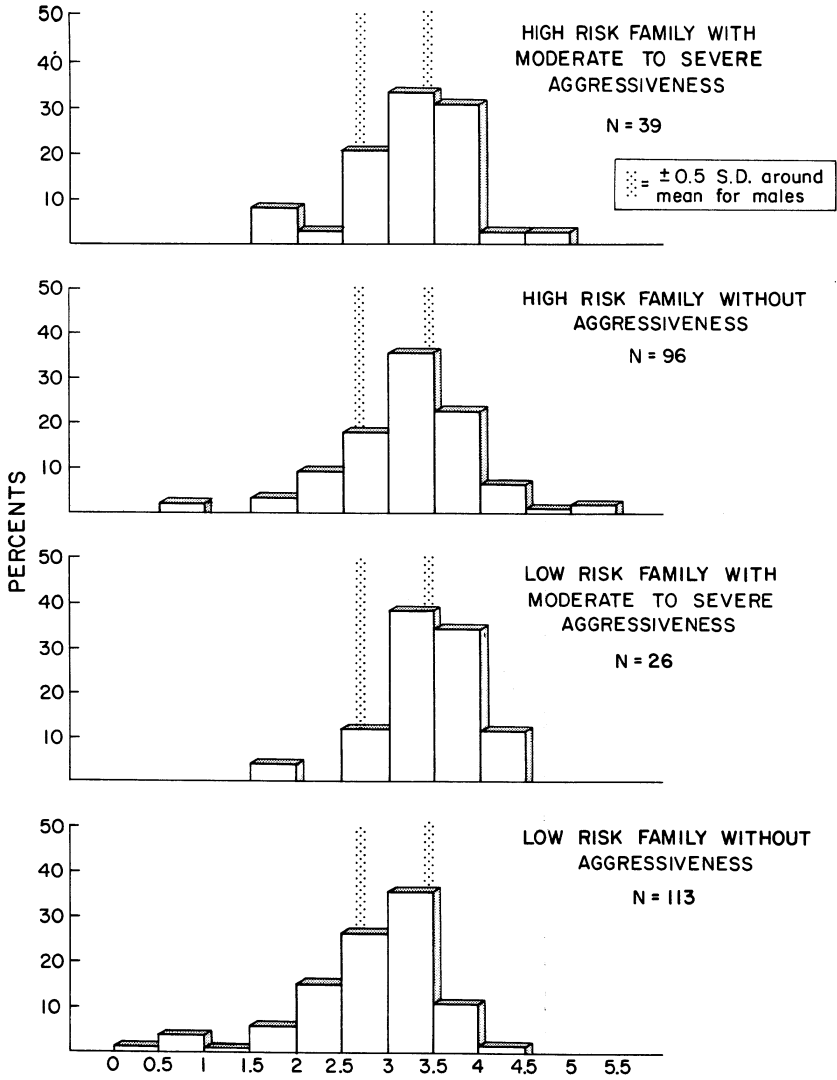
Figure 6–5. Family Type and Aggressiveness in First Grade and Teenage Antisocial Behavior by Males

the "tree" diagram in figure 6-6 illustrate of what this interaction consists.

The relationship among the three variables for males can be summarized in three points. First, the low risk families produce fewer children who are aggressive by the end of first grade, although the difference is not quite significant at the .05 level ($X^2 = 5.44$, df = 2, p = .066); second, children from low risk families who did not become aggressive by first grade have a reduced risk of delinquency ten years later; and, third, those children from low risk families who became aggressive by first grade do not differ in delinquency ten years later from those children from high risk families in first grade.

Since performance on first grade readiness and IQ tests rather than teacher ratings of shyness and aggressiveness predicted teenage delinquency for females, and since MRT and IQ scores might also be related to family type, we also examined the joint effects of family composition, first grade test scores, and delinquency. As before, we found no relationship between first grade MRT and IQ test scores and teenage delinquency for males. For females, however, IQ and MRT are still significant predictors; furthermore, although first grade family type alone does not predict teenage delinquency among females, it does appear to modify the effect of IQ.

The log-linear parameters for the interaction of the effects of first grade IQ and family type on delinquency show the interaction clearly. The only statistically significant parameters were those for the lowest IQ level. Family type in first grade does affect delinquency for the girls with the lowest IQ scores ($X^2 = 6.72$, df = 2, p = .03). Girls with low IQ's from low risk
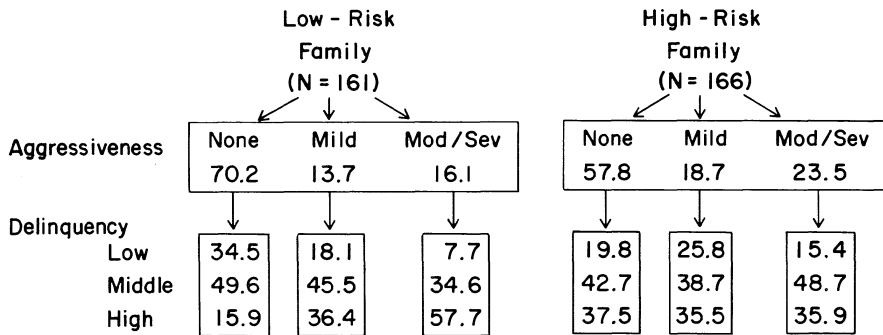
Figure 6-6. Family Type and Aggressiveness in First Grade and Delinquency Ten Years Later Among Males

families have considerably less delinquency ten years later than any other group.

Although the total interaction of the effects of MRT and family type on delinquency is not significant for females, the same effect exists there. One of the log-linear parameters of the interaction in the lowest MRT category is statistically significant, and family type does have a significant effect on delinquency within the lowest category of MRT ($X^2 = 6.37$, df $= 2$, p $= .041$). Again, the girls with low cognitive performance from low risk families have significantly less delinquency ten years later. Family type has no effect within the other categories of MRT.

We also examined other social structural variables in first grade to see if they predicted delinquency ten years later. The mothers were asked to report their yearly family income in both interviews. We have trichotomized the income categories into low, middle and high. Neither family income at time 1 or time 2, had any direct effect on delinquency ten years later.

Summary of Results

Males report antisocial behavior more frequently than females; self-reported delinquency in this population is considerably higher in comparison to other populations in which self-reports of delinquency have been assessed.

First grade teachers' ratings of SAS are related to delinquent behavior for males. Males who were shy in first grade report less delinquency as teenagers. Both aggressive and shy-aggressive males report more delinquency. Males who were adapting or had only learning problems were in the middle. While the same patterns appear for females, the differences are not statistically significant. These findings are very similar to ones relating to substance use in this same population.

For females, first-grade cognitive test performance was related to later self-reports of delinquency. Those females who scored in the lowest category on either the MRT or the IQ tests also reported the lowest delinquency ten years later.

Family structure in first grade, but not 10 years later, seemed to operate for both males and females, to increase or decrease the risk of the variables cited above. Males who were aggressive in first grade had an increased risk of delinquency ten years later, regardless of family type. However, males who were not aggressive in first grade and who were in a high risk family type were as likely to be delinquent as the aggressive males, whereas non-aggressive males in a mother/father or mother/grandmother family had less delinquency ten years later. For females, poor performance on the first grade

IQ or MRT tests was associated with less delinquency only for those girls in mother/father or mother/grandmother /aunt families.

Family income at either time 1 or time 2 was not related to delinquency.

Discussion

The Woodlawn analyses reveal antecendents of delinquency as early in the child's life cycle as first grade. These antecedents lie in the social structure and atmosphere of the family and in the specific quality of the child's social adaptation to school. It is likely that we will be able to find new antecedents and better specify the operation of those we have already found in the areas of adaptation to school, family structure and atmosphere, and psychological wellbeing. Such work is essential to developing programs of prevention.

Woodlawn is an urban, poor, black, and overcrowded community. As an example of community epidemiology this project holds constant the macroscopic characteristics of delinquency and focuses on the distribution of delinquency and other outcomes in relationship to variation in the social structure, social adaptation, and psychological characteristics of the population. Age specific, community specific studies are necessary complements of broader studies of social and psychological function, such as those on national probability samples. Because community studies focus on defined populations, they may reveal rates of delinquency, for example, to be higher or lower than rates in other communities or in less specific samples. Rutter (1970) also noted the necessity of community studies, saying that one cannot base national scale planning on nationwide statistics, which do not reflect the differing needs of different areas. Mental health and illness, as well as delinquency have been shown to vary considerably from one community to another, and therefore warrant attention from studies within specific kinds of communities. Indeed, the relationships between social, psychological, and biological variables and delinquency and psychological wellbeing may vary from one kind of community to another.

The study of sex differences provides a strong tool for understanding the etiology of delinquency. In the Woodlawn data, psychometric analyses of the self-reports of delinquency lead us to conclude that males and females used the scale in a similar way—that is, there seemed to be one major underlying dimension for both sexes. However, in the Woodlawn population, as in almost any population in which sex differences have been studied, the distribution of males and females differed so much that we could not use in analyses the same categorization of low, middle and high delinquency.

Equally important, our findings suggest that the paths that lead to delinquency are quite different for males and females.

Aggressiveness and shyness in first grade were important predictors of later delinquency, but only for males. These results are very similar to our earlier analyses of drug, alcohol, and cigarette use in which first grade, teacher rated aggressiveness enhanced later substance use and shyness inhibited use—again only for males. The absence of such results for females suggests major differences in the socialization and/or development of males and females.

Learning problems at the end of the first grade did not predict delinquency for either males or females. On the contrary, for delinquency as well as for use of drugs, alcohol, and cigarettes, learning problems revealed no antecedent relationship. Analyses of the teenage outcome of psychological distress, however, revealed first grade learning problems to be an important antecedent (Kellam et al. 1983).

Among Woodlawn males, family structure interacted with aggressiveness. First, in those families with another adult in addition to mother—either father, grandmother, or aunt—there were fewer aggressive boys. In these low risk families, the nonaggressive males had less risk for later delinquency. The low risk families seemed able to inhibit the development of antisocial behavior by these nonaggressive males. Second, in the high risk families, where either no second adult was present or one less blood related, aggressive first grade males were more frequent; but nonaggressive boys were as likely to be delinquent ten years later as were early aggressive males.

Family structure at first grade was important, while family structure at age 16 or 17 was not. This suggests that the benefits of the low risk family structure are more than stronger adolescent supervision or external control. Also, the fact that aggressive first grade males from low risk families are as likely to be delinquent later as those from high-risk families suggests that there is something inherent in early aggressive males that is not easily amenable to family control. It may be, however, that certain low risk families enhance the early and continuing aggressiveness of their sons.

Studies by Bandura (1965) suggest that training may be important in the sex differences on aggression. He found that while males were found to be more aggressive than females in the experimental setting, after children were offered attractive reinforcements for aggressive behavior, the disparity in aggressiveness between girls and boys almost disappeared. These results suggest that the sex difference in real life is vulnerable to reinforcement of male and female behavior, and is not a fixed characteristic.

The importance of early aggressiveness in males as a predictor of later antisocial behavior has been underlined in several studies; however, the

impact of early shyness as an inhibitor of later antisocial behavior has been much less investigated and understood. The Woodlawn data suggests that first grade shyness and being a female are both associated with less substance use and less delinquency later on in mid-adolescence. These two may be related biologically, socially, or psychologically and this area presents important avenues for further research.

Early learning problems and early cognitive test performance did not relate to later delinquency for Woodlawn males. The relationship between school failure in adolescence and delinquency is frequently reported in the literature. It may be that the relationship between school failure and delinquency found in other studies derives from the strong association between learning problems and aggression. The longitudinal nature of the Woodlawn data and the separation of learning problems from aggression in first grade made it possible for us to examine their independent or combined contribution to delinquency. The results reported here are the same as those we found for antecedents of substance use, thus lending further reassurance to this inference (Kellam et al. In press). In our results, shyness, often accompanied by learning problems, inhibits later delinquency, aggressiveness, also often accompanied by learning problems, enhances later delinquency, and learning problems alone are not related to later delinquency.

For females, cognitive test performance is related to later delinquency, but in the opposite direction to that suggested by the literature. Girls who performed in the lowest categories on the cognitive tests reported the least delinquency later. However, family structure was also involved here. Only those low scoring females from the mother/father, mother/grandmother or mother/aunt families showed this reduced risk. Earlier Woodlawn findings show that females in the "immature" category on MRT formed stronger family bonds and weaker peer bonds as teenagers than the other females (Ensminger, Brown, and Kellam, 1982). Early poorly performing females may either have difficulty becoming independent of their families (explaining both their low performance and low delinquency) or retreat to their families as an alternative source to the school for social support. However, this response appears only to occur in low risk families, i.e. those whose strength and warmth may be a haven from the stressful demands of school.

Our findings indicate the importance of examining the interplay of family and school on the later advent of delinquent behavior. While family structure has only a slight direct relationship to delinquency for males and no such relationship for females, the early family structure of Woodlawn children increases or decreases their vulnerability to conditions that lead to later delinquency.

Acknowledgments

Notes

1. Those respondents who claimed never to have performed any of the 21 acts mentioned in the items could not be scored directly on the Rasch scale. We assigned them scores by extrapolating the lower end of the scale. We also used the Rasch calibration of the items to assign scores to all respondents answering at least 19 of the 21 items. Only 6 of the 705 respondents failed to do so.

2. We do not know if the immature girls were unable to complete the IQ test, were far more likely to be absent when it was given, or scored so low that the schools preferred not to report their scores. It is also interesting to note that 47 percent of the girls rated as moderately or severely shy (15 out of 32) did not have IQ scores, as opposed to 17 percent of the nonshy and 25 percent of the mildly shy girls. Shyness is associated with low MRT scores.

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7 A PSYCHOSOCIAL APPROACH TO RECIDIVISM

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Introduction

Research on the criminal careers of subjects convicted for crimes has quite a long history. About one century ago Zebulon R. Brockway (1888) carried out what was probably the first followup study of a group of criminals released on parole. From the late twenties on (Burgess, 1928/29; Glueck and Glueck, 1930) the number of prediction studies in criminology has increased rapidly. In the past, many scholars have tried to develop instruments for early identification of delinquency-prone subjects (Glueck and Glueck 1950, 1959); to help decisionmakers in matters of parole (Glaser, 1962); or to develop base rates for studies in which the effectiveness of treatment programs or penal institutions is assessed (Mannheim and Wilkins, 1955). Unfortunately, many of these studies suffer from methodological short-comings.

In their critical analysis of the literature on recidivism Buikhuisen and Hoekstra (1974) made the following observations:

1) The great majority of these studies have been based on existing official records of delinquents (social inquiries, criminal records, etc.). Only in a few cases did the authors collect their data by directly interviewing or testing offenders. Working with existing records leaves us with questions about the reliability and the validity of the data concerned.

2) From a statistical point of view too many of these studies are rather unsophisticated. Often no tests of significance have been applied, and the majority of the investigators have resorted to univariate analyses. Information about the amount of variance explained by the predictors is rarely reported. Partial correlations carried out to establish the real contribution of a factor are usually lacking. Multivariate analysis is exceptional.

3) To our knowledge none of the recidivism studies have tried to cope with the problem of hidden delinquency—It is obvious that the value of a recidivism study completely depends on the reliability of the recidivism criteria used. It should be known by now that official crime records are highly disputable as a sole source to determine recidivism.

4) Almost without exception the recidivism studies we came across displayed a static approach. Most of these studies are of a transversal character. However, relapsing into crime is a process and therefore should be studied as such. This requires a longitudinal approach.

5) Finally, it is striking to see that there is hardly any integration of criminological theories in research with regard to recidivism.

All this was written in 1974. Is there reason to believe that the past seven years may be regarded as the "fat years" of criminological research on recidivism? We are afraid the answer has to be no. The general picture emerging from the more recent studies in this area does not deviate much from what has been observed above.

Recidivism Studies: Prediction of Crime Versus Verifying Theories

The great majority of recidivism studies are very much policy oriented. They focus on questions like:

—Is it possible to come to an early identification of potential criminals?

—Is it possible to distinguish a category of criminals who need special attention from probation or parole officers or from treatment institutions? Large case loads require optimal allocation of the available resources.

—Is it possible to develop a parole policy which, combining the interests of the criminals and society, successfully predicts which delinquents will persist offending after their release.

In all these cases prediction studies aim at a powerful result: optimal prediction of which subjects will turn out to be delinquency-prone. For this a good set of predictors is needed. The question of whether these predictors make sense from a theoretical point of view is not relevant. What matters only is whether they can discriminate between recidivists and nonrecidivists. However, prediction studies could serve another purpose too. De Groot (1967) has rightly argued: if we know something, we can predict and, on the other hand, if we cannot predict, we obviously know nothing.

There certainly is empirical evidence that criminologists are able to establish significant relationships between many kinds of variables and recidivism. Statistically significant multiple correlations have been found running somewhere from .40 to .55 (Simon, 1971) and even higher (Nijboer, 1975). So we certainly know something. An alternative use of prediction studies could be as an instrument to test hypotheses suggested by the literature or by previous exploratory research. Another use might be to achieve more insight into the etiology of crime. It is our feeling that this inherent potential of prediction studies is neglected in criminological research. Below an example will be presented to illustrate that predicting recidivism can be a useful aid in testing theories in crime causation.

Method[a]

Sample

The research presented here is part of a longitudinal project on a sample of 296 criminals, sentenced to imprisonment and followed for a period of at least 3 years after their parole. The sample consisted of property offenders (80%), sexual offenders (16%) and violent offenders (4%). Socio-economic

background of the subjects was predominantly working class. Their ages ranged from 16 to 59 years (mean age 34). The sample consisted of males only. Table 7–1 shows a breakdown of the sample by age and offense type. In this paper we will report on a subsample of the abovementioned group. Two reductions have been made: First the analysis was confined to those criminals convicted for property offenses. This made our sample more homogeneous, which is important from a differential criminological perspective (different types of criminal behavior should be explained in a different way, Buikhuisen, 1979). Second offenders with missing data were excluded. Thus the final sample size was 117.

Data Collection

The project consisted of a quasi-longitudinal and a longitudinal part. In the quasi-longitudinal part the criminal was interviewed shortly before getting his parole. The interview covered his childhood, elementary school period, adolescence and the year immediately preceding this present prison term. Subsequent interviews were taken at 2, 8 and 14 months after release from prison. Then, the followup for officially registered criminality was between 3 and 5 years. Finally a self-report questionnaire was administered to estimate the incidence of unofficial criminality.

In addition to interviews, several psychological tests and criminal career data (registered and self-reported crimes) were collected. Table 7–2 gives a summary of data collection by time period.

Table 7–1. Total sample: breakdown age by offense type.*

| | Age Breakdown | | | |
	16–25	26–30	31–59	
Property offender	138	46	54	238
Sexual offender	10	4	33	47
Violent offender	6	3	2	11
Total	154	53	89	296

*Age refers to age at time of the first interview in the prison. Offense refers to the type of offense for which the criminal received his present conviction.

Research Design

The original objective of the study was fourfold:

1) To answer the question: In which respects do criminals differ from noncriminals;
2) To answer the question: What determines recidivism of parolees starting from the time they were released from prison;
3) To answer the question: Is it possible to predict recidivism;

Table 7-2. Data Collection Schedule

1.   In prison—shortly before release on parole
1.1 Retrospective Interview Developmental Periods Covered:

Early childhood period	Elementary school period	Adolescence period	Year preceding prison term
Family situation:	Behavior:	—work history —evaluation	—work history —relationship with employer & colleagues.
—structure	—at school	—presence of personal problems	—situation at home
—atmosphere	—relationships		
—intrafamilial relationships	with teacher & class-mates.		—relationships with family & partner.
—running away	—truancy —evaluation		—relationships with friends
			—leisure time activities.

1.2 Psychological tests
     —California Psychological Inventory (Gough, 1948).
     —Amsterdamse Biografische Vragenlijst (Wilde, 1961).
       measuring neuroticism, extraversion and neurosomatic complaints.
11. Interview after release on parole
11.1 Interviews taken at 2, 8 and 14 months   situation at work, at home, in the
     neighbourhood, leisure time and self-concept.
11.2 Official criminal records   checked after a followup period of at least 3
     years.
11.3 Self-reported crime data

4)   To assess the effectiveness of the supervision by parole officers.*

To answer the first question, a control group was constructed, consisting of subjects without a criminal record. Criminals and controls were matched on the following variables: age, sex, marital status, profession and neighborhood. Questionnaires and tests were identical to those administered to the criminals in prison.

As it has been argued that test scores are influenced by the situation in which the subjects are tested, a second control group was introduced. This group consisted of subjects without a criminal record who were hospitalized because of a traffic accident. Both groups were matched for age, sex, marital status and profession. As both groups were institutionalized we hoped to be able to test the hypothesis that being institutionalized influences test scores. This second control group was not interviewed, but only tested with California Psychological Inventory (CPI) and the Amsterdamse Biografische Vragenlijst (ABV). The research findings pertaining to the above mentioned questions have been published elsewhere. In short these findings were:

1)   Highly significant differences were found between criminals and noncriminals;
2)   Many variables were significantly related to recidivism. A multiple correlation coefficient of .48 was obtained;
3)   For several of the psychological tests a hospitalization effect could be established. The hospitalized control group differed significantly on all CPI scales and on neuroticism, introversion and neurosomatic complaints from the prison group. Important, however, is that for all the CPI scales and extraversion, significant differences were found between the criminals and both the control groups. This means that the hospitalization effect explains only part of the difference between criminals and noncriminals. Also, not all tests are equally influenced;
4)   The impact of parole officers on recidivism is negligible.

The main objective of this paper is to see whether it is possible to develop a model which enables us to understand the process of becoming a recidivist. The main dependent variable is recidivism, measured by both registered and self-reported criminality. This information was obtained between 3 and 5 years after parole.

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*All subjects were on parole.

The major predictors will be data from the quasi-longitudinal part of the study (information collected shortly before parole). According to our theory, becoming recidivist is a process that needs to be studied from a developmental point of view. A longitudinal theoretical model was constructed and operationalized in the framework of a latent variable causal model.

Description of the model

In the model a central role is given to the concepts of impulsivity, conscience and socialization as measured by the California Psychological Inventory (CPI). A consistent and crossculturally stable finding in the literature is that the socialization scale, the responsibility scale and the self control scale differentiate criminal and noncriminal populations (Gough 1965). Table 7–3 shows their intercorrelations (all significant at the $p \leq .001$ level). In our theory a chronological relationship is postulated between these three concepts: Impulsivity (low self control) will lead to low conditionability (Gray, 1976) with, as a consequence, problems in conscience formation which, in turn, will further a low sense of responsibility. From this it will be only "one step" to displaying anti-social behavior which will reflect itself in a low score on the socialization scale. This means that in our model one path leads from impulsivity via lack of responsibility to a low score on the socialization scale. In the meantime there is a sound empirical basis for a direct path between lack of self control and poor socialization.

On the other hand it is a well established fact that the father plays an important role in the development of his child's conscience. So a direct line should be drawn from father-son interaction to the responsibility score, while of course the quality of this interaction will be related to the extent of impulsivity of the son (Bell, 1968). An inadequately developed conscience should have its impact on the behavior of the subject during childhood. Here the following variables are relevant: behavior at school, playing truant, running away from home and an overall score of the behavior during childhood. These items can be divided into two factors: childhood behavior (behavior at school and behavior in general), and a kind of "control" factor. the latter consists of the items: running away from home and truancy. As these two variables are negatively correlated with the question of whether the father knows what his son is doing, this factor could be labeled lack of control by major socializing agents; father and school. So two more lines can now be incorporated in the model: one running from the responsibility to childhood behavior, the other from responsibility to the lack of control factor.

It makes sense to postulate that the anti-social behavior manifested at

Table 7-3. Intercorrelations of CPI scales

CPI Variables	Correlation		
Socialization	1.00		
Responsibility	.68	1.00	
Self-control	.60	.69	1.00

childhood, as it relates to a badly functioning conscience, will be continued at adolescence—resulting in street fighting and getting into trouble with neighborhood and police. On the other hand, dysfunctioning at home and at the elementary school level will have a negative influence on the feelings of self-esteem. As having a positive identity is of crucial importance in our culture, an alternative strategy has to be found to restore the balance. One possibility is a change in frame of reference; looking for peers in a similar position or joining a subculture whose norms and values one is able to meet. Combining these items (antisocial behavior, frequenting bars and having friends who exercise a negative influence) leads to a factor labeled the "tough guy" factor. In our model it is predicted that bad childhood behavior and lack of control by major socializing agents will lead to "tough guy" behavior. As the latter will interfere with integrating the norms and values of the dominant culture, the next stage in the process is a negative outcome of the socialization process, reflected in a low score on the socialization scale of the CPI. A direct relationship is hypothesized between impulsivity and respectively, the "tough guy" factor and socialization.

By now it is understood that subjects with a low socialization score are more vulnerable to transgressing the law. The question is whether we should expect a direct relationship here; it is our belief that a low socialization score by itself is not a sufficient condition. We must integrate the wellestablished fact that crime is related to levels of education and employment status reached by the subjects concerned. The picture can be "completed" by drawing a line from socialization through work and educational level (including number of job changes) to age of first conviction to recidivism. It is well known from the literature that the latter two are related. Figure 7-1 shows a diagram of the hypothesized model. In the following paragraph a brief description will be given of the statistical procedure used to estimate the parameters of the proposed theoretical model.
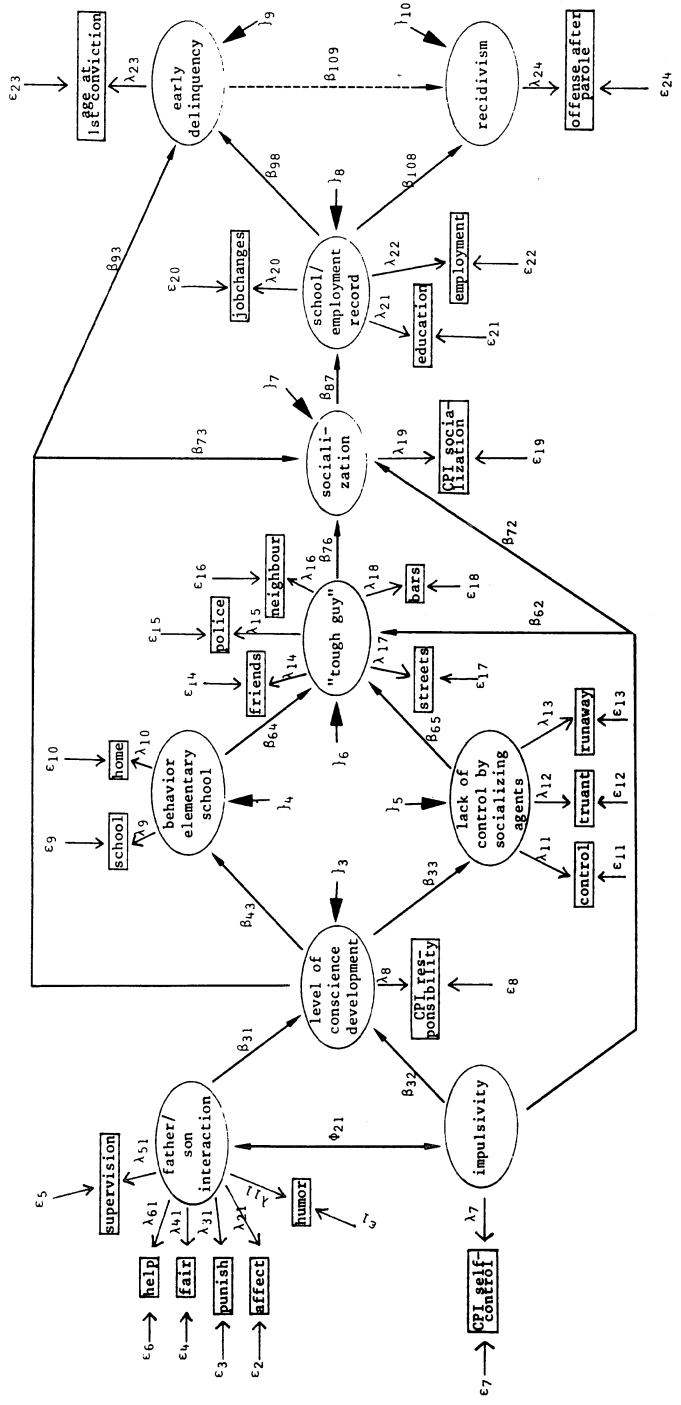
Figure 7–1. Recursive pathmodel: developmental process underlying recidivism

Model Estimation

Figure 7–1 is a graphical representation of the proposed recursive theoretical pathmodel of recidivism. The path diagram has been drawn following the notational conventions introduced by K. Jöreskog (1979). A rectangle symbolizes an observed indicator chosen to measure a certain underlying dimension or unobserved latent construct, depicted by an ellipse. In our model, five constructs are represented by a single indicator. The remaining five constructs are measured with multiple indicators, resulting in a more reliable and valid representation of these constructs. Conceptually the diagram can be divided into two parts:

1. The measurement model, specifying a priori the relationship between indicators and constructs. As an example the construct impulsivity is measured by a single indicator, the CPI self-control scale. The parameters λ (lambda) and ε (epsilon) correspond with factorloadings and uniqueness in factor analysis.
2. The structural model, indicating the presence or absence of direct or indirect relationships among the latent constructs. It specifies each endogenous variable as a function of other variables in the model. The parameters β (beta) can be conceived as regression or path coefficients. The parameter ϕ (phi) is a correlation coefficient. The variance of the disturbance term is expressed in ψ (psi), while the percentage variance explained in a dependent variable is derived as $1-\psi$.

The unknown parameters of the model in figure 7–1 have been estimated using the computer program LISREL. Because of its generality and flexibility LISREL provides an attractive framework for modeling complex phenomena like the developmental processes underlying (criminal) behavior. Given that the data (i.e. a correlation matrix) meet all necessary assumptions* LISREL yields maximum likelihood estimates of the unknown parameters with their standard errors (allowing for a t-test of significance on each parameter). The analysis-combining features of restricted confirmatory factor analysis and path analysis test the hypothesis that the model is a reasonable representation of the data. A chi-square test provides an overall measure of the goodness of fit of the model.

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*The assumptions are that all relationships are linear and additive; the data are interval level and come from a multivariate normal distribution. Further the model has to be identified.

If the initial model is rejected (as indicated by the values of the chi-square and t-tests) it can be modified in subsequent exploratory analyses by omitting nonsignificant paths or by introducing additional paths. These a posteriori attempts to improve the fit of the model lead to a capitalization on chance fluctuations in the sample. Cross validation on a new sample is then required to determine the stability of the final model. The description of latent variable causal modeling is not the focus of this paper and has been kept to a minimum. For an excellent introductory discussion of the state-of-the-art statistical model LISREL see J.S. Long (1976). More technical discussions can be found in K. Jöreskog (1979) and P. Bentler (1980).

Results

Figure 7–2 shows a recursive path model with standardized maximum likelihood estimates and their t-values between parentheses. Using a one-tailed test, a coefficient is significant at the $p = .05$ level if its t-value exceeds 1.658 with 117 degrees of freedom. The interpretation of the coefficients is directly analogous to ordinary regression or path coefficients. The overall chi-square of 287.9 (df = 241), p-level = .02, indicates that both the measurement model and the structural model yield a reasonable fit to the data. All coefficients are significant at the $p = .05$ level but one. A striking finding is the absence of a significant direct path from early conviction to later recidivism. Finally, the predictive value of the model with respect to recidivism is reflected in $R^2 = 1-.77 = .23$ (T = 6.41). The R^2 for age at first conviction is .36 (T = 6.23). The emphasis here is on the structural model path analysis. The factor analysis measurement model maximum likelihood estimates are shown in table 7–4.

One more step was taken: the one nonsignificant path was omitted and the model was re-estimated. The results are shown in figure 7–3. There are no substantial changes in the magnitude of the coefficients, the predictive power or the overall fit of the second model. It should be noted that the empirically tested theoretical model presented should still be validated in a new, larger sample. The model is presented to illustrate the fruitfulness of a confirmatory approach toward testing theoretical positions of the developmental processes underlying the genesis of criminal behavior. This technique allows researchers in criminology to apply theoretical modeling to nonexperimental data. At the same time, the researcher is forced to justify explicitly, on theoretical/empirical grounds, the proposed model.
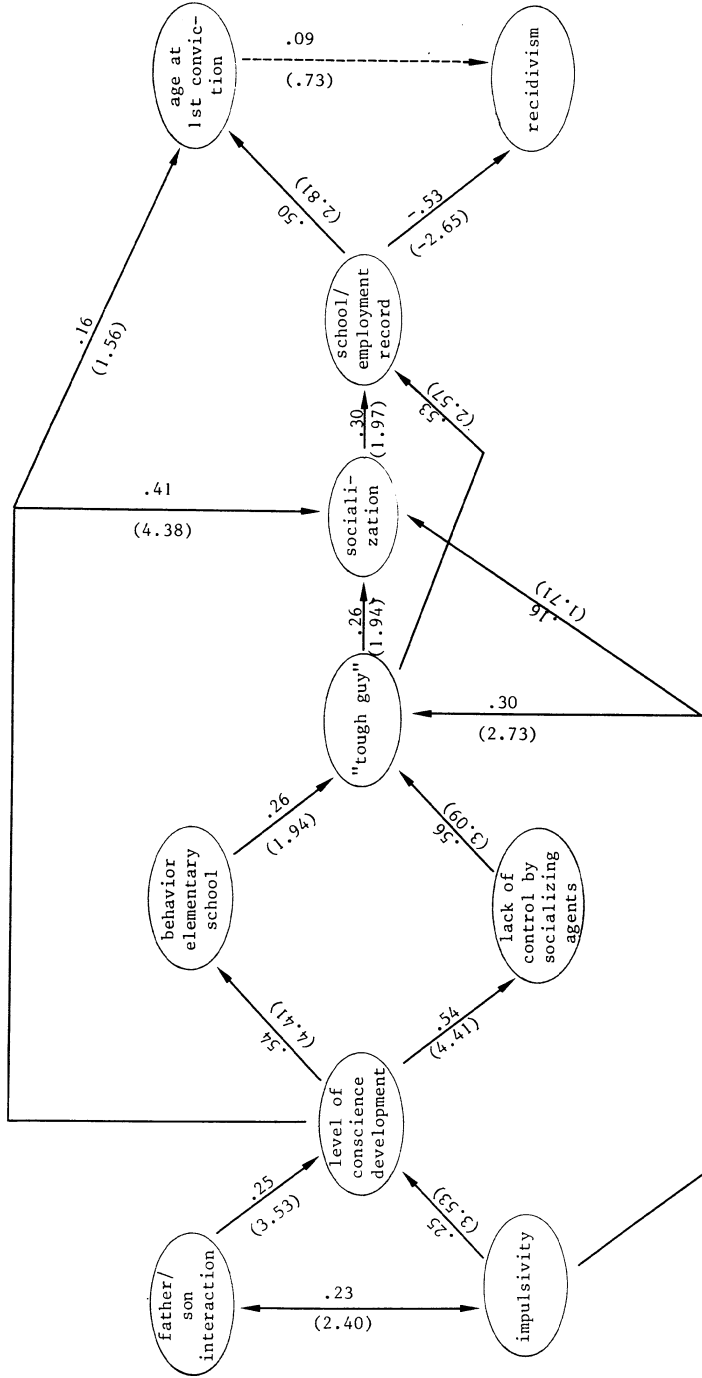
Figure 7-2. Observed empirical structural equation model I. Fit index: χ^2 (df = 241) = 287.9; p = .02

Discussion

Becoming delinquent is a process and should be studied as a process. In this paper we have presented a model in which recidivism is analyzed from a developmental point of view. Using a combination of quasi-longitudinal and longitudinal data we have tried to predict along which lines our subjects grow into a criminal career. This effort has been rather successful. The results of

Table 7–4. Standardised Maximum Likelihood Estimates of Measurement Model

*	Lambda[1]	Epsilon[2]	Observed indicators	Constructs
1	.84	.29	fairness	father–son
2	.67	.55	physical punishment	interaction
3	.82	.33	affection	in childhood
4	.52	.73	humor	
5	.63	.60	supervision	
6	.65	.58	help	
7	1.00**	.00	CPI self-control	impulsivity
8	1.00**	.00	CPI responsibility	conscience
9	.57	.64	behavior problems home	elementary school
10	.63	.64	behavior problems school	period
11	.42	.82	control by father	lack of control
12	.68	.55	truancy	by major socializing
13	−.33	.90	runaway	agents
14	.51	.73	bad friends	"tough guy" in
15	.70	.50	conflicts with police	adolescence
16	.51	.73	problems in neighborhood	
17	.66	.56	streetfighting	
18	.54	.70	frequenting bars	
19	1.00**	.00	CPI socialization	socialization
20	−.61	.62	job changes	school/work
21	.39	.85	educational level	history
22	.56	.69	employment level	
23	1.00**	.00	age at 1st conviction	early conviction
24	1.00**	.00	recidivism after parole	recidivism

*These numbers refer to figure 7–1.
**This parameter was fixed to unity during estimation (for sake of identification).
[1]Lambda is equivalent of a faktorloading.
[2]Epsilon is equivalent of measurement error and uniqueness variance; all estimates are significant at the $p = .05$ level.
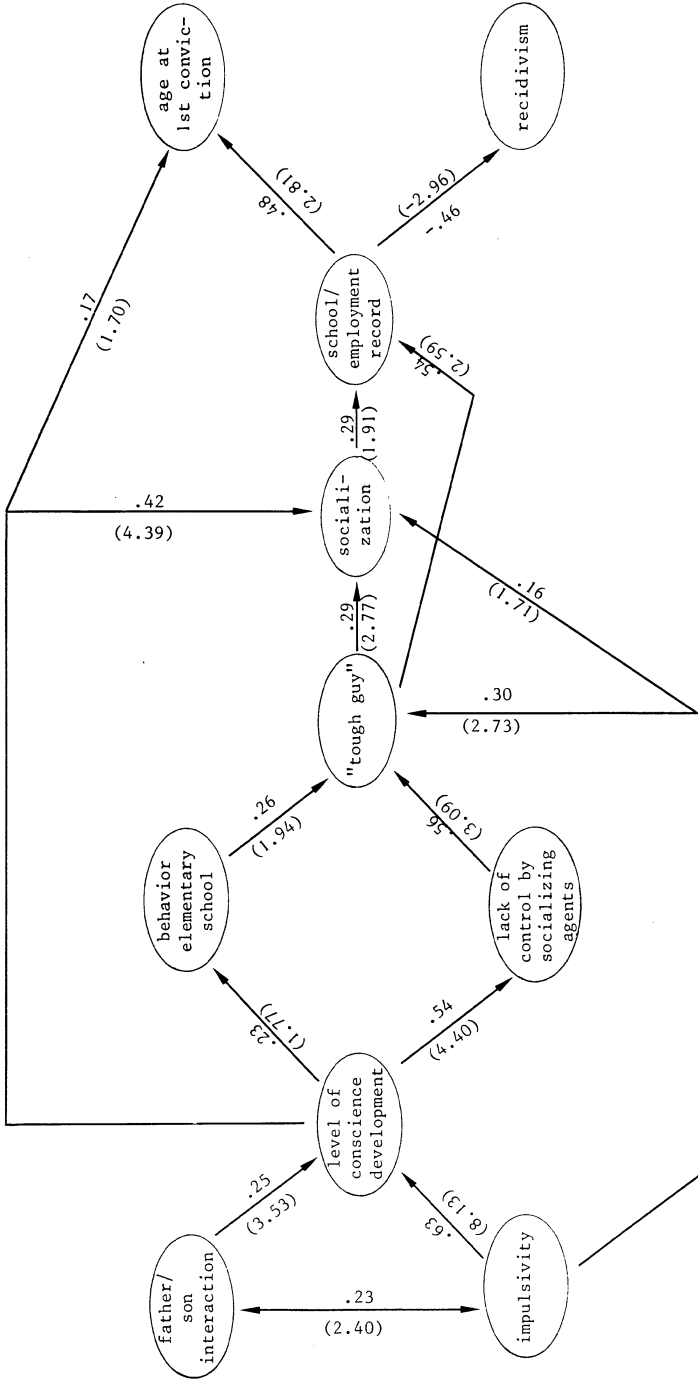
Figure 7–3. Observed empirical structural equation model II. Fit index: χ^2 (df = 242) = 288.4; p = .02

our path analysis are very satisfactory and this way of approaching the etiology of crime looks promising.

Our model illustrates the importance of a psychosocial approach. It is the interaction between individual traits and social factors which finally determines what becomes of our subjects. The model as it is presented does not contradict the value of existing criminological theories. On the contrary! Some of the paths predicted are based on these theories. Differential associations (Cressey, 1964) and the reactions to being deprived of an acceptable social status (Cohen, 1955), for instance, reflect themselves in the line we have drawn from behavior at the elementary school to the "tough guy" adolescent factor. Our model also shows that these reactions are not exclusively socially determined. Individual factors like impulsivity, a badly developed conscience, or factors on the meso level (lack of control by major socializing agents) play as important a role.

Indeed, what our model shows is that what counts is a combination of factors. For instance, socialization by itself is not related to the age at first conviction. It has its effect on becoming a criminal through the work and educational level of the subjects. To become delinquent, a combination of poor socialization and a bad school and work history is needed. The model can help us answer questions such as: why is it that the person (who is in the majority), possessing a trait which is related to crime (unemployment, low education, etc.), does not become criminal? Another interesting issue is that in our model no significant relationship exists between age at first conviction and recidivism. This is in contrast with what is usually found in prediction studies. There the age at which one is convicted is a very powerful predictor.

Our model indicates which factors really are relevant and why it is that at first sight early court contacts seem to be important. One final comment: The predominantly sociologically oriented studies of crime do not leave much room for individual traits to emerge as potential, relevant factors in the etiology of crime. For a long time psychological factors have been regarded as irrelevant. The conscience and the way it is built has attracted very little attention among criminologists. From this paper it may be concluded that these individual traits should not be neglected. Of course this is no plea for substituting the psychological approach for the sociological one. As we have indicated in the title of this paper, both approaches should be integrated as much as possible. We expect this to be an exciting "path."

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8 TESTING A GENERAL THEORY OF DEVIANT BEHAVIOR IN LONGITUDINAL PERSPECTIVE

Howard B. Kaplan and Cynthia Robbins

The following is a report of analyses testing models related to the adoption of deviant patterns. The models were derived from a previously formulated general theory of deviant behavior. Since the theory has been described in detail elsewhere (Kaplan, 1972, 1975b, 1980a, 1980c), only a brief overview will be presented here.

Theory

Within the context of a general theory, the various deviant behaviors are presented as alternative responses to self rejecting attitudes generated in the course of normative membership group experiences. As a theory of deviant behavior it applies only to response patterns which do not conform to the

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normative expectations of the person's predeviance membership group(s). The patterns can be traced to the loss of a previous motivation to conform, or from the development of a new motivation to deviate from normative expectations. Excluded from consideration are behaviors which, although defined as deviant by other groups, are compatible with the normative expectations of the subject's membership/reference groups. The theory would not be applicable in situations where, for example, marijuana use was nearly universally observed and/or approved (as on a college campus relatively isolated from extra college influences). Or where the behavior was highly compatible with other values (as where experimentation with illicit drugs in a slum youth social network is congruent with the valued attributes of toughness and adventuresomeness). Normative socialization or social learning theories would be more appropriate in these situations. Also excluded from consideration are instances of failure to conform to the expectations of others where the subject was motivated to conform but was unable to do so because of conflicting expectations or physical incapacity.

Underlying the theory is the postulate of the self esteem motive according to which people universally and characteristically are said to behave, so as to minimize the experience of negative self-attitudes and to maximize the experience of positive self attitudes. Self attitudes refer to the person's positive and negative emotional experiences upon perceiving and evaluating his or her own attributes and behavior.

Attitudes of self rejection are the end result of a history of membership group experiences whereby the subject was unable to defend against, adapt to, or cope with circumstances having self devaluing implications. These encompass a range of variables apparent in other theories including peer rejection, parental neglect, high expectations for achievement, school failure, physical stigmata, social stigmata (e.g., disvalued group memberships), impaired sex-role identity, ego deficiencies, low coping abilities, and coping mechanisms that are socially disvalued or otherwise self defeating. The likelihood of experiencing circumstances with self devaluing implications and/or failing to possess effective adoptive/coping/defensive patterns (which would forestall or assuage the experience of circumstances with self devaluing implications) is in turn influenced by complex patterns of interacting social (value system, available social support mechanisms, complexity of the social system, rate of social change, positions in the social system, etc.) and ontogenetic (including constitutionally given deficits) variables.

By virtue of the actual and subjective association between past member-

ship group experiences and the development of intensely distressful negative self attitudes, the person loses motivation to conform to, and becomes motivated to deviate from, membership group patterns. Simultaneously, the unfulfilled self esteem motive prompts the subject to seek alternative (that is, deviant) response patterns which offer hope of reducing the experience of negative (and increasing the experiences of positive) self attitudes. Thus, the person is motivated to seek and adopt deviant response patterns not only because of a loss of motivation to conform to the normative structure which has an earlier association with the genesis of negative self attitudes) but also because the deviant patterns represent the only motivationally acceptable alternatives that might serve self enhancing functions effectively.

Which of several deviant patterns is adopted, then, would be a function of the person's history of experiences influencing the visibility and subjective evaluation of the self enhancing/self devaluing potential of the pattern(s) in question. A particular drug use/abuse pattern is more likely to be adopted, for example, if, due to the greater availability of the drug, its use was more apparent among peers at school or in the neighborhood—that is, if the pattern was more visible. The subjective likelihood of self enhancing consequences of the behavior will reflect such variables as the subjectively perceived attitudes toward the illicit drug abuse pattern by members of positive and negative reference groups (peers, family, authority figures, school), the visibility of more or less prevalent adverse consequences of use of the illicit drug (arrest, loss of control, etc.), and the perceived compatibility of the consequences and concomitants of the drug abuse pattern with behavior appropriate to valued social roles.

Adoption of the deviant response has self enhancing consequences if it facilitates intrapsychic or interpersonal avoidance of self devaluing experiences associated with the predeviance membership group, serves to attack (symbolically or otherwise) the perceived basis of the person's self rejecting attitudes, and/or offers substitute patterns with self enhancing potential. To continue with the same example, avoidance functions might be served through the consequent rejection of the subject who adopted the drug abuse pattern by the normative membership groups in which the self rejecting attitudes were developed (resulting in decreased vulnerability to continuing self devaluing experiences), facilitating regressive return to a more dependent state (thus avoiding one's responsibilities and the risk of failure to carry them out), the pharmacologic effects of detachment or anesthetization of self punitive feelings, etc. Attacks upon the normative structure are symbolized by the illicit nature of the behavior pattern; and overt aggression might be

stimulated by particular psychoactive substances. Substitute gratifications may be provided by the deviant behavior, for instance identification with a community of users who accept the subject.

Method

The data to be reported below were drawn from an ongoing longitudinal study designed to test aspects of the general theory of deviant behavior outlined above. A 50 percent sample (N = 9,335) of the seventh grade students in the Houston Independent School District in 1971 responded to a self administered questionnaire during the school day in the Spring of that year (Time 1). A virtually identical questionnaire was administered to willing students who remained in school during the eighth and ninth grades during the Spring of 1972 (Time 2) and 1973 (Time 3) respectively.

Models

The following is a report of a series of multivariate logistic regression models of the adopting of each of a broad range of deviant patterns between the eighth and ninth grades. Self-reports in the ninth grade indicated the performance of the deviant act during the preceding year (or for alcohol use, during the preceding week), after having denied in the eighth grade the performance of the deviant pattern during the equivalent antecedent interval.

Independent Variables

The series of logistic regression models predicting the adoption of particular deviant patterns were estimated using eleven independent variables. The selection of the variables was suggested both by the previously formulated theoretical framework (Kaplan, 1972, 1975b, 1978b, 1980a, 1980c) and by a series of bivariate analyses the results of which were compatible with the theoretical framework (Kaplan, 1975a, 1975c, 1975d, 1976a, 1976b, 1976c, 1977a, 1977b, 1977c, 1978a, 1978b, 1978c, 1978d, 1979, 1980a, 1980b; Kaplan and Pokorny, 1976a, 1976b, 1976c, 1977, 1978). The independent variables variously reflected the self esteem motive (self derogation) "antecedents" of self derogation, and sequelae of self derogation.
    In the analyses to be reported below, the scores reflecting self derogation

and the putative antecedents of self derogation are based on data collected at the first test administration. The scores reflecting presumed sequelae of self derogation are expressed as residualized change scores between the first and second test administrations.

Self derogation.   Self attitude is viewed as a prime motivating force in predisposing a person to adopt deviant patterns. An intensely negative self attitude stimulates the need to attain, or restore acceptable levels of self esteem. Self derogation is measured by a seven item scale. Data on derivation, scoring, validity and reliability are presented elsewhere (Kaplan, 1976b, 1980a). The items comprising the scale are as follows. The responses indicated parenthetically reflect self derogation.

> I wish I could have more respect for myself (true)
> On the whole, I am satisfied with myself (false)
> I feel I do not have much to be proud of (true)
> I'm inclined to feel I'm a failure (true)
> I take a positive attitude toward myself (false)
> At times I think I'm no good at all (true)
> I certainly feel useless at times (true)

As the central concept in the theoretical formulation, the bivariate relationships between antecedent self derogation and subsequent reports of adoption of deviant responses were examined. The relationships were examined again in the context of a more complete model.

Antecedents of Self Derogation.   Self derogation is viewed, theoretically, as the outcome of a history of membership group experiences whereby the individual was unable to forestall or assuage the self devaluing implications of being rejected by significant others. Three variables were included in the model to reflect such antecedents of self derogation. These variables were perceived rejection by peers, perceived rejection in the family, and perceived rejection by the school. The description of the scales follows. Data regarding derivation and construct validity of the scales appear elsewhere (Kaplan, 1980a).

"Perceived rejection by peers" was measured as a count of "true" responses to the following items.

> More often than not I feel put down by the kids at school

I am not very good at the kinds of things the kids at school think are
important.
The kids at school are usually not very interested in what I do or
say.
Most of the kids at school do not like me very much.

"Perceived rejection by family" was a count of "true" responses to
the following items.

My parents hardly ever trust me to do something on my own.
At home I have been more unhappy than happy.
My family can't give me the chance to succeed that most kids
have.
I would like to leave home.
As long as I can remember my parents have put me down.
My parents are usually not very interested in what I say or do.
My parents do not like me very much.

"Perceived rejection by school" was a count of affirmative ("Yes or
true") responses to the following items.

Would you like to quit school as soon as possible?
My teachers are usually not very interested in what I say or do.
By my teachers' standards I am a failure.
My teachers do not like me very much.
I have never been very happy in school.
I probably will not go to college and graduate.
My teachers usually put me down.

The inclusion of these three predictors of self derogation in the full model
allows consideration of whether these sources of self derogation are uniquely
associated with the adoption of particular modes of deviance.

Sequelae of Self Derogation.   In the context of the general theoretical
model, self derogation was expected to have certain consequences which in
turn would predispose the person to adopt deviant responses.
First, it was expected that individuals characterized by negative self
attitudes would begin to perceive an association between their negative self
attitudes and their membership group experiences. Increased perception of
an association between negative self attitudes and membership group
experiences was measured by changes in the scores between the first and

second test administrations, on the first three variables described above as antecedents of self derogation. That is, subjects who between Time 1 and Time 2 increased their tendency to perceive themselves as being rejected by peers, family, and school, were understood to have increased in their own minds the association between actual early self devaluing experience on the one hand, and self derogation on the other hand.

As noted above, the scores reflecting presumed sequelae of self derogation are expressed as residual change scores between the first and second test administrations. A gain is said to be residualized "by expressing the posttest score as a deviation from the posttest-on-pretest regression line" (Cronbach and Furby, 1979:68). The effect of residualizing is to remove "from the posttest score, and hence from the gain, the portion that could have been predicted linearly from pretest status . . . The residualized score is primarily a way of singling out individuals who change more or less than expected" (Cronbach and Furby, 1979:74).

The use of residualized scores expresses the theoretical premise that some antecedent condition (here presumably self derogation) influences certain changes which in turn, and independent of initial scores on the variables, predispose a person to adopt any of a range of deviant patterns. Second, the general theoretical model under consideration states that, by virtue of the continuing failure of the normative structure to provide motivationally acceptable response patterns that would serve this need, persons charact-erized by negative self attitudes will experience intensification of the need to enhance their self attitudes. The intensification of the need is here said to be reflected in three phenomena: an increased experience of subjective distress associated with a vulnerability to self devaluing circumstances (that is, defenselessness); an increased predisposition to avoid personal respon-sibility for self devaluing circumstances particularly through the use of less than acceptable and frequently self defeating mechanisms; and a decreased tendency to employ more socially approved mechanisms toward the goal of avoiding blame.

An increase in "defenselessness" is reflected in changes between Time 1 and Time 2 in the number of affirmative responses to the following items:

Are you often bothered by nervousness?
Do you often get angry, annoyed or upset?
Do you often feel downcast and dejected?
Do you often have difficulty keeping your mind on things?
Do you have a lot of accidents?
Do you often have trouble sitting still for a long time?

Do you become deeply disturbed when someone laughs at you or blames you for something you have done wrong?
When my parents dislike something I do it bothers me very much.
When the kids at school dislike something I do it bothers me very much.
I get nervous when things aren't just right.
I spend a lot of time daydreaming.
When my teachers dislike something I do it bothers me very much.

These items may be thought of as falling into two subsets—those indicative of subjective distress, and those suggesting extreme sensitivity to negative attitudes expressed by others. Thus, a high score on this variable is understood to be indicative of "Defenselessness/Vulnerability" in the sense that the individual is apparently unable to reduce the experience of subjective distress associated with sensitivity to negative attitudes toward the subject expressed by others.

Residualized gains in the need to "avoid judgment of personal responsibility for self devaluing circumstances" were measured in terms of changes between Time 1 and Time 2 on scores derived in terms of the number of affirmative responses to the following items:

Are most of your friends older than you?
Do you often lose track of what you were thinking?
Do you tell lies often?
Do you try to avoid situations in which you have to compete with others?
It's mostly luck if one succeeds or fails.
I would like to travel with a circus or carnival.
You can do very little to change your life.
If someone insulted me I would probably avoid talking to him in the future.
When I do something wrong it's almost like it's someone else who is doing it, not me.
Often I feel that I don't have enough control over the direction my life is taking.
I don't care much about other people's feelings.
People often talk about me behind my back.

The avoidance of self judgments of personal responsibility for wrongdoing or failure might be accomplished through the disavowal of personal, as opposed to external, control over one's behavior and outcomes, emotional detachment that precludes the experience of self blame, interpersonal

avoidance of situations characterized by risks of self devaluation and/or denial of reality.

This measure appears to encompass the two patterns of protective attitudes identified by Washburn (1962). The "Self-Other Distortion" pattern was said to involve the defenses of projection, displacement of hostility, substitution, and conversion. The "Reality-Rejection" pattern included suppression, regression, withdrawal, and negativism. Washburn (1962:89) reported a correlation of r = .28 between measures of these two patterns for a grouping of 100 high school students, thus suggesting a common underlying factor (here interpreted as avoidance of judgments of personal responsibility).

The decreased tendency to employ more socially acceptable mechanisms toward the goal of avoiding blame is reflected in a measure of "guilt deflection" after Washburn (1962, p. 88), who described this pattern of self-protective attitudes as "an attempt to avoid blame and maintain the experience of conforming to socially approved standards of behavior." Guilt deflection was inversely related to nonconformance and involved such defenses as rationalization, reaction formation, and compensation. The index was here interpreted broadly as the use of socially acceptable mechanisms to forestall or reduce the experience of self rejecting feelings. From the nature of the factor structure it would appear that much the same mechanisms were reflected in the component items as were said to be involved in Washburn's guilt-deflection cluster. The items comprising the measure were as follows:

By the time I am 30 I will probably have a good job and a good future ahead of me.

If someone insulted me I would probably figure, "Who cares what he thinks."

If someone insulted me I would probably figure it was his own problems that made him do it.

When things aren't going too well for me I try to think that things will be better in the future.

If someone insulted me I would probably joke about it.

I usually like to have friends with me when I go somewhere new.

If someone insulted me I would probably try to forget about it.

When I do something wrong I usually admit it and take my punishment.

When things are going wrong for me, I try to think of my strong points and my past successes.

Does your memory seem to be all right (good)?

I do what I think is right even when I'm criticized for it.

I know what I want out of life.

The items reflect a number of socially acceptable patterns through which the person may redefine the situation so as to mitigate its self-devaluing implications. Notable among the patterns are compensation by reference to future (By the time I am 30 I will probably have a good job and a good future ahead of me.) and past accomplishments (When things are going wrong for me, I try to think of my strong points and past successes.) The desire to have friends along in novel experiences may reflect a similar attempt to balance possibly self devaluing experiences with positive social support. Other patterns include expiation (When I do something wrong I usually admit it and take my punishment); attribution of fault to characteristics of the source rather than the self (If someone insulted me I would probably figure it was his own problems that made him do it); and minimization of the significance of the source or the event in response to personal insult (I would probably figure, 'Who cares what he thinks' . . . , I would probably try to joke about it . . . , I would probably try to forget it).

Finally, the general theoretical model states that highly self rejecting individuals, in view of the inability to satisfy the self esteem motive through the use of normative response patterns, will seek and become aware of alternative deviant response patterns. Change in this regard is reflected by relative increases between Time 1 and Time 2 in "awareness of deviant alternatives" beyond that which could have been predicted linearly from knowledge of Time 1 scores. Subject "awareness of deviant responses" was measured by the number of "yes" responses to the items below. The "deviant" acts were a representative sample of the more inclusive set of behaviors under investigation in the first series of analyses.

Do many of the kids at school take an active part in social protest either at school or outside of school?

Do many of the kids at school take narcotic drugs?

Do many of the kids at school damage or destroy public or private property on purpose that doesn't belong to them?

Do many of the kids at school break into and enter a home, store or building?

Do many of the kids at school carry razors, switchblades, or guns as weapons?

Do many of the kids at school take little things (worth less than $2) that don't belong to them?

Do many of the kids at school beat up on people who have not done anything to them?

Do many of the kids at school smoke marijuana?

In sum, within the context of a general theoretical model, a number of variables are said to be sequelae of self derogation. These changes are increased tendencies to view normative membership groups as sources of self rejecting attitudes, decreased motivation to conform to normative expectations, increased need to enhance self attitudes, and increased awareness of deviant responses.

These sequelae of self derogation are hypothesized to specify the relationships between self derogation and deviant behavior observed in earlier bivariate analyses (Kaplan, 1980a). To the extent that the residual gain scores explain the self-drogation-deviance relationship, positive and significant coefficients for self-derogation in bivariate predictions of deviant behaviors should be reduced or disappear when these more proximal and direct causes of deviant behavior are included in the prediction equation. Earlier analyses produced relationships between self derogation and the residual gain scores that are consistent with these specification predictions (Kaplan 1975c, 1980a).

The data were treated by multiple logistic function analysis using maximum likelihood estimation procedures (Hanuschek and Jackson, 1977; Nerlove and Press, 1973). As used in the present study this procedure estimates the probability (P) of adopting (versus not adopting) a particular deviant response as a function of the set of eleven independent variables (X_1 to X_{11}) described above. The models are fitted in the following form where the dependent variable is the log of the conditional odds (or logit) of P:

$$\ln(P/1 - P) = B_0 + B_1 X_1 + \ldots, B_{11} X_{11}$$

Thus,

$$P = 1/(1 + e^{(-B_0 - B_1 X_1 - \ldots, B_{11} X_{11})}$$

The use of logistic regression is appropriate where, as in the present instance, the dependent variables are dichotomous and are characterized by severely skewed distributions.

Results

The equations predicting adoption of deviant responses are presented in Table 8–1. The logistic coefficients and constants are presented for each deviant pattern. The top part of the table presents the full model with all 11 independent variables. The bottom part of the table presents the bivariate relationships between self derogation and subsequent adoption of deviant responses. Statistical significance tests are based on t-ratios for the logistic

Table 8-1. Multiple Logistic Coefficients for Antecedents of Adopting Deviant Behavior Between 1972 and 1973

	Stole things worth between $2 and $50	*Suspended or expelled from school*	*Took things worth less than $2*	*Thought about or threatened to take own life*	*Came in contact with police, sheriff or juvenile officers*
A. Full Model					
Self derogation 1971	−.002	.000	.001	.009**	−.004
Felt rejection by peers 1971	−.120*	−.163*	−.028	−.036	−.183**
Felt rejection by family 1971	.004	.070	.101*	.119*	.085
Felt rejection by school 1971	.262**	.256**	.172**	.082	.255**
Residualized gain in defenselessness 1971–1972	−.052	.001	−.047	.021	−.064*
Residualized gain in avoidance of personal responsibility 1971-1972	.050	.021	.083*	.174**	.072
Residualized gain in awareness of deviant alternatives 1971–1972	.083*	.015	.146**	.019	.064*
Residualized gain in felt rejection by peers 1971–1972	−.081	−.050	.050	−.037	−.034
Residualized gain in felt rejection by family 1971–1972	.094	−.002	.012	.070	.068
Residualized gain in felt rejection by school 1971–1972	.186**	.209**	.165**	.075	.237**
Residualized gain in guilt-deflection 1971–1972	−.031	.024	−.049	−.022	−.028
Constant	−2.652	−3.076	−2.148	−2.758	−2.533
N[a]	2,399	2,482	2,009	2,166	2,446

Became angry and broke things	Carried a razor, Switch-blade or gun as a weapon	Sold illegal drugs	Received a failing grade in one or more subjects	Used wine, beer or liquor more than two times	Cheated on exams	Smoked marijuana	Took part in a strike, riot or demon-stration
−.006*	−.007*	−.001	.001	.001	.001	.001	−.003
.044	.127*	−.197**	−.017	−.121*	−.051	−.112*	−.018
.043	−.019	.043	.100*	−.015	−.008	.072	−.009
.135**	.257**	.308**	.182**	.209**	.201**	.175**	.184**
.035	−.028	−.001	−.034	.046*	.110**	−.029	−.010
−.009	.067	.053	.099**	−.020	−.001	.030	.103*
.056*	.081*	.126**	.052*	.107**	.051*	.080**	.057
−.064	−.037	−.096	−.002	−.091	−.030	−.070	.037
.077	.010	.066	.086*	.095*	−.006	.142**	−.001
.014	.168**	.167**	.140**	.209**	.083*	.147**	.074
−.067**	−.019	−.063	.025	−.007	−.008	−.055**	−.068
−1.667	−2.757	−3.058	−1.924	−1.566	−.994	−1.775	−2.896
1,850	2,396	2,547	1,994	2,041	1,584	2,290	2,477

Table 8–1 *(continued)*

	Stole things worth between $2 and $50	*Suspended or expelled from school*	*Took things worth less than $2*	*Thought about or threatened to take own life*	*Came in contact with police, sheriff or juvenile officers*
Proportion affirming deviant response	.08	.06	.14	.10	.08
B. Bivariate					
Self derogation 1971	.005*	.006*	.008*	.014*	.003
Constant	−1.449	−2.961	−2.172	−2.780	−2.466
N	2,727	2,825	2,279	2,472	2,786
Proportion affirming deviant response	.08	.06	.14	.10	.09

Table 8–1 (continued). Multiple Logistic Coefficients for Antecedents of Adopting Deviant Behavior Between 1972 and 1973

	Attempted Suicide	*Started a fistfight*	*Took narcotic drugs*	*Skipped school without an excuse*	*Took an active part in social protest in or out of school*	*Took part in gang fights*	*Was sent to psychiatrist, psychologist, or social worker*
A. Full Model							
Self derogation 1971	.007*	−.004	.000	−.004*	−.010**	−.004	.001
Felt rejection by peers 1971	−.079	.058	−.213**	−.030	−.060	−.026	−.028
Felt rejection by family 1971	.155**	.121*	.103*	.004	.119*	.116*	.190*

Became angry and broke things	Carried a razor, Switch-blade or gun as a weapon	Sold illegal drugs	Received a failing grade in one or more subjects	Used wine, beer or liquor more than two times	Cheated on exams	Smoked marijuana	Took part in a strike, riot or demon-stration
.16	.08	.06	.16	.19	.30	.17	.06
.001	.002	.007**	.006**	.003	.005**	.006*	.003
−1.704	−2.565	−2.988	−1.852	−1.582	−1.022	−1.822	−2.895
2,094	2,715	2,880	2,241	2,320	1,784	2,581	2,786
.16	.08	.06	.16	.19	.30	.17	.06

Used force to get money or valuables	Broke into and entered a home, store or building	Damaged or destroyed public or private property on purpose	Was taken to the office for punishment	Took things from someone else's desk or locker	Took a car for a ride without the owner's permission	Beat up someone for no reason at all	Stole things worth $50. or more
.004	−.008*	−.005	.002	.002	.003	−.001	−.002
−.016	−.123	.078	−.056	−.060	−.106	.008	−.022
.044	.104	.074	.027	.023	−.029	.112*	.052

Table 8–1 *(continued)*

	Attempted Suicide	Started a fistfight	Took narcotic drugs	Skipped school without an excuse	Took an active part in social protest in or out of school	Took part in gang fights	Was sent to psychiatrist, psychologist, or social worker
Felt rejection by school 1971	.052	.099*	.266**	.179**	.288**	.132*	.020
Residualized gain in defenselessness 1971–1972	.126**	−.039	.031	.028	−.043	−.054	.007
Residualized gain in avoidance of personal responsibility 1971–1972	.186**	.054	.059	.011	.070	−.022	.140*
Residualized gain in awareness of deviant alternatives 1971–1972	.008	.075*	.075*	.052*	.040	.079*	.063
Residualized gain in felt rejection by peers 1971-1972	−.140	−.001	−.115*	−.141*	−.113	.321**	−.032
Residualized gain in felt rejection by family 1971–1972	.070	.025	.129**	.120**	.114*	−.058	−.017
Residualized gain in felt rejection by school 1971–1972	.128*	.118*	.158**	.233**	.139**	.155**	.121

Used force to get money or valuables	Broke into and entered a home, store or building	Damaged or destroyed public or private property on purpose	Was taken to the office for punishment	Took things from someone else's desk or locker	Took a car for a ride without the owner's permission	Beat up someone for no reason at all	Stole things worth $50. or more
.132*	.236**	.080	.227**	.195**	.211**	.051	.174**
−.061	−.056	−.046	−.031	−.005	−.060	.001	−.056
.120*	.158**	.083	.051	−.038	.095*	.094*	.064
.147**	.097*	.144**	.008	.105**	.045	.068	.046
.142	.055	.131*	.097	−.021	.131*	.118	.111
−.028	.024	.071	.037	.026	−.046	.013	.031
.148*	.070	.038	.232**	.124*	.209**	.107*	.151*

Table 8-1 *(continued)*

	Attempted Suicide	*Started a fistfight*	*Took narcotic drugs*	*Skipped school without an excuse*	*Took an active part in social protest in or out of school*	*Took part in gang fights*	*Was sent to psychiatrist, psychologist, or social worker*
school 1971-1972							
Residualized gain in guilt-deflection 1971-1972	−.047	−.057	−.039	−.074*	.036	.016	−.004
Constant	−3.292	−2.478	−2.282	−1.620	−2.600	−2.993	−3.688
N	2,438	2,245	2,391	2,205	2,300	2,480	2,535
Proportion affirming deviant response	.06	.09	.12	.17	.08	.06	.03
B. Bivariate							
Self derogation	.011**	.004	.007**	.003	.002	.003	.010*
Constant	−3.238	−2.444	−2.268	−1.711	−2.526	−2.961	−3.711
N	2,772	2,532	2,687	2,508	2,602	2,799	2,854
Proportion affirming deviant response	.06	.09	.12	.17	.08	.06	.04

function coefficients. Since the direction of relationships was specified in each instance in the general theoretical model one-tailed tests of significance are applied.

The series of equations under consideration predict the probabilities of adopting deviant responses between the eighth and ninth grades (between Time 2 and Time 3) as indicated by self-reports at Time 3, of having performed the deviant act during the preceding year (or, in the case of alcohol use, during the preceding week). All subjects who at Time 2 affirmed

Used force to get money or valuables	Broke into and entered a home, store or building	Damaged or destroyed public or private property on purpose	Was taken to the office for punishment	Took things from someone else's desk or locker	Took a car for a ride without the owner's permission	Beat up someone for no reason at all	Stole things worth $50. or more
−.093*	−.105*	−.125**	−.021	−.082*	−.111**	−.053	−.111*
−3.452	−3.297	−2.805	−1.953	−2.566	−2.871	−2.909	−3.404
2,532	2,539	2,413	1,878	2,321	2,518	2,435	2,576
.05	.04	.06	.16	.09	.07	.06	.04
.010**	.003	.003	.009**	.009**	.007**	.004	.007*
−3.357	−3.284	−2.812	−2.028	−2.578	−2.893	−2.821	−3.441
2,862	2,862	2,713	2,117	2,615	2,836	2,759	2,896
.05	.04	.06	.16	.10	.07	.06	.04

(*p ≤ .05, **p ≤ .01)
[a]Number of respondents who completed 1971, 1972 and 1973 questionnaires with complete data on all variables in the model and who did not affirm the deviant response on the 1972 questionnaire.

performing the deviant act during the preceding year (or, in the case of alcohol use, during the preceding week) were excluded from the analysis. Thus, the self-reports of deviant acts as well as the time periods to which the reports referred followed in time the independent variables which were Time 1 measures or measures of residualized gains between Time 1 and 2.

The analyses comprising the series of models were accomplished using subjects who were present for all of the first three test administrations, who

did not report performing the deviant act prior to Time 3, and for whom data on all relevant variables were available. The number of cases used in each of the analyses are presented in table 8–1.

Data regarding the deviant nature of the items and the validity of self-reports are presented elsewhere (Kaplan, 1976b, 1980a). The twenty-eight items are as follows.

Took things worth between $2 and $50.
Was suspended or expelled from school.
Took things worth less than $2.
Thought about or threatened to take your own life.
Came in contact with police, sheriff or juvenile authorities.
Became angry and broke things.
Carried a razor, switchblade or gun as a weapon.
Sold narcotic drugs (dope, heroin).
Received a failing grade in one or more school subjects.
Used wine, beer or liquor more than two times.
Cheated on exams.
Attempted suicide.
Started a fist fight.
Took narcotic drugs.
Skipped school without an excuse.
Took part in social protest.
Took part in gang fights.
Was sent to a psychiatrist, psychologist or social worker.
Used force to get money or valuables.
Broke into and entered a home, store, or building.
Damaged or destroyed public or private property on purpose.
Was taken to the office for punishment.
Stole things from someone else's desk or locker.
Used a car without the owner's permission.
Beat up someone who did nothing to you.
Took things worth $50 or more.
Smoked marijuana.
Took part in strikes, riot or demonstration.

The full and bivariate logistic models predicting adoption of each of the 28 deviant responses are presented in table 8–1.

Self Derogation and Deviant Reponses

Bivariate Models.   The bivariate equations presented in the bottom part of table 8–1 reveal a consistent positive relationship between self-derogation and subsequent adoption of deviant responses. For each pattern of deviant behavior higher degrees of self derogation at T1 were associated with greater probability of adopting the deviant response between T2 and T3 (as reported at T3). The relationship was statistically significant at the $p \leq .01$ level for thirteen of the patterns and at the $p \leq .05$ level for an additional three deviant patterns. The deviant patterns that were significantly associated with antecedent self derogation include theft in a variety of contexts, suicidal ideation and attempts, engaging in drug traffic, illicit narcotic and marijuana use, difficulties in school (failing course, being sent to the office, cheating on exams, suspended from school), stealing a car, and stealing with the use of force. Those relationships that did not reach significant levels tended to be those that had higher apparent negative outcomes. Since self derogation is likely to be associated with feelings of low self efficacy the self rejecting subject would not be likely to feel capable of forestalling such negative outcomes and the expectations of such would mitigate the otherwise theoretically expected association between self-derogation and the adoption of the deviant responses. This interpretation is congruent with the observed relationships between self-derogation and deviant responses in the context of the full models (part A, table 8–1).

Full Models.   Here, after the associations between self derogation and its putative antecedents or consequences are taken into account, self derogation remains positively and significantly associated with subsequent adoption of deviant responses in only two instances—those of suicidal ideation and suicidal attempts. Consistent with the reasoning advanced immediately above, the relationship became negative in fourteen instances. That is, higher degrees of self derogation were associated with a lower probability of subsequent adoption of the deviant response. The negative relationship was statistically significant in five instances (one at the $p \leq .01$ level). Generally these instances of deviant responses tended to be those that had high apparent risk of adverse consequences: carrying a weapon, starting a fist fight, breaking and entering, getting angry and breaking things, skipping school, and participating in a social protest.

   Thus the pattern of bivariate and full model data suggest that self-derogation has implications for the adoption of deviant responses in two different ways. First self derogation, deriving from past self-devaluing

experiences in normative membership groups, and operating through its theoretically indicated and empirically substantiated sequelae, predisposes the subject to adopt any of a range of deviant patterns which offer promise of self enhancing consequences. Second, self derogation associated as it is with low levels of self confidence and perceived self efficacy, causes the person to hesitate to adopt deviant patterns with a high risk of adverse consequences.

Felt Rejection by Family, Peers, and School. For all but one of the deviant patterns, at least one of the felt rejections was significantly associated with the subsequent adoption of the deviant response. By far the most consistent predictor of subsequent deviant responses from among the felt rejection measures was felt rejection by the school. Higher levels of felt rejection by the school at T1 were related to greater probability of subsequently adopting deviant responses between T2 and T3. The relationship was in the predicted direction for all 28 deviant patterns. The relationship was significant for 23 of the patterns (20 at the $p \leq .01$ level, 3 at the $p \leq .05$ level). Thus, among the selected sources of self rejection, the experience of self devaluing circumstances in the school was most likely to anticipate adoption of deviant responses at least over the short term and for subjects who remained in school during the junior high school years.

Felt rejection by the family, while not as pervasive in its apparent effects upon the adoption of deviant responses, was related in the predicted direction to the adoption of each of 23 deviant patterns. Only ten of the coefficients were significant (2 at the $p \leq .01$ level, 8 at the $p \leq .05$ level). Six of these patterns relate either to peer-directed (starting a fist fight, participating in gang fights, beating up someone) or self-directed (taking narcotics, suicidal ideation, suicide attempts) aggression. One of the remaining patterns, being sent to a psychiatrist or other helping resource, may well be associated with such peer-oriented or suicidal responses. The remaining significant coefficients related to petty theft, social protest, and failing one or more subjects. This pattern of significant associations suggests that the family as a source of self rejection may be uniquely associated with the adoption of deviant patterns characterized by the manifest expression of aggression toward targets (peers, self) other than the family. At least this may be the case at this time of life when the family may not easily become the target (albeit an appropriate one) of aggression.

Although the following results were anticipated somewhat by the bivariate analysis of the relationship between felt rejection by peers and subsequent adoption of deviant responses (Kaplan, 1980a) as well as by theoretical considerations and empirical reports of the relationship between peer

influence and deviant behavior, it is still perhaps surprising how consistent the inverse relationship between self rejection by peers and subsequent adoption of deviant responses was observed to be in the full models. After controlling for any effects on the adoption of deviant responses shared with other independent variables, felt rejection by peers is inversely related to the subsequent adoption of 23 deviant patterns. Subjects who were less likely to indicate felt rejection by peers at T1 were more likely to subsequently adopt the deviant pattern. The relationship was significant in seven instances (3 at the $p \leq .01$ level, and 4 at the .05 level). Four of the patterns concerned substance abuse (selling drugs, using narcotic drugs, alcohol use more than 2 times during the previous week, smoking marijuana) thus suggesting the social significance of these patterns or the need for peers to provide the substance and the setting for the performance of the act. Similarly, another significant relationship concerned stealing items worth between 2 and 50 dollars which may have been done with the cooperation of peers. The other significant relationships concerned being suspended from school and coming to the attention of the police. These variables may well reflect the visibility of the peer activities as well as the fact of their occurrence.

At this age, at least, deviant activity apparently requires a viable peer context. After taking into account any tendency of felt rejection by peers to dispose a person to adopt deviant responses by increasing self derogation, it becomes apparent that alienation from peers inhibits the adoption of deviant response.

Felt rejection by peers was positively and significantly ($p \leq .05$) related to the subsequent adoption of only one deviant pattern—carrying weapons, an observation that perhaps requires no further comment.

Sequelae of Self Derogation.   We turn now to the seven variables included in the model as reflecting sequelae of self derogation and, thus, as hypothetical influences upon the adoption of deviant behaviors. These variables, it will be recalled, are expressed as residualized gain scores— change from T1 to T2 net of the effect that could be predicted linearly from knowledge of the T1 scores.

Three of these scores parallel the T1 felt rejections just discussed— residual gain between T1 and T2 in felt rejection by peers, by family, and by school. Thus, it is possible to examine the effects of both initial levels of felt rejection and, independent of initial levels, changes in felt rejection upon subsequent adoption of deviant responses.

Since individuals were said to develop self derogation in the course of their membership group experiences, it was expected that self rejecting persons

would increasingly perceive themselves as being rejected by the groups. The increased felt rejection in turn would predict the adoption of deviant responses. Generally these expectations were rewarded. For 23 of the deviant patterns adoption of the deviant act was related to increases in at least one of these three variables.

As with the relationship between the initial felt rejection measures and deviant behavior, residual gain in felt rejection by the school was the most consistent predictor of adoption of deviant responses. Residual increases in this variable between T1 and T2, independent of the effects of any other independent variables with which it might have been correlated, were positively associated with the subsequent adoption of each of the 28 deviant patterns. The relationships were significant for 22 of the patterns (15 at the $p \le .01$ level, 7 at the $p \le .05$ level).

Residual gain in felt rejection by the family was also generally related to the subsequent adoption of deviant patterns. Higher residual gains between T1 and T2 in felt rejection by the family were related to increased likelihood of subsequently adopting 21 of the deviant patterns. However only 6 of these relationships were significant (3 at the $p \le .01$ level, 3 at the $p \le .05$ level). The significant relationships concerned the adoption of substance abuse patterns (alcohol, narcotics, and marijuana use), rejection of school authority (skip school, fail one or more courses), and participating in social protest. The general pattern suggests oppositional behavior oriented toward more inclusive (and presumably family supported) values. While initial levels of felt rejection by the family at T1 were related to deviant patterns including self and peer directed aggression, as if to the exclusion of aggression directed toward family supported social values, the increased awareness of (or the increased willingness to admit) the role of the family in the genesis of rejection between T1 and T2 appears to foreshadow deviant patterns interpretable as subtle or not so subtle opposition to family endorsed social values.

Consistent with the analyses presented above regarding the relationship between level of felt peer rejection at T1 and adoption of deviant patterns between T2 and T3, more often than not, residual gain in felt rejection by peers was associated with a lower probability of adopting the deviant pattern. This inverse relationship was observed for 18 of the deviant patterns. However only two of the relationships were statistically significant, both at the $p \le .05$ level (taking narcotic drugs, skipping school). Apparently for numerous deviant patterns, the behavior is occasioned or facilitated by viable peer relationships. However for 10 of the patterns, deviant behavior is anticipated by residual increases between T1 and T2 in felt rejection by peers. Three of the relationships were significant (one at the $p \le .01$ level,

2 at the $p \leq .05$ level). These patterns suggest that increases in felt rejection by peers (the kids at school) lead to aggressive responses directed toward the source and/or setting of the felt rejection (gang fights, vandalism, taking a car without the owner's permission).

The general theory specifies a further general consequence of self derogation which should predispose the subject to adopt deviant patterns. Persons characterized by negative self attitudes are theorized to experience three outcomes: an increased experience of subjective distress associated with a vulnerability to self devaluing circumstances (that is, defenselessness); an increased predisposition to avoid personal responsibility for self devaluing circumstances through the use of ineffective or deviant response patterns; and a decreased tendency to employ more socially approved mechanisms toward the goal of avoiding blame.

In short, the residual changes in the three variables said to reflect the intensification of the self esteem motive should predict adoption of deviant responses as alternatives to the normative response patterns that have proved to be ineffective in this regard. Increases in defenselessness and avoidance of personal responsibility for self devaluing circumstances (through the use of ineffective or disapproved patterns), and decreases in guilt deflection (reflecting the use of more socially approved mechanisms toward the goal of forestalling or reducing the experience of self rejecting feelings) were expected to anticipate the adoption of deviant responses.

As anticipated, an increased tendency to avoid personal responsibility for self devaluing circumstances was positively associated with a broad range of deviant patterns. The relationship was in the predicted direction for 23 of the deviant patterns. Of these 10 were significant (4 at $p \leq .01$ level, 6 at $p \leq .05$ level). None of the five negative relationships were significant.

Also as anticipated, decreases in guilt deflection between T1 and T2 generally foreshadowed the adoption of a range of deviant responses between T2 and T3. The relationship was in the predicted direction for 24 of the 28 deviant patterns, although only 9 of the relationships were statistically significant (4 at the $p \leq .01$ level, 5 at the $p \leq .05$ level). These serve well to illustrate the effects of decreased use of socially acceptable mechanisms for dealing with self devaluing circumstances (getting angry and breaking things, using marijuana, skipping school, using force to rob a person, breaking and entering, vandalism, taking things from a desk or locker, joyriding, grand theft).

While the increased tendency to employ unacceptable mechanisms generally anticipated the adoption of deviant responses, the expected general relationship between increased defenselessness and subsequent adoption of deviant responses was not observed. Residual gain in defenselessness was

positively related to only 10 of the deviant patterns, and of these only 3 of the relationships were statistically significant (2 at the $p \leq .01$ level). One of these (attempted suicide) may be thought of as a direct expression of an increase in felt defenselessness while the others (cheating on exams and using alcohol) appear to be relatively prevalent low risk responses. In contrast, relative increase in defenselessness was inversely related to the adoption of 18 of the deviant responses. Greater increases in defenselessness were associated with lower probabilities of adopting the deviant responses. Apparently after controlling for the effects of self derogation, and antecedents or sequelae of self derogation with which defenselessness might be correlated, this variable has an independent and negative effect on the adoption of deviant patterns.

The nature of this effect is suggested both by the composition of the sample and the nature of the measure of defenselessness. Regarding the sample, the subjects were those who remained in school and in the study for all three data collections. Thus, it may be presumed that their personal outcomes are tied to the normative order. Regarding the measure, defenselessness has two component measures of subjective distress which might suggest a sensitivity to adverse outcomes, and a felt vulnerability to negative sanctions of others, so the defenseless subject would tend to be inhibited from performing acts that are at high risk for eliciting negative sanctions from others. This explanation is congruent with the observation that the significant ($p \leq .05$) inverse relationship involves a relatively high risk activity with regard to visibility of the act and probable severity of sanction (contact with police). Conversely, a relative decrease in felt defenselessness would suggest an attenuation of social relationships with agents of social controls, and a consequent decrease in inhibition of impulses to perform deviant acts.

Finally, it was expected that increased awareness of deviant alternatives in the environment would anticipate the adoption of the deviant response patterns. As expected, increased awareness of deviant responses was positively related to subsequent adoption of each of the 28 deviant patterns. Of the 28 positive relationships, 18 were statistically significant (7 at the $p \leq .01$ level, 11 at the $p \leq .05$ level).

Summary and Conclusion

The generality of a model accounting for the adoption of a range of deviant response patterns was tested using multiple logistic function analysis. The components of the model were derived from a general theory of deviant behavior. The elements of the model were: the central concept of self

derogation, specified antecedents of self derogation, and specified sequelae of self derogation, eleven independent variables in all. Four of the variables were scores at T1, and seven of the variables were expressed as residualized gains between T1 and T2. The outcome variables were self-reports at T3 with regard to performance of each of 28 deviant acts between T2 and T3 (after having denied performance of the act between T1 and T2).

Bivariate analyses of the relationship between self derogation at T1 and subsequent adoption of deviant responses supported the expectation that self rejecting attitudes are a general antecedent of multiple modes of deviant responses. As expected the relationship was transformed in the context of the full model containing as it did the correlates of self derogation which were expected to anticipate the adoption of deviant response patterns. In effect, controlling for the disposition to adopt deviant patterns resulting from the genesis of self derogation in the context of normative membership groups, the inhibitory effects of self-derogation upon the adoption of deviant patterns are revealed. In the context of the full model, perhaps operating through such correlates of self derogation as low sense of self efficacy and sensitivity to adverse outcomes, self derogation becomes inversely related to the adoption of a number of deviant patterns, particularly those that appear to have a high risk of adverse outcomes for the subject.

Regarding the putative antecedents of self derogation as having effects upon the adoption of deviant responses, such deviant responses are generally anticipated by high felt rejection by the school and high felt rejection by the family, measured at T1. Perceived rejection by peers, after controlling for any positive relationship with the adoption of deviant responses attributable to its correlates in the full model, is observed generally to be inversely related with few exceptions to the adoption of deviant patterns. This suggests that viable peer relationships provide the occasion and/or resources for adopting several deviant responses. In the near term, at least, subjects who feel alienated from their peers are less likely to subsequently adopt such peer dependent patterns.

Regarding the theoretical sequelae of self derogation that were anticipated to have general effects upon the adoption of self derogation, increased awareness between T1 and T2 of the school and the family as sources of self rejection were generally and positively related to the subsequent adoption of deviant responses. Increased awareness of rejection by peers tended to be positively and significantly related to those specific patterns which reflected aggressive responses against peers or against the environment (the school) in which peer rejection occurred. Generally, though, residual gain in felt rejection by peers tended to be inversely related to the adoption of deviant responses. Again, this suggests that viable peer relationships provide the

occasion and/or resource for many forms of deviant behavior; and alienation from peers, thus, inhibits the adoption of such responses.

Generally an increased tendency to employ disapproved or immature mechanisms and a decreased tendency to use more socially acceptable mechanisms to forestall or diminish the experience of self rejecting feelings anticipated the adoption of the range of deviant responses. Contrary to expectations, however, increased defenselessness/vulnerability tended to be inversely related to the adoption of deviant responses. This suggests that after any positive effects upon deviance this variable may have had are controlled by virtue of its correlation with other variables in the model, increases in felt vulnerability to adverse outcomes (including negative sanctions from valued others) inhibits the adoption of deviant patterns.

Finally, increased awareness of deviant alternatives in the environment, as expected, increased the likelihood of adopting each of the deviant patterns. The structure of the findings are conditioned, of course, by the nature of the sample (junior high school students who remained in the same school between the seventh and ninth grades) and the dependent variables (initial adoption of the deviant acts between the eighth and ninth grades). As these conditions change, correlates of these conditions would be expected to render the model more or less viable. Nevertheless, within these conditions the number of components that have general independent effects with regard to the adoption of a wide range of deviant behaviors suggests that the general theory of deviant behavior from which these elements of the model were derived is a promising one for guiding research on the common elements accounting for the adoption of a wide range of deviant response patterns.

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9 DELINQUENCY AMONG METROPOLITAN BOYS: A PROGRESS REPORT

Carl-Gunnar Janson

The Problem

This is a study of juvenile delinquency. All data are taken from the Swedish Project Metropolitan, which is a longitudinal study of a Stockholm cohort. In the analyses, juvenile delinquency is the dependent variable, treated as a function of social and sociopsychological variables.

At least two perspectives can be taken. First, one can focus on differential life chances, i.e. on consequences for the individuals of their belonging to one or the other social category. In this study the social consequence in question is the risk of becoming delinquent. For instance, an analysis could show that for boys from unskilled-worker families the risk of becoming known by the police as a delinquent between age 15 and 18 was almost four times the risk for boys from upper middle class families. In this way one may give a picture of what it meant to be in the various social categories. In several tables rates of delinquency are provided for various social categories, so that the life-chance perspective can be applied, if one so wishes.

However, the main perspective of the study is not that of differential life-chances but one of variance partitioning. The variance of the dependent variable can be partitioned as a component of variation between categories

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and a component of variation within categories. Or, if regression analysis is used, variance can be partitioned into a component due to variation in regressors and a residual component. The closer the set of independent variables are to important aspects of the mechanisms behind the dependent variable, the greater proportion the between-categories component (or the component accounted for by the set of regressors) will be, given measurement errors, the number of categories, and the distribution of individuals over the set of regressors. For each analysis the percent variance accounted for by the set of independent variables is calculated. This is the study's main statistic, to which most comments are devoted.

The main purpose of this study is to give a rough estimate of the extent to which early social position and some personal characteristics can account for juvenile delinquency. The question is asked whether in a given cohort these structural and sociopsychological variables account for an essential part of the juvenile delinquency variation between cohort members or whether they play only a minor role. (In most analyses only the delinquency of boys is considered.)

It is well-known that the correlation between social position and delinquency is controversial among sociologists. Recently the notion of a correlation between social class and criminality has been called a "myth" (Tittle, Villemez & Smith, 1978). Yet it seems to be generally taken for granted by sociologists that recorded juvenile delinquency is unevenly distributed among social classes, even if the opinions may differ as to the strength of the correlation. Similarly, delinquency is assumed to be correlated with some other structural variables, such as race. Correlations are also claimed for various personal adaptive resources and attitudes, but here not all would agree on the same set of correlates. (An excellent overview on the textbook level is given by Nettler, 1978, especially chs. 7 and 8.)

The mechanisms connecting the structural and sociopsychological variables with delinquency are often left implicit. Here they are outlined as follows. Ordinary, "traditional" property crimes, crimes of violence, and vandalism, i.e. direct–contact violations, which constitute the bulk of juvenile criminal acts require the convergence in space and time of three elements:

> "Each successfully completed violation minimally requires an *offender* with both criminal inclinations and the ability to carry out those inclinations, a person or object providing a suitable *target* for the offender, and *absence of guardians* capable of preventing violations" (Cohen and Felson, 1979:590).

The probability that a given boy will commit a direct-contact criminal act within a given period of time depends, first, on the extent to which he is a

willing and able perpetrator in situations where there are suitable targets without adequate guardians. Here one should include the extent to which he tends to see situations as containing appropriate, insufficiently guarded targets. Secondly, the probability of the boy committing a direct-contact violation depends on the frequency by which unprotected potential targets are available to him. The willing and able offender may have a partiality for such tempting situations.

The boy's willingness and ability as a violator is assumed to be a function of a set of attitudes to norms and norm-breaking, and of a set of social and sociopsychological resources; each set essentially moulded in the course that the socialization process has taken for the boy. It is part of the conventional sociological wisdom that the social position and composition of the boy's family of orientation condition the socialization process both within the family and in other interactions (for a review, see Martens, 1981:76–84, 101–107, 127–144). Some personal characteristics similarly can be assumed to condition the socialization process but also partially to be outcomes of this process. Even to the extent that the likelihood of dangerous situations is not dependent on the boy's willingness and ability as a violator, it is assumed to be partially a function of social position and some personal qualities. Hence, a correlation is expected between delinquency on the one side and social position and composition of the family of orientation and some individual adaptive resources and attitudes on the other.

Design

The first analyses concern school behavior, both self-reported and recorded. Only in this part girls are included, whereas all the other sections, which deal with delinquency, refer to boys (and sometimes to young adult males also), since the male delinquency was assumed to be more reliably measured. In these analyses officially known delinquency is intended rather than delinquent behavior, and "delinquent" is hereby defined as a person known by the police for criminal behavior. This choice is based on three reasons. The first is a generally sceptical attitude toward survey self-reports on deviant behavior.

In practice, and within the limits of available resources, if not in principle, self-reported delinquency does not appear to provide more valid information than official records on the somewhat more serious delinquent acts than the most minor misdemeanor that traditionally dominate the self-reports. The self-report validity may in itself be impressive, considering the

difficulties, but leaves room for bias just as with records. Generally, "asking people questions about their behavior is a poor way of observing it" (Nettler, 1978:107), especially when using retrospective questions concerning deviant behavior and getting more nonresponse than heavy deviants. Police reports certainly have their shortcomings, but compared to the ordinary self-report survey they have the advantage to this study of tapping a domain of somewhat less trivial violations (Hindelang, Hirschi and Weis, 1979), as the risk to get recorded depends not only on visibility but also on gravity and frequency of violations (Elliott and Ageton, 1980), although most recorded violations are not very serious. Furthermore, one may reasonably expect most of the alleged weaknesses of American police records to be less prevalent with the politically less sensitive Scandinavian police, with a cohort containing few members of easily discernible minority groups and few slum dwellers, and with a city structure of mostly heterogeneous neighborhoods. (For a discussion of police records, see Persson, 1980.) Project Metropolitan has not attempted to get self-reports on crime.

Secondly, to the extent self-reports and police records give different results, records can be expected to yield stronger correlations with socioeconomic variables. Since rather low correlations were anticipated as the main result of the study, it seemed important to be able to forestall a possible objection that the correlations were artificially lowered by the use of self-report data. Thirdly, in looking at the impact on delinquency by parental social position and early personal characteristics, the part of delinquency that might influence filial social position by getting societal attention seemed especially interesting. Evidently the second and third reasons do not build on the first one.

Two sets of independent variables were selected. The first set should measure the structural family factors that conditioned the relevant aspects of the socialization process. Social class, defined by occupation, at two periods in time was supplemented by three problem indicators for two periods: dependency, parental felony sentences, and Child Welfare Committee cases due to family conditions. Income and higher education were not used, since they would not differentiate much further among the problem families. There was also a division into single-parent families and complete families and some use of delivery data. The second set of independent variables consisted of individual characteristics, presumably conditioning the socialization process as well as being outcomes of this process. They were, first, adaptive resources, such as mental ability and marks, and, second, orientations and attitudes, such as educational plans, attitudes toward school, and conceptions of the future. Here variables were included in some analyses somewhat generously, again in order to be able to counter a possible objection that

correlations were unnecessarily weakened because important regressors were left out.

The statistical analyses consist of cross-tabulations, the calculation of coefficients of correlation (gamma, phi, and product-moment), a covariance analysis, and series of multiple-regression analyses. For all analyses the proportion of variance accounted for is given, either directly or indirectly through its square root, the phi or product-moment coefficient. It may be noticed that the individual characteristics are cross-tabulated with social class, and that they are inserted in the regression equations after the family variables. This is because the family variables are considered in some sense more basic than the individual variables. When the characteristic is tabulated against social class, its contribution to variance without controlling for social class is also calculated. In the regression analyses the contribution of the individual characteristics to the variance without family variables is not given. Evidently, it cannot be greater than the combined contribution of individual characteristics and family variables (if one does not adjust for lost degrees of freedom).

Project Metropolitan

The Swedish Project Metropolitan is, like its Danish counterpart, a longitudinal study of a cohort. The cohort is defined as all boys and girls born in 1953 and registered as living in the Stockholm Metropolitan Area on November 1, 1963. The number of cohort members is 15,117, of whom 7,719 are boys and 7,398 are girls.

The project has three major fields of interest: social stratification and social mobility, deviance, and mate selection and procreation. The study started in 1964. Data are collected continuously, and until recently the data gathering process has taken almost all the time and resources available within the project. The process is planned to go on until the year the cohort members become 30, i.e. 1983, is covered. In 1975 a series of reports was started. Until now 20 reports have been published. They include presentations, code books, and reports on studies within the project.

A major goal of the project is to describe the cohort member's family of orientation, especially those aspects of the family's social position and interaction patterns which are assumed to influence the behavior and attitudes of the cohort member. The subject's behavior, attributes, and attitudes within the project's fields of interest as well as the ensuing social position are similarly recorded. Since family interaction and member's behavior are not directly observed, indirect indicators are used. A rather

broad theoretical approach is taken, since both theories and methods can change considerably over twenty years.

The records cover the first thirty years of the lives of the cohort members. At any given time within this period of observation, variables concerning the family of orientation are assumed to make a synchronous causal structure but also to be influenced by previous states and conditions. Corresponding assumptions are made as to variables concerning individual characteristics. In addition, both synchronous influences from aspects of the family of orientation and diachronous influences from previous family states and conditions are expected. A further set of influences would go from cohort-member aspects to family aspects synchronously and diachronously. Generally those influences are taken to be weaker than those going in the opposite direction, i.e. from family to member. Certainly children's behavior and attributes can influence parents' attitudes and behavior, but most family variables recorded in the project concern socioeconomic position, family structure, and parental behavior usually less influenced by the children. The child's sex and school achievement however, can be expected to influence the parents' expectations as to the child's future and their interest in and attitudes to the child's education.

The general approach is described in figure 9–1, in which the period of observation for convenience has been divided into four sub-periods.

The data sets collected by the project and the points or periods of time they refer to are shown in figure 9–2. As can be seen, the project relies heavily on the population registration system and other governmental micro data. The whole project is based on the possibility, given by the registration system, of determining who the cohort members are and then keeping track of them as long as they stay within the country. The project also relies on the system of governmental micro data to get most of its information concerning the families of orientation and the cohort members. In fact, until now, the project has carried out only two surveys. First, the School Study in 1966, when the cohort members filled out two questionnaires in class, and then the Family Study in 1968, when a stratified sample of 4,000 mothers were interviewed. All data not from these surveys are governmental data, either directly transferred from tape or manually excerpted from files. It should be noted, however, that two sets of governmental micro data stem from surveys of a scale the project could not afford. The first is the set of data on the households to which the cohort members belonged in 1960. This set comes from the 1960 Census of Population and Housing, i.e. from a questionnaire study. The second is the data set from the screenings at the military induction of the male members of the cohort. Here the inductees are examined

FAMILY OF ORIENTATION   CHARACTERISTICS &
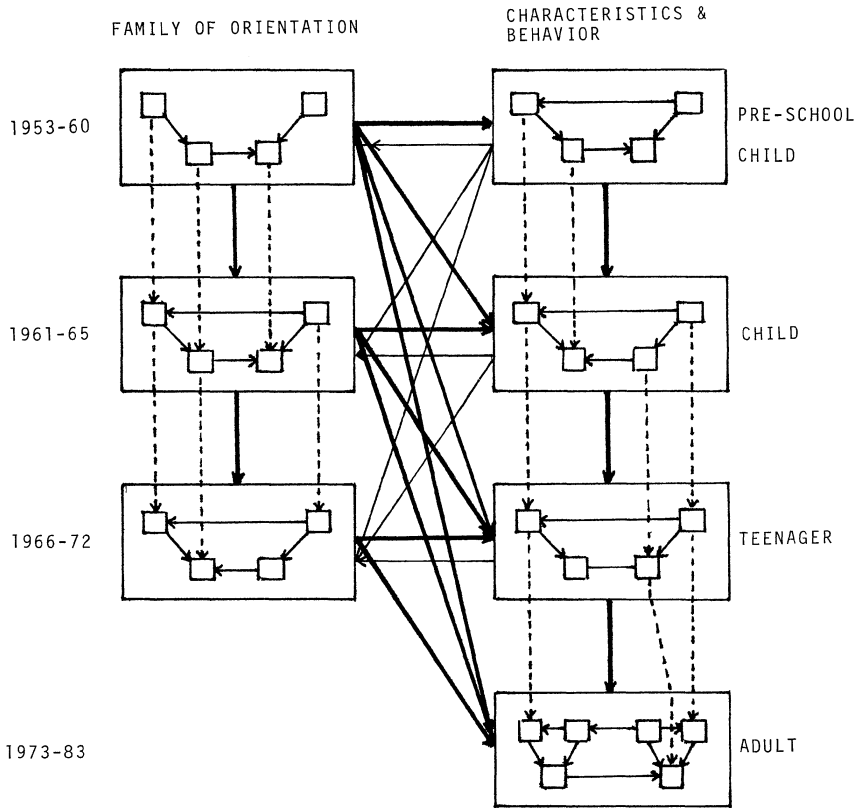   BEHAVIOR

Figure 9-1. General Approach of Project Metropolitan

physically, fill out questionnaires, and take various tests in a procedure that takes two days.

We hope to collect additional data for the remaining part of the period of observation, e.g. continuing the series on income and that on crime, and getting data on college and university attendance.

Self-Reported School Behavior

In the project the study of deviant behavior so far has essentially been focused on juvenile delinquency. The project has no data on self-reported

Diagram 2   Project Metropolitan's Data

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Year					
1953	Delivery Records	Birth Place Social Class of Parents	Dependency Cases Child Welfare Committee (Including Delinquency Cases)	Criminal Record of Family Head	Address
1954					
1955					
1956					
1957					
1958					
1959					
1960	Census of Population & Housing				
1961					
1962					
1963	Definition of Population	Family Social Class			Address Head of Family Income
1964				Exit	
1965					
1966	School Study	Marks,Sixth Form		Police Record	Address
1967					Address Head of Family
1968	Family Study Sample			Application for Gymnasium and Fackskola	
1969		Marks,Ninth Form			
1970	Family Composition		Attendance and Marks of Gymnasium and Fackskola		
1971	Draft Board Data(Boys)				Address Head of Family Income
1972					
1973					
1974					Address Income
1975					
1976					
1977					
1978					Address Family Income
1979					
1980					
1981	Sick-leaves, early retirement pensions				
1982					
1983					

For Cases: Changes in Family Composition

Figure 9–2. Project Metropolitan's Data

delinquency. To get the cooperation of school authorities and the PTA in the School Study we agreed not to ask about sex life and delinquency. As we thought self-reports on delinquency would only be moderately useful in providing indicators of early differential and substantial delinquency, we gladly consented to the condition. Instead we used the available question-naire space for questions on school, school regulations, and conceptions of the future.

Only two questions related to deviant behavior were included in the 1966 questionnaire: "Have you stayed home from school though you were not ill?" (No / Yes, once or twice / Yes, several times), and "Have you ever been sent out of class for something you did?" (No / Yes, once or twice / Yes, several times). When they were run against social class in 1963 table 9–1 resulted.

As seen in table 9–1, boys and girls do not differ a great deal in their answers to the first question but showed a clear difference in responses to the second one. There is little difference between social classes among the boys but a slight tendency for upper middle class girls to report that they stayed home more often (possibly with the consent of the parents) and were sent out of class more often. In both questions the upper middle class girls were more similar to the boys than were the working class girls. Here the self-reports turned out to be distributed according to sex and social class in combination in a way that reflects variations in sex roles, as in answers on questions on leisure activity[1], more than it reflects differences in officially known delinquency, where, of course, upper middle class girls show no tendency to be more delinquent than working class girls.

However, the answers have some validity as indicators of truancy and breaking regulations at school. When the self-reports are compared with school records from sixth form as to absence without excuse and marks of conduct, respectively, self-reports are strongly related to recorded absences without excuse and to recorded marks of conduct. Of course, perfect correlations cannot be expected. For one thing, the official criteria are much severer than the self-reports, as can be expected in a fairly permissive system. It should be pointed out that marks and absences in sixth form were not available for schools outside the Stockholm area, for those classes in the area which either did not record marks or absences, or whose records could not be found, due to administrative changes etc. Marks and absences in ninth form were missing for the corresponding categories of pupils as well as for those who left school after eighth form.

In any case, among boys with no recorded absences without excuse in sixth form only 4.3 percent said they had stayed home several times, whereas among the few boys who had such recorded absences 22.5 percent admitted

Table 9–1. Self-reports (in 1966) of being absent without being ill and of being sent out of class, by sex and social class

| | "Have you ever stayed home without being ill?" | | | | | | | |
| | Boys | | | | Girls | | | |
Social class, 1963	Never	Once or twice	Several times	n	Never	Once or twice	Several times	n
Upper middle	65.6	29.9	4.5	1,116	69.1	27.4	3.5	1,122
Lower middle, empl.	68.3	27.0	4.7	2,339	73.2	23.7	3.1	2,280
Lower middle, entrep.	60.7	34.5	4.8	498	73.9	22.0	4.1	536
Skilled workers	67.1	29.4	3.5	1,489	74.4	24.2	1.4	1,469
Unskilled workers	65.2	28.6	6.2	1,088	75.5	22.8	1.7	1,023
Unclassified	49.7	39.2	11.1	181	64.3	33.6	2.1	143
Total	66.0	29.2	4.8	6,711	73.0	24.4	2.6	6,573

"Have you ever been sent out of class for something you did?"

Social class, 1963	Boys				Girls			
	Never	Once or twice	Several times	n	Never	Once or twice	Several times	n
Upper middle	26.2	54.7	19.1	1,129	58.2	34.5	7.3	1,132
Lower middle, empl.	25.0	53.8	21.2	2,351	63.0	31.4	5.6	2,284
Lower middle, entrep.	23.9	52.2	23.9	502	63.1	33.2	3.7	540
Skilled workers	26.7	51.2	22.1	1,501	63.4	31.8	4.8	1,467
Unskilled workers	24.9	53.2	21.9	1,103	65.8	29.6	4.6	1,033
Unclassified	18.7	55.5	25.8	182	63.2	31.2	5.6	144
Total	25.3	53.2	21.5	6,768	62.7	31.9	5.4	6,600

Note. In the tables percentages are given only when based on at least 50 cases in the denominator. If the number of cases in the denominator is between 50 and 99, the percentage is shown within parentheses.

staying home often. Only 20.7 percent of the boys with a good mark of conduct reported being sent out of class several times, whereas half of the few boys with a poor mark gave that answer. These differences make for high gamma-coefficients: 0.67 and 0.71 for boys, 0.56 and 0.85 for girls, for truancy and conduct, respectively. However, the corresponding phi-coefficients are low: 0.12 and 0.10 for truancy, 0.05 and 0.08 for conduct.

School Behavior and Delinquency

Both self-reported and officially recorded school behavior also are related to recorded delinquency[2], as can be seen from tables 9–2 to 9–4. As above, the associations are strong or fairly strong when measured by gamma-coefficients, whereas the phi-coefficients are low. For each delinquency variable both gamma and phi are higher for the officially recorded school behavior than for the self-reported behavior.

The tables illustrate the well-known association between delinquency and adaptive problems at school. However, although even primitive classifications such as those in the tables can identify high risk categories, these categories are small, so that only a tiny proportion of the delinquency variance is accounted for, as shown by the low phi-coefficients. This may be due, partially at least, to insensitive measures, but here the burden of proof stays with the researcher. Similarly, getting a poor mark of conduct is somewhat less rare for working class boys than for middle class boys. In the five social classes of table 9–1, the percentages of boys with poor marks of conduct in sixth form are 0.5, 1.7, 1.4, 2.6, and 3.8, respectively (and 3.0 percent in the nonclassified category). This gives a gamma of 0.35 but accounts for only 0.5 percent of the variance in marks.

This follows a familiar pattern when one looks for background factors in the family of orientation and for early indicators of attributes and behavior. When examining a set of possible early indicators of delinquent tendencies the usual outcome is that some, but not all, of the variables have a clear association with delinquency but cannot account for much of the variance in delinquency. Combinations of variables will, of course, do better but not so much that they will change the general picture.

Family of Orientation

To start from the beginning, aspects of delivery as excerpted from the delivery records generally showed little variation between socioeconomic

Table 9–2. Percent boys known to the police according to self-reported school behavior

Known to the police	Stayed home without being ill				Sent out of class			
	Never, once or twice $n = 6,388$	Several times $n = 323$	Coefficient of association gamma	phi	Never, once or twice $n = 5,314$	Several times $n = 1,454$	Coefficient of association gamma	phi
Before age 15								
one or more acts	9.2	22.0	0.47	0.09	8.5	14.8	0.30	0.09
two or more acts	3.7	12.4	0.57	0.09	3.5	6.3	0.48	0.13
Between 15 and 18								
one or more acts	11.7	30.7	0.54	0.12	10.7	19.7	0.34	0.11
two or more acts	7.6	22.9	0.57	0.12	7.0	13.4	0.35	0.10

Table 9–3. Percent boys known to the police according to marks of conduct in sixth form.

	Marks of Conduct in sixth form		Coefficient of association	
Known to the police	Good n = 6,746	Not good n = 144	gamma	phi
Before age 15				
one or more acts	9.4	45.8	0.78	0.17
two or more acts	3.7	27.8	0.82	0.21
Between 15 and 18				
one or more acts	12.2	47.2	0.73	0.15
two or more acts	7.8	38.2	0.76	0.16
Between 18 and 21				
one or more acts	13.1	44.4	0.68	0.13
two or more acts	7.7	37.5	0.76	0.20
Until July, 1979				
one or more acts	29.7	80.6	0.82	0.16
two or more acts	18.6	59.4	0.82	0.18
four or more acts	8.2	47.9	0.81	0.19
Until July, 1979				
one or more acts of violence	6.0	31.3	0.75	0.15
two or more acts of violence	2.3	19.4	0.82	0.15

Note: The mark of conduct in sixth form is not recorded for 829 boys. Delinquent acts were recorded from 1966.

categories and even less relation to delinquency variables. For instance, working-class babies tended to be somewhat smaller than upper middle class babies, but there was no clear association between weight at birth and becoming a juvenile delinquent. The exception to this general lack of association found so far refers to estimated length of pregnancy. In the period 1953–59 15.9 percent of the families went on welfare at least once, and 9.6 percent of the cohort members became a Child Welfare Committee cases due to family conditions. But if the estimated length of pregnancy was less than 253 days, these percentages were 24.0 and 16.7, respectively, and if the estimated length was at least 308 days, they were 24.3 and 14.5, respectively. No increased probability to become delinquent was found for boys born too early, but the percentage of future delinquents was higher for those born too late. Among boys born in the area 10.6% are known by the police as delinquents[3] before they reached the age of 15, but for 123 boys

Table 9–4. Percent boys known to the police according to absence without excuse in sixth and ninth forms.

Known to the police	Absent without excuse, sixth form				Absent without excuse, ninth form			
	No n = 6,515	Yes n = 191	gamma	phi	No n = 5,531	Yes n = 363	gamma	phi
Before age 15								
one or more acts	9.6	40.8	0.73	0.17	8.2	27.0	0.61	0.16
two or more acts	3.8	28.3	0.82	0.20	2.9	15.2	0.71	0.16
Between 15 and 18								
one or more acts	12.4	39.3	0.64	0.13	9.5	42.7	0.75	0.25
two or more acts	8.1	30.4	0.66	0.13	5.8	30.3	0.75	0.23
Until July, 1979								
one or more acts	30.0	67.0	0.65	0.13	26.9	68.6	0.71	0.22
two or more acts	18.8	58.6	0.72	0.17	15.7	53.7	0.72	0.24
six or more acts	7.5	37.7	0.76	0.18	5.6	28.7	0.74	0.22

Note: Absence without excuse was not recorded for 1,013 boys in sixth form and for 1,825 boys in ninth form.

delivered after a pregnancy of at least 308 days this percentage was 19.5 (gamma = 0.35, phi = 0.04). As to delinquency between 15 and 18 years of age the corresponding percentages are 13.2 and 22.8 (gamma = 0.33, phi = 0.04) and as to delinquency till July, 1979, they are 31.0 and 43.1 respectively (gamma = 0.24, phi = 0.04). Since estimated length of pregnancy so far is the only delivery variable found to be associated with socioeconomic variables, its meaning may be social rather than medical, e.g. reflect increased difficulty to estimate length of pregnancy in some problem families and a relative inability to take action when delivery is overdue.

Birth order and number of siblings have not yet been explored. However, it can be reported that 12 percent of 158 male cohort members known by the police as heavy drug addicts as against 3 percent in the whole cohort were borne by teenage mothers (gamma = 0.69, phi = 0.08). Then, presumably, the percentage of first borns is also higher than average among the drug addicts.

As expected, officially known juvenile delinquency varies with the socioeconomic position of the family of orientation. Tables 9–5 and 9–6 show the distribution of delinquency before the age of 15 according to social class in 1953, family head's registered criminality before 1960, and years on welfare 1953–59. Both tables refer to boys born in the metropolitan area. Social class and the dichotomy whether or not the family head was convicted for a felony before 1960 are associated gamma = 0.33. Social class accounts for 1.7 percent of the variance of the felony-conviction dichotomy. Social class has gamma = 0.21 with delinquency before age 15 and accounts for 0.8 percent of the variance, whereas years on welfare gets gamma = 0.41 and accounts for 1.9 of the delinquency variance. For the felony dichotomy the corresponding figures are gamma = 0.39 and 0.9 percent of the variance (phi = 0.10). Social class and family head's felony conviction together "explain" 1.6 percent of the delinquency variance, and for social class and years on welfare considered together the part of the delinquency variance is 2.4. Finally, if all these classifications are combined, the variance accounted for is 3.0 percent[4].

Corresponding tabulations and calculations can also be made for recorded delinquency in other periods and with family characteristics from the period 1960-65: social class in 1963, family head's felony sentences in 1960-65, and dependency 1960-65. Generally, delinquency between 15 and 18 years of age and total delinquency 1966–July, 1979, tend to be somewhat more strongly associated with the social background variables. Furthermore, the delinquency variables can be redefined so as to require at least two known delinquent acts in the period. When this was done for delinquency before the

Table 9–5. Percent family heads in felony register before 1960, according to social class in 1953; percent boys delinquent before age 15, according to social class and criminality of family head

| Social class, 1953 | Percent family head in felony register, 1959 | Percent delinquents before age 15 | | | |
| | | Family head in felony reg. 1959 | | | |
		No	Yes	Total	n
Upper middle	3.6	6.2	—	6.2	801
Lower middle, empl.	6.1	8.3	16.7	8.8	1,975
Lower middle, entrep.	10.2	8.1	—	8.6	372
Skilled workers	10.0	11.6	20.2	12.5	1,786
Unskilled workers	14.9	12.5	26.0	14.5	1,187
Unclassified	—	—	—	—	45
Total	8.9	9.8	19.9	10.7	6,166

Note: Table refers to 6,166 boys born in the metropolitan area.

Table 9–6. Percent boys delinquent before the age of 15, according to social class in 1953 and dependency 1953–59

| Social class, 1953 | Family on welfare 1953–59 | | | |
	Not on welfare	One or two years	3–7 years	Total
Upper middle	6.4	—	—	6.2
Lower middle, employees	7.9	10.2	23.5	8.8
Lower middle, entrepreneurs	8.0	—	—	8.6
Skilled workers	10.5	16.9	22.5	12.5
Unskilled workers	10.9	20.9	26.3	14.5
Unclassified	—	—	—	—
Total	8.9	15.5	23.8	10.7

Note: "Years on welfare" means number of years the family is recorded as receiving certain kinds of monetary support at least once.

age of 15, the variances accounted for were somewhat higher than for the original delinquency definition.

Tables 9–7 and 9–8 correspond to tables 9–5 and 9–6 but refer to the social background in 1960–1965 and to delinquency between 15 and 18 years of age. Social class in 1963 and the head of the family being found in the felony register for 1960–65 are related with gamma = 0.40, with social class accounting for 1.6 percent of the felony dichotomy. The felony variable associates gamma = 0.41 and phi = 0.09 with delinquency, accounting for 0.7 percent of the delinquency variance. For years on welfare the figures are gamma = 0.48 and 2.3 percent. For social class and the felony dichotomy combined, the percent variance accounted for is 2.8 percent, for social class and dependency combined, it is 3.8 percent, and for all three variables combined, the percentage is 4.3. Social class alone accounts for 2.3 percent of the delinquency variance.

Table 9–9 shows the relation between early dependency and number of known delinquent acts in three periods. It also gives the relationship between number of acts and the dichotomy of whether or not the boy was a case for the Child Welfare Committee, due to family conditions, in 1953–59. If the

Table 9–7. Percent family heads in felony register 1960–65, according to social class in 1963; percent boys delinquent between 15 and 18 years of age according to social class and criminality of family head

| | | Percent delinquents 15–18 years of age | | | |
| | | Family head in felony reg. 1960–65 | | | |
	Percent family head in felony register, 1960–65	No	Yes	Total	n
Upper middle	1.2	5.3	—	5.7	1,295
Lower middle, empl.	4.0	9.9	22.6	10.4	2,679
Lower middle, entrep.	6.3	12.1	—	12.4	555
Skilled workers	5.9	16.8	(23.2)	17.2	1,685
Unskilled workers	10.3	19.5	31.5	20.7	1,265
Unclassified	10.9	21.2	—	21.7	240
Total	5.4	12.6	25.4	13.3	7,719

Note: Table refers to 6,166 boys born in the metropolitan area.

delinquency variables in the table are treated as interval scales with two and three equal steps, respectively, then the variance component between dependency categories is 2.8 percent, 2.7 percent, and 4.2 percent, respectively, of each total delinquency variance. The corresponding components between categories for the Child Welfare Committee dichotomy are 1.5 percent, 1.7 percent, and 2.0 percent, respectively.

Individual Characteristics

Among individual variables taken from the School Study or school records, marks of conduct and absence without excuse have already been used. Now mental test scores, plans for higher education, and average marks in sixth form are considered. All observations on the first two variables and most observations on the third variable refer to 1966.

The mental test has three subtests. The first is verbal, the second spatial, and the third numerical. Each has 40 items. The combined score varies with social class. The variance component between classes is 8.8 percent for the boys. Table 9–10 gives percent boys known by the police between 15 and 18 according to test score totally and within each social class. The delinquency variance component between test score intervals is 3.3 percent, whereas test score and social class together contribute 4.5 percent. (The expected random

Table 9–8. Percent boys delinquent between 15 and 18 years of age, according to social class in 1963 and dependency 1960–65

	Family on welfare 1960–65			
Social class, 1963	Not on welfare	One or two years	3–6 years	Total
Upper middle	5.7	—	—	5.7
Lower middle, employees	9.1	23.7	(34.4)	10.4
Lower middle, entrepreneurs	11.9	—	—	12.4
Skilled workers	15.5	26.7	(29.5)	17.2
Unskilled workers	18.2	29.8	31.9	20.7
Unclassified	15.5	—	(28.2)	21.7
Total	11.5	26.0	30.1	13.3

Note: "Years on welfare" means number of years the family is recorded as receiving certain kinds of monetary support at least once.

Table 9–9. Delinquency distributions according to years on welfare and Child Welfare Committee cases 1953–59, for boys.

Number of years on welfare 1953–59	Number of delinquent acts										
	Until 15 years of age			15–18 years of age				Until July, 1979			
	0	*1*	*2 or more*	*0*	*1*	*2–4*	*5 or more*	*0*	*1*	*2–4*	*5 or more*
0 (n = 5,284)	91.1	5.5	3.4	89.2	3.7	4.2	2.9	72.6	10.9	8.8	7.7
1 (n = 365)	83.6	6.8	9.6	74.5	7.4	7.7	10.4	54.5	9.9	14.2	21.4
2 or 3 (n = 354)	83.4	7.6	9.0	76.8	7.9	7.9	7.4	52.6	11.0	14.4	22.0
4 or more (n = 344)	73.0	11.0	16.0	72.7	8.1	7.9	11.3	45.9	11.9	16.0	26.2

Child Welfare Committee cases 1953–59	Number of delinquent acts										
	Until 15 years of age			15–18 years of age				Until July, 1979			
	0	*1*	*2 or more*	*0*	*1*	*2–4*	*5 or more*	*0*	*1*	*2–4*	*5 or more*
No (n = 5,820)	90.3	5.7	4.0	88.0	4.1	4.5	3.4	70.6	10.9	9.5	9.0
Yes (n = 527)	77.8	9.9	12.3	73.1	7.4	8.5	11.0	50.7	11.2	14.0	24.1
Total	89.3	6.0	4.7	86.7	4.4	4.8	4.1	69.0	10.9	9.8	10.3

Table 9–10. Percent boys known to the police between 15 and 18, according to mental test score in 1966 and social class in 1963

| Test score | Social class, 1963 | | | | | | |
| | Lower middle | | | Working class | | | |
	Upper middle n = 1,295	employ. n = 2,679	entrep. n = 555	skilled n = 1,685	unskilled n = 1,265	Unclassified n = 240	Total n = 7,719
– 19	—	—	—	—	—	—	—
20– 29	—	—	—	(35.1)	(26.5)	—	(28.6)
30– 39	—	20.6	—	25.7	26.2	—	23.5
40– 49	—	16.1	—	23.3	25.8	—	24.2
50– 59	(5.3)	15.0	(17.5)	16.0	18.7	—	19.8
60– 69	10.7	10.7	(12.0)	14.4	16.2	—	16.0
70– 79	5.1	7.3	13.1	10.7	14.2	—	11.8
80– 89	6.2	4.9	7.0	8.7	(15.7)	—	8.7
90– 99	3.8	5.2	(7.9)	—	—	—	6.5
100–109	2.0	—	—	—	—	—	3.6
110–120	—	—	—	—	—	—	(1.6)
Unknown (n = 917)	6.7	11.8	(23.5)	23.6	28.4	(26.3)	17.7
Total	5.6	10.4	12.4	17.2	20.7	21.7	13.3

Note: Test score is unknown for 165, 304, 51, 178, 162 and 57 boys, respectively, in the six categories of social class.

between-categories component is 1.5 percent). The corresponding percentages for delinquency before age 15 are 2.0 and 2.7, respectively, and for delinquency between 18 and 21 2.3 and 2.9, respectively. The average scores of nondelinquents and delinquents differ 0.55, 0.44, and 0.43 standard deviations, respectively, in the three age categories.

In the School Study one question asked was: "Do you plan to apply for gymnasium when the time comes?" Such an application would be filed in ninth form or later, and most of the respondents were in sixth form. Of all 7,719 boys in the cohort 12.7 percent did not answer the question, because they were no longer in the ordinary school system of the area (2.0 percent), were absent the day the questionnaire was filled out (9.6 percent) or just skipped the question (1.1 percent).

Delinquency rates for those respondents giving different answers within each social class are shown in table 9–11. It should be noted that between 15 and 18 the boys had actually decided whether to apply or not, and some of them had then had their applications turned down. However, if they decided not to apply, this decision need not be final, and if they were turned down, they could apply again. In all, 47 percent applied in the Stockholm area (in addition some applied outside the area), and about 37 percent were accepted. In addition, about 13 percent applied for a shorter version of *gymnasium*. The answers to the question about plans to apply varied markedly between social classes. Furthermore, within each response category the percentage who actually applied clearly varied by social class.[5]

Before age 15, 2.1 percent of the delinquency variance falls between reported plans (nonresponse excluded). Although plans are rather heavily correlated with social class, reported plans and class in combination accounted for little more than the plans do on their own, or 2.4 percent. Corresponding figures for the period 15 to 18 years are 3.0 percent and 3.9 percent, respectively.

Adding mean marks in sixth form as a third variable makes the between-categories component of variance jump to 9.4 percent. Then, however, the number of cells, i.e. combinations of social class, reported plans, and mean marks, has increased so much that the expected random between-cells component reaches 1.5 percent. Thus, the reproduced variance exceeds its expected random value by 7.9 percent of the total variance.

Mean marks in sixth form are related to, in the first place, the mental test score ($r = 0.64$) and, secondly, to social class. Within each social class test score as linear regressor reproduces 32 and 42 percent of the variance in marks. The regression lines differ somewhat but are approximately parallel and in rank order. For each boy in the analysis the residual average mark, i.e.

Table 9–11. Percent boys known to the police before the age of 15 and between 15 and 18, according to plans to apply for gymnasium and social class in 1963

"Do you plan to apply for gymnasium when the time comes?"	Upper middle $n = 1,295$	Lower middle		Working class		Unclassified $n = 240$	Total $n = 7,719$
		employ. $n = 2,679$	entrep. $n = 505$	skilled $n = 1,685$	unskilled $n = 1,265$		
		Social class, 1963					
		Percent known by the police before age of 15					
Yes	3.9	6.0	6.6	3.8	8.3	(7.5)	5.4
DK	8.3	11.1	11.0	13.0	16.6	(18.3)	12.8
No	—	14.5	(17.9)	16.2	17.0	—	16.3
Non response	6.3	9.5	(12.1)	18.3	20.7	20.3	13.4
Total	5.1	8.8	10.3	11.6	14.8	16.7	10.3
		Percent known by the police between 15 and 18					
Yes	4.0	6.2	4.4	10.4	14.5	(7.5)	6.8
DK	9.2	13.9	15.2	16.3	21.0	(23.9)	16.1
No	—	18.3	(23.1)	26.4	19.9	—	22.0
Non response	8.8	11.6	(20.7)	24.2	29.6	(25.4)	18.0
Total	5.6	10.4	12.4	17.2	20.7	21.7	13.3

Note: Nonresponse cases are 175, 327, 58, 186, 179 and 59 respectively, in the six categories of social class.

the deviation from the value expected, given his test score and social class, shows his estimated "relative achievement", over achievement if his average mark is better than that given by the regression line of his social class, and underachievement, if his average is below that line.

The delinquency rates vary clearly with relative achievement, both totally and within each class, as is shown by table 9–12 for delinquency between 15 and 18. Of the delinquency variance 2.2 percent fall between intervals of relative achievement (gamma = 0.29), whereas relative achievement and social class in combination reproduce 3.6 percent of the delinquency variance. For delinquency before the age of 15, the corresponding figure is 2.8 percent, for delinquency between 18 and 21 it is 2.9 percent, for all delinquency reported from 1966 to July, 1979, it is 5.7 percent, and for violent crimes during the same period it is 3.6 percent. For total delinquency up till July, 1979, relative achievement alone contributes 3.8 percent with a gamma-coefficient of 0.41. The expected random between-categories component is 0.5 percent.

Regression Analyses

Using the same highly telescoped delinquency variables as in table 9–9 and corresponding constructs for other periods as dependent interval-level variables, one may try various sets of regressors to see how much of the delinquency variance will be "explained" by the regressor sets. The analyses are summarized in table 9–13. The first regressor set consists of six family variables for the period 1953–59. The first four are the variables already seen in previous analyses: social class in 1953 (now as an interval-level variable assuming the steps between the two lower-middle categories and between the two working class categories to be smaller than the two other steps), social dependency, and the two dichotomies concerning parental criminality and Child Welfare Committee cases due to family conditions respectively. To these variables, the dichotomy of one or two parents in the family in 1953 and the interaction (product) of social class and dependency are added.

Since data on dependency and Child Welfare Committee cases are available only for municipalities within the metropolitan area, the analyses are made only for the subsample of boys born in this area. In addition, cases with unclassified social position are omitted. This leaves 6,121 boys. The six family regressors together reproduce 3.8 percent of the variance of delinquency before age 15, and 4.5 percent of the variance between 15 and 18.

Table 9–12. Percent boys known to the police between age 15–18, according to social class in 1963 and relative achievement, measured as deviation from the average 'mark in sixth form' estimated by mental test score in 1966 within each social class

| | Social class 1963 | | | | | |
| | Lower middle | | | Working class | | Total |
Relative achievement	Upper middle $n = 1,087$	employ. $n = 2,338$	entrep. $n = 495$	skilled $n = 1,494$	unskilled $n = 1,093$	$n = 6,507$
Below −1.00	—	(23.6)	—	—	—	28.2
−1.00 – −0.50	8.6	17.8	(23.2)	24.0	27.3	19.9
−0.50 – −0.15	5.6	12.9	14.0	22.2	19.7	14.9
−0.15 – 0.15	5.1	7.4	(8.1)	14.0	20.0	10.9
0.15 – 0.50	2.8	6.6	6.7	9.8	18.9	8.7
0.50 – 1.00	4.1	6.6	(3.9)	11.0	12.5	7.8
Above 1.00	—	(3.1)	—	—	—	5.4
Total	5.3	10.1	11.1	16.3	19.5	12.4

Table 9–13. Multiple regression analyses of delinquency variables

Delinquency (dependent variable)	Regressors				Included categories				n	$100 \times R^2$
	Social backgr.		Indiv charact.		Not born in area	Marks or abs. 6th not rec.	Unknown soc pos or fam str	Not in school study		
	1953–59	1960–65	School Study	School Records						
Before 15	6	—	—	—	no	yes	no	yes	6,121	3.8
15–18	6	—	—	—	no	yes	no	yes	6,121	4.5
Before 15	—	6	—	—	no	yes	no	yes	5,884	3.5
15–18	—	6	—	—	no	yes	no	yes	5,884	4.2
Before 15	—	6	—	—	yes	yes	no	yes	7,406	3.2
15–18	—	6	—	—	yes	yes	no	yes	7,406	4.0
Before 15	6	6	—	—	no	yes	no	yes	5,846	4.4
15–18	6	6	—	—	no	yes	no	yes	5,846	5.2
Before 15	6	4	13	5	no	no	no	no	4,339	8.4
15–18	6	4	13	5	no	no	no	no	4,339	10.5
18–21	6	4	13	5	no	no	no	no	4,339	8.2
1966–July, 1979	6	4	13	5	no	no	no	no	4,339	15.8
same, violence	6	4	13	5	no	no	no	no	4,339	6.7
Before 15	4	4	9	5	no	no	no	no	4,339	8.2
15–18	4	4	9	5	no	no	no	no	4,339	10.2
18–21	4	4	9	5	no	no	no	no	4,339	8.0
1966–July, 1979	4	4	9	5	no	no	no	no	4,339	15.6
same, violence	4	4	9	5	no	no	no	no	4,339	6.6
Before 15	1	4	13	5	yes	no	no	no	5,377	8.2
15–18	1	4	13	5	yes	no	no	no	5,377	10.0
18–21	1	4	13	5	yes	no	no	no	5,377	7.5
1966–July, 1979	1	4	13	5	yes	no	no	no	5,377	15.0
same, violence	1	4	13	5	yes	no	no	no	5,377	6.6

Then the analyses are repeated but with the corresponding family regressors for the period 1960–65, social class and family structure referring to 1963. For comparison, these analyses too are made for the subsample of boys born in the area, excluding 282 cases with unclassified social position. Reproduced variances now are 3.5 percent and 4.2 percent, respectively. The analyses are also carried out for the whole cohort of boys, now missing 313 boys. The contributions (R^2:s) are somewhat smaller than in the previous analyses.

Next the family variables from both periods are entered. Here again, of course, the subsample of boys born in the area must be used. The contributions now are about one percent higher than when variables from only the second period were used.

For the next series of analyses two changes are made in the set of regressors. First, family composition in 1963 and the interaction between social class in 1963 and dependency in 1960–65 are removed, leaving ten family regressors in the set. Secondly, this set of ten family regressors is extended with presumably relevant individual variables, as measures of adaptive resources and orientations, adjustment to school, and conceptions of the future. Most of the variables refer to the spring semester of 1966. Mental test score, scores for five fields of interest (outdoors, commercial, domestic, technical, and verbal), three attitudes toward school (perceived family attitude to higher education, psychological security at school, and interest in school work), plans for higher education, and three attitudes toward the future (called Perspective, Prospects, and Patience) are taken from the School Study. Unfortunately, the three orientations toward the future have very low reliability and cannot be expected to contribute much. Mean marks, marks on Conduct and Order, absence without excuse, and the dichtomy between ordinary and special classes are taken from each school in the area. They all refer to sixth form.

Thus this set of analyses deals with the subsample of boys belonging to the combination of subsamples for which the necessary variables are available: those born in the area and with known social-class position, those participating in the School Study, and those with recorded marks and absences in sixth form. As already mentioned, 2.0 percent of the boys had left the area in 1966. Of the remaining subsample the 9.6 percent who did not take part in the School Study are lost, together with the few with missing scores or answers on single questions.

Cases with unclassified social position tend to be different from the rest of the sample in several respects. Fortunately, they were only 298 in 1953 and 240 in 1963, and of the 1953 cases all but 45 belong to the subsample of those born outside the area[6]. The nonresponse cases of the School Study also

are selective. They are more numerous but not as selective as the nonclassified cases[7]. The overall effect of excluding boys with no record on marks and absences and the nonresponses in the School Study probably is to diminish the relative contribution of the regressor sets to the delinquency variances.

Adding the individual variables doubles the variances accounted for in the first two age categories. As usual, the total delinquency is best reproduced. However, removing several regressors hardly makes any difference. Even removing all family variables for the first period except social class in 1953 matters little. This last series of analyses included also those born outside the Stockholm area but within the country.

Concluding Remarks

The analyses have indicated some fairly clear associations between recorded delinquency on the one hand, and family conditions and individual characteristics on the other. The tabulations provide impressive evidence of the impact of sociological and sociopsychological factors on delinquency. Yet, the results are rather modest in terms of accounting for the delinquency distribution. Some fairly high gamma-coefficients but low phi-coefficients or small variance components between categories indicate that distinctions made are relevant but do not take us very far in accounting for the delinquency variation as a whole.

Further analyses can improve the situation, i.e. increase the reproduced component of the delinquency variance, in five ways. First, the measures used can be refined to catch more of the available information, e.g. on family composition, to improve their scale properties etc.

Second, other data can be introduced in the analyses. So far, almost exclusively, variables from the first two periods on Diagram 1 were used to account for delinquency. No data from the 1960 census were employed[8], and school records from ninth form were used only occasionally. No use was made of data from the Family Study, of applications to *gymnasium*, of later school data, or of information from the screening at military induction.

Third, one may attempt to estimate and correct for random measurement errors to see how much of the residual variance that may be systematic. Evidently, there are accidental elements in the recorded delinquency variables. In an attempt to get roughly equivalent split-half measures of the total delinquency until July, 1979, this variable was split in two measures, one for odd numbered years and one for even numbered years. The two part measures correlated 0.67. If the total measure were the sum of the part

measures, and if the part measures were equivalent, the reliability of the total measure should be 0.80. Both conditions seem approximately filled. Corresponding split-half measures for crimes of violence correlated 0.46, giving a reliability estimate of 0.63. Hence about 20 and 37 percent, respectively, of the two delinquency variables would be random. According to these rough estimates, the reproduced variance of the two delinquency variables in the fourth series of regression analyses in table 9–13 (15.8 percent and 6.7 percent, respectively) make 19.5 and 10.6 percent, respectively, of the nonrandom variances.

Fourth, the analyses have only explored family conditions and individual attributes assumed to reflect broad behavioral tendencies presumably related to delinquent behavior. In addition, one may attempt to delineate high and low risk categories due to interaction between family background, behavioral tendencies, and situational conditions, where the relevant variables differ between subsamples. This could take us very far, as we could make the classification into subcategories so detailed that each boy, being unique, made his own category. This would reproduce the delinquency variance completely, random and all. To be of interest the pattern of various combinations of variables should be restricted to what can be considered theoretically meaningful and sufficiently invariant technically.

Using more elaborate combinations of social background, situation, and individual characteristics probably is the most potent way to increase the percentage of delinquency variance accounted for, if the analysis is limited to the same substantive fields as before. By extending the set of regressors to other fields one may improve the results considerably. As already emphasized, family variables used here are structural variables, which presumably set conditions for the socialization process within the family but do not themselves measure crucial aspects of this intrafamily interaction process. Direct measures of this process would come causally close to the delinquency variables. Also, the personal characteristics used in the analyses may be seen partially as similarly conditioning the socialization process, partially as outcomes of this process. Among such outcomes attitudes to norms and normbreaking should be especially relevant to our dependent variables. However, they may be so close conceptually to the delinquency variables that strong correlations are more of a validation of the attitude measures than an explanatory finding, unless the correlations are strong enough to warrant the conclusion that the willingness factor dominates the delinquency probability almost to the exclusion of the ability and situational factors[9].

Fifth, the analyses did not make use of the constancy over time of behavioral patterns, including delinquent tendencies. Delinquency in a given period can be expected to be related to delinquency of an earlier period, since

relevant circumstances in the first period to some extent remain in the second period, without being sufficiently superseded by contrary factors there, and perhaps because delinquency in the early period made later delinquency more likely. If previously delinquency record is inserted as a regressor, the reproduced dependent variance most probably will increase. Table 9–14 shows fairly substantial associations between delinquency at different ages. (The Child Welfare Committee cases include a wide range of problem behavior, such as truancy and other problems at school, drug use, and criminal behavior.)

Since the square of phi expresses the proportion of variance accounted for by the earlier variable, the reproduced components are at least of the same order as in some regression analyses and rather elaborate tables. For instance, delinquency before 15 reproduces 5.9 percent of the delinquency after age 15. When Child Welfare Committee cases due to own behavior in 1960–65 is added to the 23 regressors of the last series of regression analyses in table 9–13 and used in the analysis of delinquency before 15, it increases the reproduced variance from 8.2 percent to 10.6 percent. When the same variable and delinquency before 15 are added to the set and used against

Table 9–14. Relations between delinquency measures referring to different periods

		Percent later delinquency					
Early delinquency		Before 15	15–18	Total	After 15	After 18	n
CWC-case, due	yes	42.4	46.3	75.8	—	—	335
to behavior,	no	8.8	11.8	29.0	—	—	7,384
1960–65	gamma	0.77	0.73	0.77	—	—	7,719
	phi	0.16	0.20	0.21	—	—	7,719
Before 15	yes	—	41.5	—	58.6	47.4	793
	no	—	9.8	—	23.1	18.3	6,926
	gamma	—	0.73	—	0.65	0.60	7,719
	phi	—	0.29	—	0.24	0.22	7,719
15–18	yes	—	—	—	—	58.7	1,024
	no	—	—	—	—	15.5	6,695
	gamma	—	—	—	—	0.42	7,719
	phi	—	—	—	—	0.19	7,719

delinquency between 15 and 18, a substantial increase in obtained, from 10.0 percent to 17.9 percent.

The approaches mentioned above certainly will increase the delinquency variation accounted for by our sociological and sociopsychological variables. It is doubtful, however, whether they will let the level of reproduced variance reach an entirely new order of magnitude. One may also notice that the kind of variables used here often are more successful, without in any way reaching sensational heights, with other dependent behavioral variables already in fairly simple analyses. In the metropolitan cohort of boys, social class in 1963 accounts for 9 percent of the mental test score variance in 1966 and for the same proportion of the variance in mean marks in sixth form. The test score reproduces 41 percent of the variance in marks, and together with social class it accounts for 42 percent. Social class also accounts for 13 percent of the variance of the boys' plans for *gymnasium* in 1966 and for 15 percent of the variance in the actual applications. Together social class and marks in sixth form account for 36 percent of the variance in plans for *gymnasium* (expected random between-cells component 0.5 percent). Plans and social class together "explain" 36 percent of the variation in applications. Adding marks in ninth form brings reproduction up to 45 percent (expected random between-cells component 1.7 percent).

If the delinquency of both boys and girls had been analyzed, girls would be a low risk category, and sex would have stood for 4 percent of the delinquency variance (between 15 and 18). This compares to sex components of 33 percent and 47 percent, respectively, in the domestic and technical interest scores (cf note 1). In the family sample, seven regressors concerning family background and individual characteristics reproduced 50 percent of the variance of the boys' educational plans, and four of the same regressors together with three others accounted for 38 percent of the variance in the social class level of the boys' occupational plans (Wolf-Seibel, 1980:105,135).

Finally, it should be mentioned that among decisions made by the Stockholm Child Welfare Committee as to treatment of juvenile delinquents between 13 and 16 years of age, between 42 and 53 percent of decision variations were reproduced in various subsamples of cases (R^2 adjusted for lost degrees of freedom, only considering subsamples of at least 200 cases; Janson, 1977).

The tentative and by no means irrefutable conclusion of the analysis of the juvenile delinquency data, as it stands for the present, is that the results to some extent may be distorted by bad measures, omissions, and unimaginative analyses, but that they still speak against a strong correlation between delinquency and the family's social position and even against a

strong correlation between delinquency and social position combined with an assortment of individual adaptive resources and attitudes. The importance of the social position and the individual characteristics to the delinquency variation between cohort members looks quite different in the perspective of differential life-chances and the variance partitioning perspective. The delinquency risks differ strongly between categories, but categories with extreme risks are small, and the total contribution to the delinquency variance is modest.

Notes

1. When interest in five types of leisure activities (outdoors, commercial, domestic, technical, and verbal) was scored, the averages for boys and girls differed less among children from upper middle class families than among children from unskilled working class families. For domestic, technical, and verbal interests, the differences between upper middle class and working class went in opposite directions for boys and girls. Thus, working class boys tended to have a somewhat stronger technical interest than upper middle class boys, whereas upper middle class girls on the average were somewhat more interested in technical matters than were working class girls.

2. Recorded delinquency refers to law-breaking acts recorded by the police. Delinquents are under age until 15, but the reports available to the project start on January 1, 1966, the year the cohort members became 13. Delinquencies are allocated to age intervals according to the dates the acts were committed. When several acts of the same kind, e.g. a series of car thefts, are included in the same report, they are all allocated to the same age interval as the first act. Although generally the time lag between act and report is small, some acts were committed in 1965 and a few as early as 1964.

The reports do not include ordinary traffic violations and similar minor misconducts. They do, however, include acts committed all over the country, i.e. not just acts committed within the Stockholm metropolitan area. Thus, cohort members were under risk as long as they remained in Sweden. Those who died before the beginning of the period of observation should be omitted from the analyses. Also, those who emigrated before the period started and did not return before the period ended should be omitted. This has not been done. However, the error is very small, since few boys died or emigrated at an early age. Before 1966 only five boys had died, and in 1966-68 six more died. Before 1966 fourteen boys emigrated. Six of them returned. In 1966-68 another nineteen boys left Sweden, three to come back. In all, up till 1980 109 boys, or 1.4 percent, had died. Several of the deceased boys were known to the police. In 1979, 69 boys had left the country and not (yet) returned. In addition about 50 had left and come back.

3. The operational definition of being known as a delinquent before age 15 is to be registered by the police in 1966 or later for at least one delinquent act committed no later than the month the boy became 15.

4. The between-categories component of variance, i.e. the proportion of variance accounted for by the set of categories, must be expected to be higher than zero, even for irrelevant sets of categories. If cases were randomly assigned to categories, the expected relative between-categories component of variance would be the quotient with roughly the number of cells as the numerator and the number of cases less one as the denominator. Thus in tables 9-5 and 9-6, the expected random between-categories component is about 0.2 percent.

5. In the five social classes the percentages of "Yes" answers to the question whether they planned to apply were 77.3, 53.8, 45.9, 31.3, and 22.3, respectively, whereas the "No" answers were 2.3, 10.2, 15.7, 18.5, and 22.5 percent, respectively. The responses varied strongly with marks in sixth form. Controlling for marks, responses still varied between social classes for all but the very highest marks. For instance, with marks ranging from 5 (highest) to 1 (lowest), in the interval 3.00–3.49 the percentages planning to apply were 73.7, 57.4, 46.0, 36.5, and 29.9, respectively, in the five social classes.

Of those who said they intended to apply the percentages actually applying were 88.1, 77.9, 75.9, 68.4, and 57.0, respectively, in the five social classes. Among those who did not know in 1966 whether they would apply, 55.3, 32.5, 26.7, 20.1, and 14.1 percent, respectively, applied some three or more years later. The percentage applying varied strongly with marks in ninth form. Controlling for marks, applications were found to vary between social classes except for the highest marks.

6. All foreign born boys are among those with unknown social positions in 1953. Swedish born boys with unclassified social positions in 1953 are clearly selected with much higher than average percentages of one parent families, dependency, and Child Welfare cases, including cases in social care.

7. Among nonresponse cases 13.2 percent were delinquents before age 15, 17.7 percent were delinquents 15–18 years old, whereas the corresponding figures for participants in the School Study are 9.9 and 12.7 percent, respectively.

8. However, by mistake a family composition variable from the 1960 census was substituted for the 1963 family composition variable in the second and fourth series of regression analyses.

9. The Family Study contains a few variables describing interactions between child and parents. There are no measures of attitudes toward norms and normbreaking in Projekt Metropolitan.

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10 HYPERACTIVE BOYS AND THEIR BROTHERS AT 21: PREDICTORS OF AGGRESSIVE AND ANTISOCIAL OUTCOMES

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Introduction

Most of the systematic longitudinal studies of children with the hyperkinetic reaction/minimal brain dysfunction syndrome/attention deficit disorder (HK/MBD/ADD) had their beginnings in the numerous investigations of the effects of stimulant medication that were carried out between the mid 50's and mid 60's. Many of these children reached adolescence in the early 70's, and they are becoming adults in the late 70's and 80's. Almost no prospectively diagnosed HK/MBD/ADD children have yet entered their 30th year. We are therefore beginning to see the first studies describing adult outcomes in HK/MBD/ADD (Feldman, Denhoff and Denhoff, 1979;

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Milman, 1979; Weiss, Hechtman and Perlman, 1978; Weiss, Hechtman, Perlman, Hopkins and Wener, 1979) and testing potential predictors of those adult outcomes (Hechtman, Weiss, Perlman and Amsel, 1981).

There are three general theories about the outcome of childhood hyperactivity[1]. In the Developmental Delay theory, hyperactivity is seen as a mere maturational lag; hyperactive children are expected to become normal around adolescence and to then be indistinguishable from peers who were not hyperactive as children. In what might be called the Continual Display theory, central hyperactive symptoms persist throughout life; although once overactive children may become less frenetic and peripatetic, they show the lifelong attention deficits and impulsivity which are the hallmarks of residual ADD or adult MBD. Across time, they may also develop a variety of so called secondary psychological symptoms, such as self esteem deficits, and they may continue to have the academic skill deficits brought about by their childhood learning problems. In the Eventual Decay theory, hyperactive children are expected to develop relative severe psychiatric syndromes as adults: among the common pathological outcomes are antisocial personality, alcoholism, explosive personality, and schizophrenia.

To date, the several studies of the adult outcome of childhood hyperactivity have yielded some support for each of these diverse theories, and therefore there is some evidence suggesting normal, residual, and pathological outcomes. Most studies have contained subjects across a range of ages at followup (e.g., 16 to 25), and none has yet used the structured psychiatric interviews and explicit research diagnostic criteria which have increased the reliability of adult diagnostic practice.

In the outcome portion of the present study, we will compare several aggressive and antisocial outcomes among 22 previously HK/MBD males and among their 22 nonHK/MBD full brothers. All probands and brothers were tested and interviewed when between 21 and 23 years of age. The age span was chosen in order that all subjects would be well past high school age and the adolescent period that numerous previous studies (e.g., Weiss, Kruger, Danielson and Elman, 1975) have demonstrated to be stormy for them. A central question in these outcome analyses will be whether or not previous hyperactive probands show more aggressive and antisocial behavior as young adults.

Another major question has concerned the predictors of adolescent and adult outcome among hyperactive children. Since this is widely acknowledged to be a heterogeneous population of children, the search has continued for more homogeneous subgroups or, alternatively, for childhood characteristics or environmental variables that will relate to later functioning. A reliable and valid subgrouping system or a cross validated set of significant

predictors of outcome would greatly benefit both clinical practice and clinical research.

Previously (Loney, Langhorne, Paternite, Whaley-Klahn, Blair-Broeker and Hacker, 1980), we carried out a series of multiple regression analyses to identify the childhood predictors of ratings of adolescent symptom behavior among a group of 135 HK/MBD boys. Subsequently (Loney, Kramer and Milich, 1981), we extended these analyses to predict adolescent delinquency and academic achievement, and we derived from our empirical findings a model for understanding the relationships between childhood characteristics, environmental familial variables, and drug treatment on the one hand—and adolescent symptoms, delinquency, and achievement on the other. That model links childhood aggression and familial ecological variables—but not childhood hyperactivity—to most subsequent outcomes, including adolescent aggression, delinquency, and substance use.

In the prediction portion of the present study, we will carry out a series of regression analyses to identify predictors of aggressive and antisocial outcomes in 65 young adults who were referred and diagnosed HK/MBD as children and who were treated clinically with CNS stimulant medication for an average of three years. A central question in these prediction analyses will be whether or not previously identified predictors of aggressive behavior in adolescence (such as childhood aggression, parental laxity, and urban residence) will continue to account for significant variation in adult aggressive outcomes. Another salient issue is whether childhood symptoms from the hyperactivity triad (i.e., hyperactivity, inattention, and impulsivity) will be significantly related to adult aggression and antisocial behavior; such symptoms have not been related to adolescent aggression and antisocial behavior in our previous studies.

Methods

Probands

All of the HK/MBD boys in this study were originally seen at the University of Iowa Outpatient Psychiatric Clinic between 1967 and 1972 for diagnostic evaluation and treatment recommendations. All were between 4 and 12 years of age at referral; all were recommended by the staff psychiatrist for a trial of treatment with a CNS stimulant because of a history and symptoms suggesting the HK/MBD syndrome; none had an IQ below 70, sensory loss,

psychosis, epileptic seizures, or unequivocal brain injury. Of an original group of 200 HK/MBD boys, 135 were medicated by physicians at the University clinic for an average of three years, and 124 of those 135 (92%) were followed up by the present investigators an average of five years after referral. Our previous studies have utilized subsamples of those 124 boys to identify the predictors of adolescent outcome as rated by parents and examiners (Loney et al., 1980), as assessed in structured interviews and on standardized tests (Loney et al., 1981), and as rated by junior high school teachers (Prinz, 1981). The additional 65 boys were either medicated by physicians at the University clinic and excluded from the previous studies because of treatment delays beyond 6 weeks from evaluation or incomplete progress notes, or they were referred back to local physicians to be medicated and followed in their own communities.

All 200 of these HK/MBD boys are now being followed up at between 21 to 23 years of age, as are 100 of their nonHK/MBD full brothers. A lengthy battery of tests and interviews is being administered. The present preliminary analyses were carried out on selected data from the referral and the young adult phases of the overall study. At the time that these analyses were done, a total of 65 of the previously hyperactive probands and 32 of the non-hyperactive full brothers had been seen as young adults. In 22 cases, both the proband and his own brother had been seen, and 22 proband/brother pairs were therefore available for analysis. In an additional 10 cases, a nonhyper-active brother had been seen, but the corresponding proband (his younger brother) had not yet been seen. The additional 43 probands were either older than their full brothers who had not yet been seen, or they had no eligible full brother who was near enough in age to reach 21 within the time frame of the study.

Selection of Outcome/Dependent Variables

Dependent variables were selected to survey self-reported aggressive and antisocial outcomes at young adult followup. We wished to examine relevant psychiatric diagnoses, as well as more detailed information about illegal acts, police sanctions, and experience with substances. We believed that employ-ing a relatively large number of overlapping variables would allow us to arrive at maximally valid conclusions despite the relatively small number of subjects currently available for analysis.

We therefore analyzed data from the following instruments at young adulthood: the Schedule for Schizophrenia and Affective Disorders-Lifetime Version (SADS-L; Spitzer and Endicott, 1978; antisocial personality,

alcoholism, and drug abuse diagnoses); the Iowa Crime and Punishment Survey (CAPS; Loney, Kramer and Whaley-Klahn, 1978; preselected items concerning moving traffic violations, crimes against property, crimes against persons, and contacts with police); and the National Survey on Drug Abuse (NSDA; Abelson & Fishburne, 1977; preselected items concerning lifetime use of marijuana, inhalants, cocaine, hallucinogens, and opiates, as well as nonmedical use of sedatives, stimulants, and tranquilizers).

Outcome Analyses

Differences in dichotomous outcomes at 21 years of age between formerly hyperactive probands and their nonhyperactive full brothers were tested in the 22 proband brother pairs with McNemar's test for correlated proportions. Differences between the probands and brothers on continuous outcome variables were tested by t-tests for correlated samples. Both of these tests make allowances for the fact that the probands and brothers are paired. In all of the outcome analyses, the one-tailed X^2 or t value was accepted, since in all cases the hypothesis was that the previously hyperactive probands would be more asymptomatic or aggressive than their nonhyperactive brothers. The $p < .10$ level of significance was reported for the outcome analyses, because it was believed better in these preliminary analyses to entertain hypotheses of effects that will later prove to be false, than to reject hypotheses of effects that are actually genuine. That decision is, of course, partly a matter of preference, so in all instances we have presented enough information to enable readers to distinguish between differences or relationships that were significant at $p < .10$ (but $> .05$) and those that were significant at more conventional levels ($p < .05$ or .01).

Selection of
Potential Predictors/Independent Variables

Selection of potential predictors (independent variables) was guided by several general considerations: (1) we wished to use childhood predictor variables that had been significant when employed in previous studies; (2) we wished to use variables from each of the major classes of childhood predictors in our theoretical model; (3) we wished to avoid overloading the list with predictors from a particular class (e.g., familial); and (4) we wished to use as few predictors as possible in order to maximize statistical power. A balance of these various considerations produced the list of potential

Table 10-1. Potential Predictors

TREATMENT	Age at referral

INDIVIDUAL	Age at onset of problem[a]
	Childhood IQ[c]
	Childhood Hyperactivity (overactivity, inattention, impulsivity)[b]
	Childhood Aggression (irritability, aggression, antisocial behavior)[b]
	Academic Problems[a]
ECOLOGICAL	Urban residence (address not on rural route)[a]
	Socioeconomic Class (Hollingshead and Redlich head of household)[a]
	Number of Children in Home at Referral[b]
FAMILIAL	Family Instability (number of changes in family composition)[b]
	Excessive Parental Busyness (self and spouse report by both parents)[a]
	Excessive Parental Control (too strict, demanding)[a]
	Excessive Parental Short Temper[a]
	Parental Psychopathology (psychiatric, social, legal problems)[b]

[a]Data obtained from intake forms filled out by parents at the time of referral.

[b]Data rated by judges from material placed in the children's medical charts by clinic psychiatrists, psychologists, and social workers; different judges rated each variable.

[c]Data obtained by school or clinic psychologist within one year prior to referral.

predictors in table 10-1. If the data were missing for as many as 16% of the total group of 200 HK/MBD probands, the variable was eliminated from all analyses; otherwise missing values were replaced with the mean of the distribution.

Predictive Analyses

Predictors of the various dependent or outcome variables were sought in the entire group of 65 previously hyperactive probands. All highly skewed dependent variables (less than 25% of probands in one category) were eliminated before analysis. Each of the remaining dependent variables was subjected to a conventional stepwise multiple regression analysis, using the same set of 14 independent variables in each instance. Thus, independent

variables for the childhood period that contributed significantly to young adult outcome were identified. Again, both the $p < .10$ and the $p < .05$ levels of significance are indicated.

Results and Discussion

Differences in Outcome Between Probands and Brothers

Differences in Outcome on the SADS-L. Differences between probands and brothers at 21 on the SADS-L criteria for the diagnosis of Antisocial Personality are presented in table 10-2. Probands and brothers differ on numerous individual criteria. Significantly more probands than brothers meet nine of eleven individual Antisocial criteria concerning onset before 15 years of age. More probands than brothers reported that they showed early signs of Antisocial Personality (frequent truancy, expulsion from school, involvement with juvenile court, repeated running away, persistent lying, stealing, vandalism, academic underachievement, and chronic rule violations). Although these differences suggest that the proband sample contains many individuals who could have been diagnosed during childhood as having a conduct disorder instead of or in addition to their MBD/HK diagnosis, relatively few were considered to have an Unsocialized Aggressive Reaction at the time of referral between 4 and 12 years of age. Also, significantly more probands than brothers meet three of the ten individual adult criteria (those having to do with significant unemployment, lack of a permanent residence, and impaired interpersonal relationships).

In diagnosing Antisocial Personality, the SADS-L criterion for impaired interpersonal relationships was not required for three reasons: (1) We felt that the direct questions suggested in the manual (Is there anyone that you really feel very close to? Do you keep the same friends for a long time?) were not identifying subjects with obvious sociopathic attitudes toward people; (2) We were not convinced that in all cases valid judgments could be made on some other basis; and (3) most importantly, the relationship criterion was not retained in the DSM-III criteria for Antisocial Personality, which otherwise parallel our SADS-L criteria very closely.

When overall criteria for childhood onset, poor occupational performance, and adult antisocial behavior were applied, 45% of probands (10 of 22) could be diagnosed as having Antisocial Personality—compared to 18% of brothers (4 of 22). This more than twofold excess of antisocial personality

Table 10-2. SADS-L Criteria for Antisocial Personality Met at 21 Years of Age by 22 Ex-Hyperactive Probands and Their 22 Full Brothers

	Percent of Probands	*Percent of Brothers*
A. Onset in Childhood (before age 15)		
At least 3 required		
1. Frequent truancy	41	14**
2. Expulsion from school	54	18***
3. Juvenile court involvement	36	14*
4. Ran away at least twice	36	14*
5. Persistent lying	50	14**
6. Early or aggressive sex	18	18
7. Early drinking (before peers)	27	27
8. Thefts	36	14**
9. Vandalism	32	9*
10. School achievement below level expected on basis of IQ	77	50*
11. Chronic rule violations at home and/or school	68	41*
B. Poor Occupational Performance (past age 15)		
At least 1 required		
1. Frequent job changes	41	32
2. Significant unemployment	50	18***
3. Serious absenteeism	9	14
C. Additional Adult Criteria (past age 15)		
At least 2 required		
1. Three or more serious arrests	27	18
2. Two or more divorces/separations	4	4
3. Physical fights	41	23
4. Often drunk weekly or more	41	23
5. Frequent debt defaults	14	14
6. Period with no permanent residence	27	9*
D. Impaired Interpersonal Relationships	36	9**
Not required		
Currently Meet Combined Criteria for Antisocial Personality	45	18**

*Proportion of probands who meet criterion is different from proportion of brothers at $p \leq$ .10 level (one-tailed) by McNemar's test for correlated proportions.
**Proportions differ at $p \leq$ .05 level (one-tailed).
***Proportions differ at $p \leq$ .01 level (one-tailed).

diagnoses in the probands is especially noteworthy, because brothers were excluded only if they had been referred or treated in childhood for a learning or behavior disorder. Instead of eliminating all brothers who could have been diagnosed in childhood as having minimal brain dysfunction, a learning disability, or an Attention Deficit, Conduct, or Oppositional Disorder (and, because the necessary childhood criteria would not be met, arbitrarily decreasing the number of brothers who would meet criteria for Antisocial Personality as adults), we chose to control the correlation between probands and brothers statistically.

The statistical test used in the these analyses can be thought of as comparing proband/brother pairs who have nonmatching diagnoses, ignoring pairs where both proband and brother are Antisocial (in this case, 18% of pairs) and pairs were neither proband nor brother is Antisocial (54% of pairs). In the present case, probands were diagnosed Antisocial in all of 6 pairs with nonmatching diagnoses; brothers were diagnosed Antisocial in none of the nonmatching pairs. The higher the correlation between probands and brothers (i.e., the more pairs with matching diagnoses), the more pairs are effectively ignored in the analysis.

The use of instruments such as the SADS-L, of course, allows a highly standardized, and thus highly comparable, set of diagnoses to be made. Not only can one make relative statements within a given study (e.g., more probands than brothers are Antisocial), but one can also make comparisons across studies to achieve a more confident statement. In the present case, although the numbers in both analyses are quite small, it seems clear that many more of these formerly hyperactive probands are Antisocial than are 66 males involved as normal controls in the Collaborative Study of Depression. Only 6% of that normal sample meets even one of the occupational criteria for Antisocial Personality; none meets any of the additional adult criteria; and therefore none of that normal sample was Antisocial (Andreasen and Olsen, 1981). The diagnostic rate among normals may also be exceeded by the brothers of our probands; supplementary analyses indicated numerous significant correlations between probands and brothers on the SADS-L criteria, perhaps because brothers share many of the familial factors (genetic or environmental) which presumably contribute to Antisocial Personality in the probands.

Differences between probands and brothers at 21 on the SADS-L criteria for the diagnosis of Alcoholism and Drug Abuse are presented in table 10–3. Probands and brothers do not differ significantly on any of 19 individual criteria for Alcoholism. Furthermore, when the overall criteria for Alcoholism were applied, 27% of probands (6 out of 22) as well as 18% of brothers (4 out of 22) could be diagnosed as having definite Alcoholism. An

Table 10-3. SADS-L Criteria for Alcoholism or Drug Abuse Met at 21 Years of Age by 22 Ex-Hyperactive Probands and Their 22 Full Brothers

		Percent of Probands*	Percent of Brothers*
A.	Heavy Drinking of at Least One Month's Duration (Required)	27	27
B.	Additional Criteria (3 required for definite, 2 for probable)		
	1. Period of drinking too much	41	45
	2. Others have objected to drinking	36	36
	3. Period when often couldn't stop drinking	9	9
	4. Frequent drinking before breakfast	9	4
	5. Frequent job problems because of drinking	4	9
	6. Job loss because of drinking	14	0
	7. Frequent difficulty with family/friends because of drinking	14	14
	8. Divorce/separation because of drinking	4	4
	9. Ever on an alcoholic bender	27	23
	10. Physical violence while drinking (at least twice)	45	36
	11. Traffic/driving difficulties because of drinking	23	18
	12. Picked up by police (non-traffic) due to drinking	27	14
	13. Ever had blackouts	27	14
	14. Frequent tremors due to drinking	14	9
	15. Ever had delirium tremens	4	0
	16. Ever had hallucinations after drinking stopped	0	0
	17. Seizures after drinking stopped	0	0
	18. Physical complications (e.g., cirrhosis) due to drinking	0	4
Currently Meet Criteria for Alcoholism		14	0
Ever Met Criteria for Alcoholism (probable included)		27	23
Ever Met Criteria for Alcoholism (probable excluded)		27	18
Currently Meet Criteria for Drug Abuse		4	4
Ever Met Criteria for Drug Abuse		9	9

*In no instance does the proportion of probands differ from the proportion of brothers at $p = .10$ level (one-tailed) or less.

additional brother met the criteria for probable Alcoholism. Therefore, in terms of lifetime diagnosis of Alcoholism, rates for probands and brothers are essentially identical—and again, compared to other SADS-L data on normal males (Andreasen and Olsen, 1981), relatively higher. Some 9% of that normal sample had ever met criteria for probable or definite Alcoholism; only 17% said they had had periods of drinking too much. More than one third of both probands and brothers acknowledge periods of drinking too much; say their friends and/or family have complained about their drinking, and describe at least two episodes of physical violence while drinking. Although 14% of probands (3 out of 22) met the criteria for Alcoholism at the time of the SADS-L interview and none of the brothers did, that numerical difference is only apparent, since it did not reach even the liberal significance level adopted for the present preliminary analyses ($p < .10$, one-tailed). It might also be noted that, despite the numerous significant differences between probands and brothers on Antisocial criteria (table 10–2), none of differences on Antisocial criteria involving alcohol (e.g., early drinking, often drunk weekly or more) are significant. Similarly, there are no differences between probands and brothers in either current or lifetime diagnosis of Drug Abuse.

Our approach in applying the SADS-L criteria was to diagnose Antisocial Personality and Alcoholism separately, rather than attempt to exclude those manifestations of antisocial behavior which could be attributed to or associated with drinking. Therefore we were able, after diagnosing all 65 exhyperactive probands, to determine how many probands received both diagnoses. Of the 65 probands, 19 (29%) were considered to have met the lifetime criteria for Alcoholism (with probables included); this compared to a rate of 27% among the 22 probands who are included in the pairwise analyses because they have brothers who have already been seen. Of the 19 Alcoholic probands, 15 (79%) were also considered to have met the criteria for Antisocial Personality. Conversely, of the 65 probands, 24 (37%) met criteria for Antisocial Personality; this compares to a rate of 45% among the 22 probands in the proband/brother analyses. Of the 24 Antisocial probands, 15 (62%) were also Alcoholic. In all, 23% of the 65 ex-hyperactive probands were both Antisocial and Alcoholic by SADS-L criteria; 14% were Antisocial only; 6% were Alcoholic only; and only 57% were neither Antisocial nor Alcoholic. Thus, 43% of the 65 exhyperactive probands whom we have seen to date are Antisocial and/or Alcoholic by SADS-L diagnostic criteria.

Differences in Outcome on the Crime and Punishment Survey. A more detailed examination of self-reported illegal acts and official sanctions was

provided by the Iowa Crime and Punishment Survey (CAPS). In table 10–4, it can be seen that significant differences between probands and their brothers were found primarily in the category, Crimes Against Persons. Significantly more of the former hyperactives had carried a gun or knife, been in a fight where weapons were used, and threatened to hurt or almost hurt someone. (Moreover, of those who had been in a fight with weapons, significantly more probands than brothers—54% versus 15%—reported that bodily damage had been done to the point that a physician's attention was sought.) In the case of all other nondrinking crimes, numerical differences were in the direction of increased rates among the probands. Thus in the Crime portion of the CAPS, probands committed more offenses against persons, and there is some suggestion that probands may have committed more offenses in general.

In the Punishment section of the CAPS, probands had no more total police contacts, but their most extensive involvement with police was more serious than was their brothers'. In descriptive terms, 41% of probands (9 of 22) had been convicted and spent time in jail or prison, compared to only 5% of brothers (1 of 22). Analyses comparing the severity of sanctions given probands and brothers for individual offenses suggested that the greater severity of the sanctions given probands was related to their increased rate of offenses against persons.

Differences in Outcome on the National Survey on Drug Abuse. A more detailed examination of self-reported lifetime drug use was provided by the National Survey on Drug Abuse (NSDA) interview. In table 10–5, none of the differences between probands and brothers reaches significance. However, when the responses of probands and brothers are compared individually to normative data from the National Survey (Abelson and Fishburne, 1977), it appears that more probands have had experience with inhalants, cocaine, opiates, and nonmedical sedatives and stimulants than have the average 18 to 25 year olds in the NSDA normative data. By comparison, more brothers tend to have tried only one substance than have normals: nonmedical stimulants. All seven analyzed drugs on which numerical differences occurred showed differences in the direction of increased rates among the probands. Taken together, these data on 22 proband/brother pairs suggest to us that more probands have experimented with a greater range of illegal substances. However, we may be dealing here with the accumulated effects of response sets: a tendency by the ex-hyperactive probands impulsively to report their actual use without consideration of social desirability, a lack of defensiveness due to previous experience with the clinic, etc. A final answer will have to await total data

Table 10–4. Percent of Ex-Hyperactive Probands and of Their Full Brothers Who Reported Illegal Acts and Police Contacts on the Iowa Crime and Punishment Survey (CAPS)

	Percent of Probands	Percent of Brothers
Moving traffic violations		
Drive over speed limit	100	100
Run stop sign	91	68*
Run red light	73	73
Make illegal turn	64	64
Drive without valid license	50	41
Drive while under legal age	32	23
Drive while drinking	64	73
Drive while drunk	32	27
License suspended or revoked	47	21
Crimes against persons		
Hit anyone or been in physical fight	91	86
Threaten or almost hurt someone	86	64*
Owned a gun	77	. 73
Carried gun or knife	59	27*
Been in a fight where weapons used	62	31*
Taken purse or wallet from person	9	9
Crimes against property		
Shoplifting	64	45
Break and enter building	36	23
Ever set a fire	27	18
Drive stolen car	14	14
Contacts with Police		
Total number of police contacts	5.57	4.67
Most serious legal sanction	4.18	2.92***

*Proportion of probands is different from proportion of brothers at $p \leq .10$ level (one-tailed)
**Proportions differ at $p \leq .05$ level (one-tailed)
***Proportions differ at $p \leq .01$ level (one-tailed)

collection, which will not only allow us to analyze more pairs (projected number of pairs is 85), but it is hoped will also permit the addition of 1981 NSDA data—as well as the application of controls for differences between the NSDA norms and our data on sex, race, region, and age.

In supplementary analyses of NSDA questions involving Current Use (extent of use this month, extent of use in previous month, characterization of

Table 10–5. Percent of 22 Ex-Hyperactive Probands and of Their 22 Full Brothers Who Reported They Had Ever Tried Substances in the National Survey on Drug Abuse Interview

Substance	Percent of Probands†	Percent of Brothers†	Percent of NSDA Sample
Marijuana	86	73	75[a]
Inhalants (glue, etc.)	36**	27	16[b]
Cocaine	50**	36	28[b]
Hallucinogens (LSD, etc.)	41	41	25[b]
Opiates (codeine, etc.)	33*	19	14[c]
Sedatives (nonmedical)	45**	32	22[a]
Stimulants (nonmedical)	45**	41*	22[a]
Tranquilizers (nonmedical)	32	23	20[a]

† In no instance does the proportion of probands differ from the proportion of brothers at $p = .10$ level (one tailed) or less.

*Proportion of this group who report any use of this substance is different from National Survey on Drug Abuse (NSDA) data at $p \leq .10$ level (two-tailed) by χ^2 test.

**Proportion differs from NSDA data at $p \leq .05$ level (two-tailed).

[a]1979 data based on interviews with 935 18- to 25-year-old males.

[b]1979 NSDA data based on interviews with 2044 18- to 25-year-olds.

[c]1977 NSDA data based on interviews with 1500 18- to 25-year-olds.

self as user) of five types of substances (marijuana, inhalants, cocaine, hallucinogens, and opiates), probands reported more days' use of marijuana during the current and previous months. Probands were also significantly more likely to have tried marijuana at their first opportunity, and more of them than brothers considered themselves to be regular users of both cocaine and opiates. All of these findings point to greater involvement with substances by exhyperactive probands, as compared to their nonhyperactive brothers.

These probands all had a history of stimulant drug treatment of from one month's to seven years' duration (mean of approximately 3 years). Data from the adolescent followup of this same sample (Loney et al., 1981) suggest that probands whose symptoms respond best to medication are less likely to show subsequent irritable behavior and illegal drug use. Data on the same NSDA interview from a different sample of medicated hyperactive probands followed at adolescence and compared with a matched un-medicated group (Kramer, Loney and Whaley-Klahn, 1981) also suggest that stimulant medication decreases the risk of subsequent use of illegal drugs. Thus, it is likely that the differences between probands' and brothers'

rates of substance use in the present study has been decreased, rather than increased by the probands' treatment history.

Summary of Outcome Findings.   It is important to realize that these group averages conceal a variety of outcomes ranging from deviant to normal. As Hechtman (Hechtman, Weiss, Perlman and Tuck, in press) has pointed out, there are hyperactive children who are essentially normal as adults, some who have only a continuation of their basic hyperactive symptomatology, as well as others who are quite deviant psychiatrically. Within each group of previously hyperactive adults, then, there is a Normal subgroup, a Residual subgroup, and a Pathological subgroup, thus lending some support to the Developmental Delay theory, the Continual Display theory, and the Eventual Decay theory. Inspection of the present results also suggests that there is variance across outcomes, even among those outcomes which can all be considered aggressive or antisocial. More previously hyperactive probands appear to be antisocial than are alcoholic, for example.

   Although the present constraints of space do not allow a complete discussion of the issues, it is obvious that some apparent discrepancies exist among the various late adolescent and adult outcome studies of the HK/ MBD/ADD syndrome. Of Weiss and Hechtman's sample, for example, it is said that "while many probands continue to have some difficulties of adjustment, only a small (less than 10%) minority . . . had serious continued antisocial behavior." In contrast, an ADD group followed by Cantwell (1981) and Satterfield (Satterfield, Hoppe and Schell, 1981) using official arrest records showed, at a mean age of 17 years, offender rates much higher than those of controls. Among lower SES probands, for example, 45% had a record of multiple serious offenses, as compared to 6% of controls.

   Differences in initial diagnostic definitions, potential subject pool, exclusion criteria, subject attrition, age at followup, and measures taken at followup combine to account for many of the different results of the outcome studies. It is also clear that investigators who take the lifetime diagnosis or cumulative approach are going to identify more probands as deviant than those who require continuing symptomatic behavior over time or the occurrence of behavior during a brief and recent time period. For example, Weiss and Hechtman's probands tended to differ from controls ($p < .07$) in court referrals over the 5 years preceding followup, but not in the preceding one year.

   While no one approach is necessarily to be preferred, attention to differences among approaches is important in separating real discrepancies between studies from those that are only apparent. A close inspection of the various adolescent and adult followup studies suggests to us that there are

significant differences between probands and normals in aggressive and antisocial outcomes, that there may be some differences in use of illegal drugs, and that there are few if any differences in alcohol abuse. In general, then, it appears that a large minority of these populations will show significant aggressive psychopathology as adolescents and/or adults—and that at least a substantial minority will be indistinguishable from normal. It is important that we begin to develop some ways of distinguishing between and among these kinds of outcomes from the very beginning in order to stop making identical prognostic statements about children who are going to have very different outcomes.

Predictors of Outcome Among Probands

Moving to the consideration of the predictors of young adults' antisocial and aggressive outcomes, it is necessary to attempt to summarize the results of more than three dozen multiple regression equations. In the summary tables, each multiple regression analysis is presented on a single horizontal row. Each independent variable is presented in a single column. Where the relationship between the predictor and the outcome is positive (high scores with bad outcomes), the symbol is a '+'; where the relationship is negative (low scores with bad outcomes), the symbol is a '—'. Predictors which were significant at or beyond the p < .05 are circled; predictors significant at the $p < .10$ level are not.

   As we step back to appreciate the "complete picture", we will obviously miss some of the finer detail at this point. In this presentation, our purpose is not so much to specify the actual predictors of individual outcome variables, but rather to achieve a general test of hypotheses involving the predictive importance of different kinds of variables. We are interested, for example, in whether a set of outcomes is predicted more by individual measures describing aspects of the child's condition at referral or by ecological and familial variables describing aspects of the child's environment. When we speak of environmental variables in this context, we of course do not mean to contrast them with hereditary or genetic variables. A low score on a measure of socioeconomic status may, on the one hand, reflect the conditions and stresses under which the child has had to grow up, or it may simply indicate that the child has a father who is showing the educational and economic residuals of his own hyperactive disorder (Borland and Heckman, 1976; Morrison, 1980). Similarly, variables which quantify parental-child rearing and disciplinary practices may indicate psychological events which have molded the child's personality, or they may simply be the behavioral

manifestations of a genetic condition in the parents. Thus, we are not asking an etiological question; instead, we are asking a practical and clinical question, namely: What kinds of information from the referral period are useful in predicting differential outcome? This is an exceedingly important question and one about which our current knowledge is minimal and confused.

Predictors of Outcome on the SADS-L. SADS-L adult antisocial criteria tend to be predicted by familial and ecological variables and by childhood IQ (table 10–6). In general, less intelligent probands growing up in homes with larger numbers of children and more parental pathology were more likely to meet adult antisocial criteria. Excessive parental control (i.e., parents who describe themselves and their spouse at referral as having been too strict and too demanding) played an inconsistent role in predicting adult antisocial criteria. For variables involving occupational functioning, excessive parental control was associated with fewer signs of Antisocial Personality; parents who said at referral that they and their spouse were too strict and demanding were less likely to have hyperactive children who by young adulthood described a history of job changes, unemployment, and vagrancy. Those findings correspond with earlier work (Whaley-Klahn and Loney, 1977) suggesting that excessive control (thinking that you may be too strict as a parent) is a good rather than a bad sign. On the other hand, excessive parental control is also associated with reports of periods of drunkenness by the young adult probands. Apparent contradictions in studies of the correlates of parental firmness are not uncommon; Lewis (1981) has recently offered an explanation for them.

In the case of SADS-L alcoholism criteria (table 10–7), easily the most consistent significant predictor is childhood IQ. Children with lower IQs at referral report meeting more alcoholism criteria as young adults, and they are more likely to be diagnosed Alcoholic. Parental pathology appears to play a role in criteria involving physical violence and traffic difficulties related to drinking.

Thus, both SADS-L diagnoses in young adulthood (Antisocial Personality and Alcoholism) are related to low IQ at referral. This finding is far from surprising, since low IQ is a ubiquitous predictor of bad psychological and psychiatric outcome; however, the tendency to exclude from hyperactivity studies children with IQs below a certain pre-established level (most cutoff points lie in the 70 to 90 range) may have obscured awareness of the existence of this correlation and of its probable importance in predicting outcome (counseling children and adolescents, advising parents, and making long range treatment plans). Viewed from a slightly different angle, while it is

Table 10-6. Summary of Multiple Regression Analyses to Predict SADS-L Adult Antisocial Criteria from Selected Childhood Variables in 65 Formerly Hyperactive 21-Year-Olds

Criterion	Multiple R	Age at Referral	Age at Onset	IQ	Child Hyper-activity	Child Aggres-sion	Academic Problems	Urban Resi-dence	SES	Number of Children	Family Insta-bility	Parent Busy-ness	Parent Control	Parent Short Temper	Parent Path-ology
Occupa-tional															
Job Changes	.52	⊕											⊕		⊕
Unemploy-ment	.57		+	−					−				⊕		⊕
Adult															
Arrests	.37			⊕						+					
Fights	.37										⊕				
Drunkenness	.50	−									⊕	−	⊕	⊕	
Vagrancy	.28										⊕		⊕		
Relation-ships															
Impaired Capacity	.00														
Diagnosis	.32			⊕							⊕				

Table 10–7. Summary of Multiple Regression Analyses to Predict SADS-L Alcoholism from Selected Childhood Variables in 65 Formerly Hyperactive 21-Year-Olds

Criterion	Multiple R	Age at Referral	Age at Onset	IQ	Child Hyper-activity	Child Aggres-sion	Academic Problems	Urban Resi-dence	SES	Number of Children	Family Insta-bility	Parent Busy-ness	Parent Control	Parent Short Temper	Parent Path-ology
Month's duration	.27			⊕											
Excess drinking	.00														
Objections	.39		—			⊕				—					
Benders	.31			⊕											
Violence	.48			⊕				⊕							⊕
Traffic	.35						⊕								⊕
Police	.34	—												—	
Blackouts	.00														
Diagnosis Alcoholism	.26			⊕											

generally acknowledged that drinking and acting antisocial to the point of psychiatric diagnosis are not smart things to do, it is perhaps not as widely realized that alcoholic and antisocial groups are likely to be less intelligent than are comparable normal groups. Because this is a measure of childhood IQ, it is clear that it is an antecedent rather than a consequence of the psychopathological behavior. To some extent, a response bias may be involved again, however, such that the more intelligent probands were less likely to admit to drinking and antisocial behavior.

Predictors of Outcome on the Crime and Punishment Survey.   On the Crime and Punishment Survey (table 10–8), childhood IQ and parental overcontrol were again major predictors. The findings for childhood aggression suggest that it is children with conduct disorders who go on to more violent adult behaviors; severity of hyperactive symptomatology (i.e., overactivity, inattention, and judgment deficits or impulsivity) plays a role in crimes against property rather than in crimes against people. Thus, it would be misleading to say that hyperactive children in general grow up to be more violent than their nonhyperactive brothers, even though the CAPS outcome data (table 10–4) might appear to support such a conclusion. Instead, it is the aggressive children within the sample who appear to go on to violent adult behavior. Children who are only hyperactive are probably not at risk for violent behavior, while children who are hyperactive and aggressive or only aggressive probably are at increased risk. When all of our data are available, we will be able to estimate more precisely the exact risk among various subgroups. It seems likely from the size of these multiple correlations that improved predictions could be made at referral from consideration of presenting symptoms and background.

   The above analyses were carried out on self-reported crimes, and they may or may not be consistent with analyses of crimes as obtained from legal records. Assuming that there is not significant misreporting, the CAPS data on punishments should be comparable to official arrest data, since these are the probands' reports of the extent of their involvement with the legal system. It is therefore a form of replication that severity of police involvement is also associated with greater childhood aggression and lower childhood IQ. Since the vast preponderance of illegal and criminal behavior does not result in legal involvement of any kind, it seems necessary to have self-report data in order to arrive at a detailed picture of antisocial activity.

Predictors of Outcome on the National Survey on Drug Abuse.   Predictors of NSDA questions that indicate whether the proband has ever tried any of the seven illegal substance are summarized in table 10–9. In general,

Table 10–8. Summary of Multiple Regression Analyses to Predict Responses to the Crime and Punishment Survey from Selected Childhood Variables in 65 Formerly Hyperactive 21-Year-Olds

Traffic Violations	Multiple R	Age at Referral	Age at Onset	IQ	Child Hyper-activity	Child Aggres-sion	Academic Problems	Urban Resi-dence	SES	Number of Children	Family Insta-bility	Parent Busy-ness	Parent Control	Parent Short Temper	Parent Path-ology
Run red light	.00														
Make illegal turn	.00														
Invalid license	.43	⊖									+		⊕		
Underage Drinking	.51	⊖	⊕								⊖		+		
Drunk	.00														
Suspended license	.46							—	⊕		+		+		
Crimes Against Persons															
Owned a gun	.00														
Carried a weapon	.37						⊕						⊕		
Fight with weapon	.73	⊖					⊕				+	⊖	⊕	⊖	
Crimes Against Property															
Shoplift	.49			⊖	⊕								+		+

Table 10-8 (continued)

Traffic Violations	Multiple R	Age at Referral	Age at Onset	IQ	Child Hyper-activity	Child Aggres-sion	Academic Problems	Urban Resi-dence	SES	Number of Children	Family Insta-bility	Parent Busy-ness	Parent Control	Parent Short Temper	Parent Path-ology
Break and enter	.48			−	⊕										
Set fire	.31							⊕							
Contacts With Police											⊕				
Total sanction	.33						−						+		
Most severe	.44			−		⊕									

Table 10-9. Summary of Multiple Regression Analyses to Predict Responses to National Survey on Drug Abuse from Selected Childhood Variables in 65 Formerly Hyperactive 21-Year-Olds

Ever tried	Multiple R	Age at Referral	Age at Onset	IQ	Child Hyper-activity	Child Aggres-sion	Academic Problems	SES	Urban Resi-dence	Number of Children	Family Insta-bility	Parent Busy-ness	Parent Control	Parent Short Temper	Parent Path-ology
Marijuana	.41						⊕	+						+	
Inhalants	.54			−			⊕				⊕			+	
Cocaine	.37				⊕							−		⊕	
Hallu-cinogen	.55		⊕			⊕			+					⊕	
Opiates	.44				+				⊕				⊕		
Sedatives	.65		⊕	−		+			⊕				⊕		
Stimulants	.57								⊕				⊕		⊕

experimentation with the various illegal substances and nonmedical drugs tends to be predicted by excessive parental control, early academic problems, and urban residence. Across the entire range of substance use variables, parents' reports of excessive control at referral are associated with increased substance involvement. Inspection of the correlation matrix for referral variables suggests that this finding is not accounted for simply by the tendency of the more hyperactive children to provoke more disciplinary encounters with their parents (Barkley and Cunningham, 1979; Bell, 1968).

Summary of Predictor Findings

In general, then, for a variety of aggressive and antisocial outcomes, both individual and familial/ecological predictors play a role in young adult outcome. Chief among the individual predictors are childhood intellectual functioning and, to a lesser extent, childhood aggression. Neither of these predictors will come as any surprise to those familiar with previous work in the life history area (e.g., Robins, 1978). These data fit well with a similar study by Hechtman et al. (1981), using generally more global followup variables. Translated from the language of multiple regression and continuous symptom variables into categorical diagnostic terms, this means that the outcome of children with attention deficit disorder is likely to be affected by their initial IQ and by whether or not they have an associated conduct or oppositional disorder. Therefore children with an attention deficit disorder and a conduct or oppositional disorder must be diagnosed as having both conditions. It is important that we pay close attention to the coexistence of both conditions in our research samples, and that we study the impact of IQ.

   So far as familial and ecological predictors go, it is not astonishing that parenting styles and psychopathology played a role in the functioning of these probands as young adults, nor is it remarkable that large families and urban residence can be a negative factor. The important thing is that these ubiquitous variables have been relatively neglected in work with hyperactive children. It seems obvious that variation in relatively easily assessed environmental and familial factors is associated with a variety of crucially important outcomes.

   Thus, the suggestion ultimately is that we use these known predictors more explicitly in our operational diagnostic systems. Although it is hard to decide exactly how to incorporate intellectual, familial, and environmental data into a clinically useful and humanistically satisfying diagnostic scheme, a purely

multivariate predictive approach to these problems might be workable (Loney, 1982). The magnitude of the multiple correlations in the present study is not discouraging, especially since over a dozen years have intervened between referral and followup assessment. It is certainly clear that symptoms from the hyperactivity triad alone are not going to be a sufficient basis for the diagnostic model of childhood disorder that we would all like to have—that is, one with known precursors and describable antecedents across reasonable periods of time.

Note

1. Terminology in this area has varied across investigators and across time, bringing added confusion to an already perplexing topic. Prior to 1968, most of these children were referred to as having minimal brain dysfunction or the MBD syndrome in an attempt to deemphasize the role of psychodynamics. With the introduction of DSM-II (1968), emphasis was shifted from neurological signs and organic etiology to overt behavior, and the condition was called the hyperkinetic reaction of childhood (HK). Most recently, with the introduction of DSM-III (1980), emphasis was again shifted, this time from overactivity as the central symptom to attention deficits and impulsivity as central problems, and the condition was renamed attention deficit disorder (ADD). For the sake of simplicity, we will refer to the general MBD/HK/ADD child as hyperactive and we will reserve the presumably more specific terms for children who were prospectively diagnosed as having one of those conditions.

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II. VIOLENCE AND PSYCHOPATHY

11 CRIMINAL VIOLENCE IN A BIRTH COHORT

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Introduction

This chapter examines the criminal careers of males who commit violent offenses. The study is based on a very carefully defined, true cohort of all men born in Copenhagen from 1944–1947. The selection procedures and size of the cohort assure actual representation and guarantee a full range of police recorded offenses. We will confine ourselves to a brief description of the criminal behavior of these violent men. In particular we will report on the concentration and specialization of violence, other criminal behavior of the violent offender, and the age related characteristics of the violent offender.

   This initial brief statement on this cohort is descriptive; it aspires to report on some important long term characteristics of the criminal career of the violent male offenders in a large birth cohort. Such information may be useful in helping to understand the bases of violence and aid in the prediction of violence.

Method

Population

The present investigation studies violent offenders in a true birth cohort consisting of all male offspring ($N = 31,436$) born between January 1, 1944 and December, 31, 1947 to mothers who were residents of Copenhagen, Denmark. The cohort was originally identified by Witkin, Mednick, Schulsinger, Bakkestrom, Christiansen, Goodenough, Hirschhorn, Lundsteen, Owen, Philip, Rubin, and Stocking (1976).

Criminality

Police records.   Criminal records were obtained from the Danish National Police Files in 1974 when the subjects were 27–30 years of age. Danish criminal record keeping is "probably the most comprehensive and accurate in the Western World" (Wolfgang, 1977, p. v). The National Police Register includes information for the entire country and records all formal contact of Danish police with residents. The record includes reference to the paragraph of Danish law for each violation. Listings in the Register for missing persons or admission to a psychiatric department were excluded from our analyses. We were able to obtain complete information regarding criminality for 28,879 of the cohort who were still alive in 1974. (See Witkin et al. (1976) for details on subject attrition.) Almost all losses were because of death or emigration before the subject was 18 years of age.

Problem of hidden crime.   It is true that many criminals or criminal acts are never registered. Self-reported crime is not the same as registered criminality (West and Farrington, 1977). Recorded crime and self-reported crime, however, are proportional (Erickson, 1972). One recent study (Hindelang, Hirschi, and Weiss, 1979) has demonstrated that none of the common biases (race, sex, and social status) causes a distortion in the proportion of criminal acts which are reflected by official records. These results suggest that official records represent underlying criminality in individuals (although not all of their crimes). If any bias does occur, the hidden criminal is less serious and less recidivistic. (Christie, Andenaes, and Skerbaekk, 1965; Farrington, see chapter 3 in this volume.)

Definition of violent offenses.   For purposes of this study, the following

violations of the Danish Criminal Code are considered acts of violence: Manddrab (murder), voldtaegt (rape), vold mod offentlig myndighed (violence against authority), legemsbeskadigelse (bodily injury), vold, trussel om vold (violence, threat concerning violence), and roeveri med vold eller trussel om vold (robbery with violence or threat of violence).

Age of offense.   Since the Police Register includes specific information about the place and date of arrest, we were able to obtain information about the age of the subjects at the time of each offense. Although age at first arrest does not indicate the first time an individual committed a crime, it may reflect the relative concentration of antisocial acts in relation to age. There is a substantial literature to support the relationship of age at first arrest to seriousness of crime (McCord, in press; Ganzer and Sarason, 1973; Gibbens and Ahrenfeldt, 1966; Wolfgang et al., 1972). This pattern has also been demonstrated to be descriptive of violent offenders (Zimring, 1978; 1979; Farrington, 1979).

Seriousness of offenses.   As a measure of offense seriousness, we have constructed an ordinal scale which categorizes the seriousness of an offense by the average severity of the sanction imposed on the members of this cohort for that offense. Scores range from 0 (charges dropped) to 18 (more than median number of months in prison plus an additional penalty); see table 11–1 for examples. With this ordinal scale of sanction severity, it is possible to relate the seriousness of an individual's offenses to other aspects of his criminal career.

Results

Violent Crime Rates and Concentration

Arrests for 10,918 of the 28,879 men still living in Denmark in 1974 were recorded from the National Police Register. A small percentage (6.7%) of the arrested individuals (2.5% of the cohort) were charged with crimes involving violent behavior. Of these violent offenders (N = 735), 76.5% (N = 562) did *not* commit a second violent offense.

   Table 11–2 presents percents of the cohort who have committed zero, one, two, three, or four or more violent offenses. Also included is the percent of all violent offenses for which each subgroup is responsible. As indicated by the table, 43.4% of all violent offenses committed by the cohort were committed

Table 11-1. Examples of Seriousness of Offense Scores

Offense description	Seriousness Score
Murder	18.000
Rape	15.100
Blackmail	12.002
Embezzlement, fraud	10.549
Incest	8.832
Violence or threat of violence	8.382
Theft, house-breaking	7.575
False accusation before a court	6.167
Customs violations, smuggling	5.500
Cruelty to animals	4.308
Prostitution	3.674
Malicious damage	3.041
Failure to report to Folkeregister	2.672
Begging	1.950

by the repeat violent offenders who comprise only 1.58% of the offenders in the cohort (23.6% of the violent offenders). They represent only 0.6% of all of the men in the cohort. This degree of concentration for violent crime may be compared with the concentration for all criminal offenses. The concentration of violent offenses is greater than for offending in general (45% of all criminal law offenses were committed by 6.1% of the men in the cohort).

This degree of concentration of the cohort's violent offenses in the hands of a tiny proportion of this cohort suggests the hypothesis that these repeatedly violent individuals may specialize in violent criminal acts. The question of specialization of offenders has been of considerable interest in the literature.

Specialization

Wolfgang, Figlio & Sellin, (1972) defined specialization as occurring when crimes of the same type occur on contiguous offenses. This is a somewhat limited definition of specialization. It would (in an extreme case) exclude as specialization a case history with 12 rape-murders which alternated with 12 petty thefts. We utilize a broader definition of specialization.

We make the assumption that no specialization occurs, derive expected occurrences of violent crime based upon this assumption, and examine

Table 11-2. Distribution of Violent Offenders and Violent Crimes

Offense History	Number of Individuals	Number of Violent Offenses	Percent of Cohort	Percent of Offenders	Percent of Violent Offenders	Percent of Violent Offenses
Violent Offenders						
Number of Offenses						
1	562	562	1.95	5.15	76.50	56.60
2	126	252	0.44	1.15	17.10	25.40
3	24	72	0.08	0.22	3.36	7.20
4 or more	23	107	0.08	0.21	3.10	10.80
Non Violent offenders	10183		35.26	93.27		
Non Offenders	17961		62.19			
Totals	28879	993	100.00	100.00	100.00	100.0

whether our data deviate significantly from the expected frequencies in such a way that specialization can be said to have occurred.

With this approach, we must assume that violence occurs roughly, randomly with a given probability, $p(v)$, independent of an individual's other offenses (i.e., whether or not the individual has committed other violent offenses). Under this model, at each level of number of arrests, the expected proportion of the offenders who are violent at each level of number of violent offenses should be the same as the observed proportion. Thus, for example, the proportion of two-time offenders who have committed one violent offense should equal the expected proportion if no specialization occurs. Similarly, the proportion of three-time offenders with two violent offenses should equal the expected proportion of three-time offenders with no violent offenses, and so on, if the assumption is correct.

Given the assumption of independence (i.e., nonspecialization), the distribution of violent and nonviolent offenses follows as Bernoulli process. It can be shown that:

$$P(V = v \mid n, p(v)) = \binom{n}{v} p(v)^v p(nv)^{n-v}, \quad \text{for } 0 \leq V \leq N,$$

where $P(V = v \mid n, p(v))$ is the probability of exactly v violent offenses in n arrests. $P(v)$ is estimated as the ratio of the actual total number of violent offenses observed in the cohort to the total number of offenses recorded ($993/27111 = 0.0366$). Since the probability of nonviolence ($p(nv)$) on a given offense is complementary to the probability of violence on that offense, $p(nv) = 1.0 - p(v) = 0.9634$.

Under the assumption of independence, the expected probabilities of exactly v violent offenses, given n arrests and $p(v) = 0.0366$, are given in table 11–3 for 0 to 4 violent offenses and for $n = 1$ to 10 arrests. As the table indicates, the expected proportions of individuals recidivating in violence (2, 3 or 4-time offenders are very small. Table 11–3 also presents the observed proportions of offenders committing 0, 1, 2, 3, or 4 violent offenses by the total number of arrests. Note that the probabilities of the one-time offender being violent are lower than expected and that violence among two, three and four-time offenders is generally more likely than would be expected.

This analysis indicates that, as defined, specialization for violent offenses is observed over the criminal career of these individuals. Some investigators (Klein, in press) have suggested that specialization would not be found for juveniles. To test this hypothesis we repeated the analyses reported in table 11–3 but only included offenses before age 18. The results for the juveniles are quite similar to those which span the entire criminal career. With respect to violence, specialization (as defined) is observed in juvenile offenders. In view of the small number of violent offenders in any cohort, this finding may

Table 11–3. Expected and Actual Percents of Zero, One, Two, Three and Four Time Violent Offenders by Total Number of Arrests

Number of Arrests	Number of Violent Offenses									
	None		One		Two		Three		Four	
	A[1]	E[2]	A	E	A	E	A	E	A	E
1	98.6	96.3	1.4	3.7						
2	96.8	92.8	3.0	7.1	0.2	0.1				
3	93.0	89.4	6.1	10.2	0.9	0.4	0.0	0.0		
4	90.9	86.1	7.7	13.1	1.1	0.7	0.3	0.0	0.0	0.0
5	88.2	83.0	9.9	15.8	1.7	1.2	0.2	0.1	0.0	0.0
6	83.7	79.9	12.0	18.2	4.0	1.7	0.4	0.1	0.0	0.0
7	79.6	77.0	14.9	20.5	4.7	2.3	0.9	0.1	0.0	0.0
8	76.5	74.2	18.7	22.6	3.7	3.0	0.5	0.2	0.5	0.0
9	66.7	71.5	25.0	24.5	5.8	3.7	1.7	0.3	0.8	0.0
10	73.1	68.9	17.9	26.2	5.2	4.5	3.7	0.5	0.0	0.0
t	3.11		5.97		6.25		2.09		1.43	
p	<.01		<.0001		<.0001		<.05		n.s.	

[1]The columns marked "A" contain the actual percents of individuals under the conditions indicated.
[2]The columns marked "B" contain the expected percents of individuals.

be seen as only modifying the more general case for lack of specialization for the bulk of juvenile offenders. Additional analyses with this cohort concerning specialization in other types of offenses will be reported in the future (Van Dusen, et al.).

Type of Violent Crime

The percent of offenders committing each of five types of violent offenses is given in table 11–4 as a function of number of violent offenses committed. The bulk of the violent offenses are assault and robbery. If an individual had been arrested at least three times for violence, at least one of those arrests was for assault. The percentages for rape are small, but the proportion decreases as a function of level of recidivism.

Other Offenses by Violent Offenders

Violent offenders tended to commit more crimes than other offenders in our cohort, an average of 7.76 compared to an average of 2.61 offenses for the nonviolent offenders ($t(758) = 22.69$, $p < .0001$). The repeat violent offenders have a higher number of total offenses than do one-time violent offenders ($t(259) = 8.32$, $p < .0001$). Table 11–5 presents the mean number of each of the various types of offenses committed by nonviolent offenders and by one, two, and three or more time violent offenders. Every type of crime is more likely to be committed by someone who also is responsible for a violent crime. Even the one-time violent offender is likely to have committed 3.66 property offenses. The results reported in the table also demonstrate that the more times an individual is violent, the more often he will have committed a variety of crimes. Thus while specialization for violence is observed, it is also true that the violent offender has a heightened probability of committing all other types of offenses. To further illustrate this point, we note that the violent offenders (2.5% of the cohort) are responsible for 17% of the cohort's crime. The repeat violent offenders (0.6% of the cohort) are responsible for 5% of the crime in the cohort.

Offense Number

Table 11–6 presents the percent of individuals who have committed a violent offense as function of total number of offenses. As might be expected, it

Table 11-4. Percentages of One, Two, and Three or More Time Violent Offenders Responsible for each Category of Violence

Violent Offense Type	Percent of One Time Violent Offenders	Percent of Two Time Violent Offenders	Percent of Three or More Time Violent Offenders
Murder	0.7	3.2	0.0
Rape	3.7	2.4	2.0
Robbery	15.7	28.8	36.1
Aggravated Assault	3.4	5.8	4.2
Assault	76.5	92.1	100.0
N	562	126	47

Note: Percentages sum to more than 100 because multiple violent offenders can be responsible for more than one type of violence.

Table 11-5. Mean Number of Offenses for Violent and Nonviolent Offenders by Type of Offense

	Type of Offender			
Type of Offense	No Violent Offense	One Violent Offense	Two Violent Offenses	Three of More Violent Offenses
All Charges	2.61	6.41	10.54	16.45
Theft (Including Burglary)	.69	2.65	4.16	6.59
Auto-Bike Theft	.27	.96	1.27	2.00
Receiving Stolen Property	.07	.24	.44	.72
Sex Offenses	.01	.02	.05	.13
Other Offenses	.26	.63	.88	1.08
All Property	.97	3.66	5.50	8.65
All Nonindex	.75	2.10	3.67	4.21
All Index	.96	4.66	7.47	12.44
N	10918	562	126	47

Note: Numbers reflect mean number of arrests for which the type of offense indicated was the most serious charge recorded, expect for the "All Charges" line. There, the numbers reflect the mean number of charges (over all arrests) for the individuals.

Table 11-6. Violent Offending as a Function of
Recidivism

Number of offenses	Percent of offenders committing at least one violent act
1	1.45
2	1.98
3	2.63
4	3.24
5	4.10
6	4.43
7	4.67
8	5.72
9	4.31
10	4.08
11	4.21
12	6.18
13	6.31
14	7.28
15	6.12
16	6.63
17	7.92
18	9.30
19	10.38
20	8.29

becomes more likely that an individual will be violent if he commits many offenses. About 10% of the men credited with 18 or more offenses have committed at least one violent act.

Seriousness of the Violent Offender

The violent offender in our cohort is a more serious offender. As indicated above, we have defined a seriousness of offense measure using the magnitude of the average sanction imposed by the Danish Justice System for charges of each type. Mean sum of seriousness scores are presented in table 11-7 for the nonviolent, one time violent, two time violent, and three or more time violent offenders. These figures include the seriousness scores for the violent offenses; when the violent offense scores are removed the pattern does not

change. Note that the mean seriousness per offense is not highly related to degree of violent offending. The greater seriousness of violent offender's total career is increased by the greater number of offenses in which he engages.

Age Factors

In this cohort, the rate of violence is 2.5% by ages 15 and 16. It then rises sharply to over 8% by age 18 and remains at that level until it reaches 9% at 25 years of age. After 25 years of age the rate of violence drops sharply. It falls to 1% by 28 years of age. The majority (70%) of the violent offenses in the cohort occurred between the ages of 18–25 years of age. The peak age for violent offending is 20 years of age. This may be compared with the peak age of 17 years for all offenses.

Table 11–8 presents the mean number of crimes of violence expected at some time in a criminal career as a function of age of first arrest. As age at first arrest increases, the probability of further violence decreases. Those individuals who were arrested before age 16 were much more likely to be arrested later for criminal violence than were those first arrested at a later age.

The interaction of the age of the individual and his prior arrest history in predicting future violence is suggested by the results presented in figure 11–1, where the percentages of individuals committing a future violent offense are plotted by reference age and previous arrest history. The figure suggests that the earlier the age at which the subject has accumulated one, or two or more arrests, the greater the probability of future violence. The differences

Table 11–7. Mean Sum of Seriousness Scores for Nonviolent and One, Two, and Three or More Time Violent Offenders

Category of Offenses	Nonviolent Offenders	One Time Violent	Two Time Violent	Three or More Time Violent
All Charges	17.05	53.72	84.42	130.08
Only Index Offenses	6.37	33.89	56.33	93.49
Mean Seriousness score per offense	6.5	7.2	7.3	7.3
N	10918	562	126	47

Table 11-8. Mean number of violent crimes committed in a criminal career as a function of age at first arrest

Age at first arrest	Mean number of violent offenses in entire career
8–10	.25
11–13	.24
14–16	.22
17–19	.11
20–22	.04
23–25	.03

are significant at all ages, but the greatest difference occurs at age 20 with steady decline thereafter. It is worth noting that more than 20% of the individuals who were recidivists by the age of 18 later evidenced violent crime as adults.

Discussion

Our exploration of the violence in this cohort has revealed that violent offenders differ from nonviolent offenders on some criminal behavior characteristics. Although recidivistic violent criminals are few, these individuals are responsible for a large portion of violent crime and a significant percentage of crime in general. The recidivistic violent offender is an especially antisocial individual, committing, in addition to his violent acts, more than his share of all other major types of crime as well. Violent offenders also begin committing crime at an earlier age and tend to commit offenses over several years before the onset of violence. Despite the variety of offenses they commit, the violent offender tends to be a specialist.

This is a preliminary report on the violence in this cohort. In future papers we hope to consider the possibility of the prediction of violence by some combination of early criminal career, personal and social characteristics. It would seem that the pronounced recidivism of individuals who have committed violent offenses might help in such prediction. It should be recalled (table 11–6), however, that among those chronic criminals who have more than 15 officially recorded offenses, over 90% have not committed a single officially recorded violent act. This preliminary analysis clearly does not encourage predicting violence from number of other criminal acts. Figure
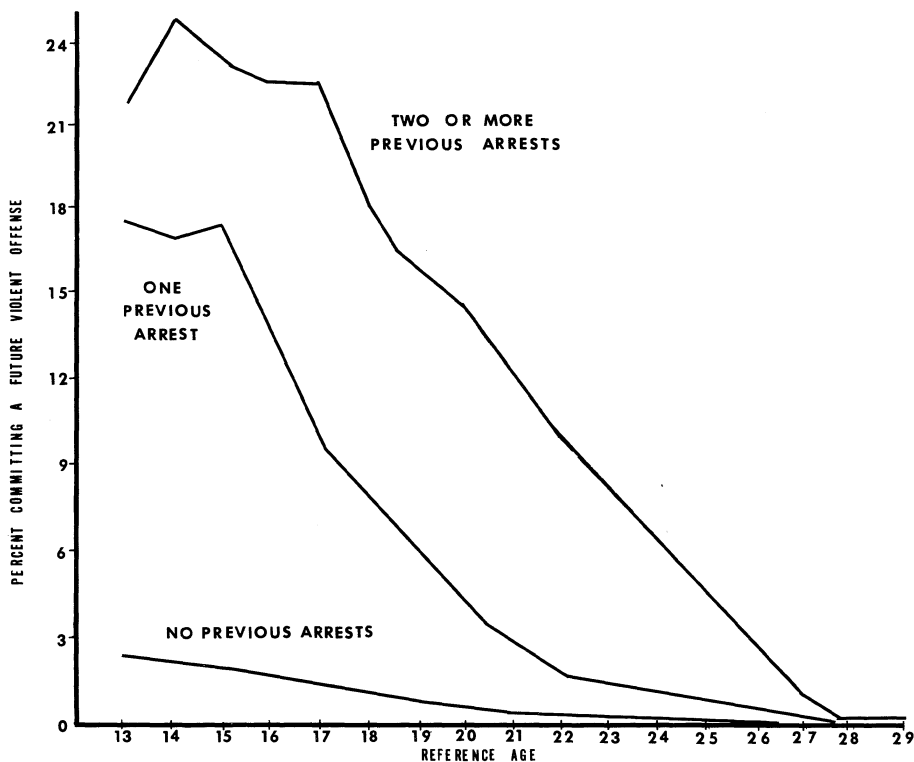
Figure 11–1. Probability Interaction of the Age of the Individual and Prior Arrest History

11–1 indicates that combining number of offenses with age factors may aid in prediction. Here again, however, it must be emphasized that even among those committing two offenses before age 18, about 80% do not commit a violent offense during the remainder of their criminal career.

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12 CRIMINAL HISTORY OF THE MALE PSYCHOPATH: SOME PRELIMINARY DATA

Robert D. Hare and Jeffrey W. Jutai

Introduction

This is a brief report on the first stage of a longitudinal study of criminal psychopathy. The data to be presented are the criminal records of several hundred predominantly white, male criminals who took part in at least one of our psychophysiological studies from 1964 to 1974. The records were obtained from the RCMP Fingerprint Service (FPS) files, which contained a listing of charges, convictions, and dispositions from the time of first appearance in adult court until December 31, 1975. A later report will describe the criminal histories of around 500 male criminals from their first appearance in adult court until 1982.

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Assessment of Psychopathy

The procedures used for the assessment of psychopathy have been described in detail elsewhere (Hare, 1970, 1980; Hare and Cox, 1978), and only a brief outline is given here. Our assessments are based on the "clinical profile" of the psychopath provided by Cleckley's "The Mask of Sanity", first published in 1941 and now in its fifth (1976) edition. Although Cleckley lists 16 criteria for the diagnosis of psychopathy, principal components analysis (Hare, 1980) indicates that they can be reduced to five sets of interrelated items or factors. A brief description of these factors is given in table 12–1, along with five factors derived from principal components analysis of a recently developed 22-item checklist for the assessment of psychopathy in criminal populations.

In the 1960's we placed inmates into three groups—psychopaths (P), mixed (M), nonpsychopaths (NP)—according to how well their personality and behavior over a long period of time were consistent with the Cleckley criteria for psychopathy. During the last 10 years our procedure has been to order inmates along a 7 point scale according to how well they satisfy the

Table 12–1. Summary of Factors Derived from Principal Components Analysis of the Cleckley Criteria for Psychopathy And A 22–Item Psychopathy Checklist[a]

Factor[b]	Cleckley Criteria	Psychopathy Checklist
1	Inability to develop warm, lasting relations with others, lack of empathy, callous disregard for rights and feelings of others	Impulsive, unstable life-style, no long term plans or commitments
2	Unstable, transient life-style, no long term plans or commitments	Self-centeredness, callousness, lack of empathy and concern for others
3	Inability to accept responsibility for persistent antisocial behavior	Superficial relationship with others
4	Absence of clinically significant intellectual or psychiatric symptoms	Early appearance of chronic antisocial behavior
5	Weak or unstable behavioral controls	Impulsive and inadequately motivated criminal acts

Canonical correlation between the Cleckley and checklist factors = .90

[a]From Hare (1980).
[b]After varimax rotation.

Cleckley criteria. This rating system has high interrater reliability (r's of around .90) when used by experienced investigators, and has proven useful in research on the psychophysiology of psychopathy (e.g., Hare, 1978). For research purposes we usually average the ratings of two or more investigators; these averaged ratings are then used to divide inmates into low (mean ratings of 1–3), medium (3.5–5.5), and high (6–7) psychopathy groups. The low and high psychopathy groups can be considered to be the equivalent of the NP and P groups used in the 1960's. In some of the earlier studies the data of Group M were not analyzed in detail; in order to retain reasonable sample sizes the analyses to be presented here are confined to extreme groups, i.e., the NP and P groups in the earlier years, and the low and high psychopathy groups in the later years. For convenience, these extreme groups are referred to as Group NP (nonpsychopaths; N = 96) and Group P (psychopaths; N = 97).

Although our 22-item checklist was not available when the assessments for psychopathy were made, recent work with very similar groups of inmates indicates that Groups NP and P probably would have had mean checklist scores of around 20 and 35, respectively. Checklist scores are very reliable and are highly correlated with ratings of psychopathy (Hare, 1980; Schroeder, Schroeder and Hare,);[1] factors derived from principal components analysis of the Cleckley criteria and the checklist items are also highly correlated.

Psychiatric diagnoses were not available for Groups NP and P. However, recent research with very similar groups of inmates (Hare, 1983) suggests that most of the inmates in Group P would have met the criteria for Antisocial Personality Disorder listed in the Diagnostic and Statistical Manual (DSM–III) of the American Psychiatric Association (1980). Most of the inmates in Group NP would have met the DSM-III criteria for Adult Antisocial Behavior or Conduct Disorder. Perhaps as many as half of the inmates in each group also would have received a diagnosis of Substance Use Disorder.

When first assessed for psychopathy all of the inmates were confined in a federal maximum or medium security institution where sentences of two years or more are served. At that time there were no significant demographic differences between Groups P and NP. Mean age, years of formal education, and Revised Beta IQ were, respectively, 28.7, 9.2, and 106.7. Most of the inmates were from the lower socioeconomic levels. In terms of the Hollingshead Occupation Scale, about 60% could be classified as unskilled (level 7), 16% as semiskilled (level 6), and 24% as skilled or better (levels 5 to 1).

The Analysis Period

The mean age of first appearance in adult court was 18.1 years for Group P and 20.0 for Group NP, a statistically significant difference ($p < .01$). Almost 40% of the subjects in Group P first appeared before the age of 17, whereas only 19% of Group NP did so ($p < .01$). The average length of time over which criminal history data were analyzed (first appearance in adult court to December 31, 1975) was 11.12 years.

Criminal Charges During Analysis Period

The mean number of criminal charges for various types of crimes committed (per year free) during the analysis period is presented in table 12–2. Group P received significantly more charges for theft, robbery, assault, possession of weapons, and escape, and fewer charges for narcotics offenses, than did Group NP. Group P also received more charges overall, and more charges for violent crimes, than did Group NP. About 18% of the total charges against Group P were for crimes in which some degree of violence was involved, compared with about 9% of the charges against Group NP. Group

Table 12–2. Mean Number of Criminal Charges Per Year Free During the Analysis Period

Type of Offense	Group P (N = 97)	Group NP (N = 96)	p
Theft, possession, B & E	2.44	1.16	< .001
Robbery	.26	.04	< .01
Fraud, forgery, etc.	.92	.69	< .10
Murder, attempted murder	.02	.01	—
Assault	.27	.10	< .05
Possession weapons	.22	.06	< .05
Driving	.17	.19	—
Narcotics	.21	.52	< .01
Escapes	.21	.09	< .05
Miscellaneous	.34	.40	—
Total Charges	5.06	3.25	< .001
(Violent)	.91	.27	< .05
(NonViolent)	4.15	2.98	< .001

[a]Two-tailed t test; df = 191.

P was also more versatile (less specialized) than was Group NP, being charged with twice as many different types of crime than was Group NP ($p < .01$).

Some additional data are of interest here. During the analysis period, almost twice as many subjects in Group P used an alias when arrested than did those in Group NP ($p < .01$). About 38% of the subjects in Group P and 26% in Group NP received at least one parole during the analysis period, a significant difference ($p < .001$). Almost 75% of the paroles given to each group were violated, and, on average, after only about 35% of the parole had been completed.

Age of First Contact.   There is some evidence that age of first contact with the judicial system is a good predictor of subsequent criminal behavior (see review by Petersilia, 1980). In the present study, the correlation between age of first appearance in adult court and total number of charges per year free was $-.08$ (n.s.). It is unlikely, therefore, that the group differences in criminal charges were due to differences in age of first appearance in adult court. As an additional check, however, an analysis of covariance was performed, with age of first adult appearance as the covariate, and total charges per year as the dependent variable. The results of this analysis clearly indicated that even when the effect of age of first adult appearance is removed, the obtained difference between groups in total charges per year remains significant

$$(F = 7.92, df = 1/1.89, p < .005)$$

It is possible that the age of first police contact (rather than first appearance in adult court) would have been correlated with subsequent criminal activity in this study. However, information on police contacts prior to first appearance in adult court was not available to us.

Longitudinal Analyses

The analyses in this section are concerned with group differences in criminal history, beginning at age 17. The length of the analysis period was 15 years (to age 31) for 110 subjects, 20 years (to age 36) for 65 subjects, and 25 years (to age 41) for 38 subjects. Each of these three periods was broken down into 5 year intervals. The mean number of months that each group was free (i.e., not in prison) during each age interval and each analysis period is presented in table 12–3. Separate analyses of variance with repeated measures were performed on data in the three analysis periods; significant

effects are listed in table 12–3, below the data for each period. The results of each analysis period were essentially the same: Group P was free less time than was Group NP, and both groups were free more after age 21 than before. There was a tendency for the difference between groups to increase with age, but none of the Group × Interval interactions was significant.

Since there were group and interval differences in time free (and in the opportunity to commit crimes), the mean number of charges for crimes committed during each 5-year interval was converted to the number of charges per year free during the interval.

15 Year Period

The mean number of charges per year free against 110 subjects who were at least 31 years old in December, 1975 is plotted in figure 12–1. Analysis of variance with repeated measures indicated that the difference between groups over the three age intervals was significant

$$(F = 6.51, df = 1/108, p < .05).$$

There was a tendency for the groups to differ in the linear component of trend, with Group P showing an increase in charges over the three intervals, and Group NP a decrease

Table 12–3. Mean Number of Months Free (Not in Prison) During Each Age Interval in the 15, 20, and 25 Year Analysis Periods

	15 Year Period		20 Year Period		25 Year Period	
Age Interval	Group P	Group NP	Group P	Group NP	Group P	Group NP
(N)	(49)	(61)	(31)	(34)	(21)	(17)
17–21	26.2	28.3	24.5	31.8	26.7	33.2
22–26	35.3	39.8	36.6	42.2	39.0	44.9
27–31	39.1	38.0	29.2	39.9	31.2	41.4
32–36			26.2	37.9	24.9	40.2
37–41					25.1	39.4
Significant Effects[a]	Group, $F(1,108) =$ 5.32, $p < .05$ Interval, $F(2,216)$ $= 22.24, p < .001$		Group, $F(1,63) =$ 10.50, $p < .05$ Interval, $F(3,189)$ $= 10.09, p < .001$		Group, $F(1,36) =$ 6.64, $p < .05$ Interval, $F(4,144)$ $= 6.28, p < .001$	

[a]Based on analysis of variance with repeated measures.
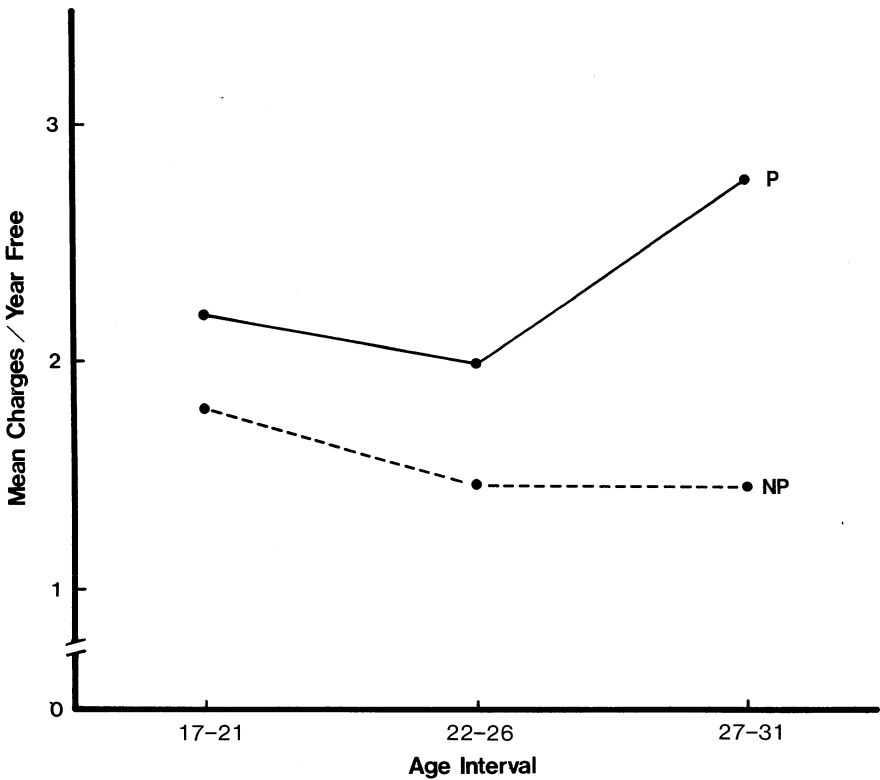
Figure 12-1. Mean number of charges per year during the 15 year analysis period (N = 49 for Group P and 61 for Group NP).

$$(F = 2.87, df = 1/108, p < .10).$$

20-Year Period

The mean number of charges per year free against 65 subjects who were at least 36 years old in 1975 is plotted in figure 12-2. The main effect for groups was significant

$$(F = 14.17, df = 1/63, p < .001)$$
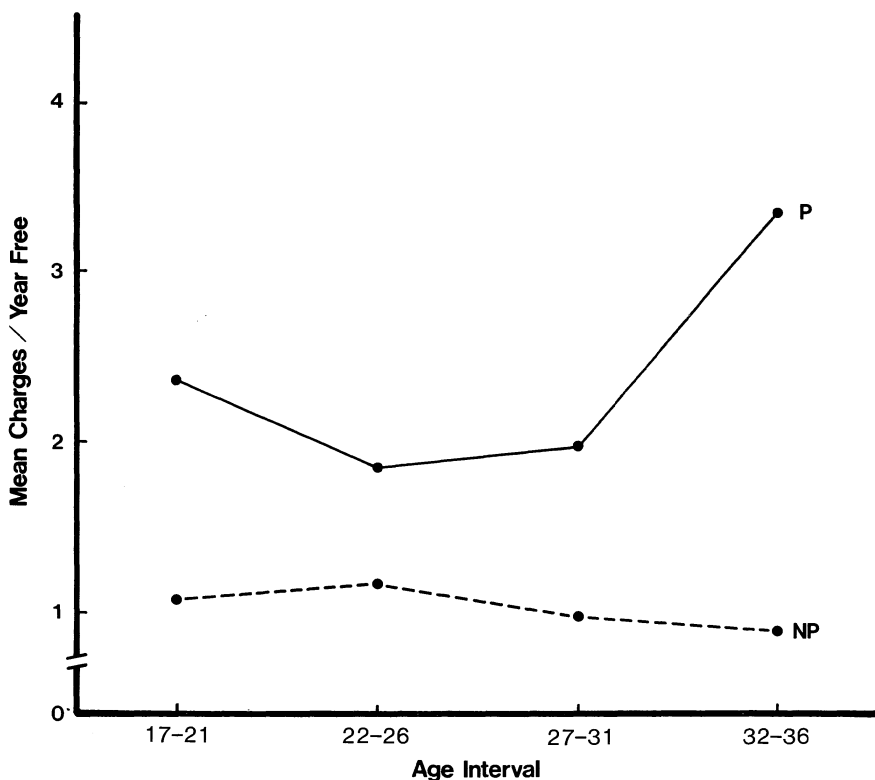
Figure 12–2. Mean number of charges per year free during the 20 year analysis period (N = 31 for Group P and 34 for Group NP).

with Group P receiving more charges over the four age intervals than did Group NP. The Group $\times$ Interval interaction

$$(F = 2.74,\ df = 3/189,\ p < .05)$$

and the group difference in quadratic trend

$$(F = 6.97,\ df = 1/63,\ p < .05)$$

confirm what is apparent in figure 12–2: the number of charges received by Group NP peaked at an early age and then began to decline, while those received by Group P were still increasing by age 36.

25-Year Period

The mean number of charges per year free against 38 subjects who were at least 41 years old in 1975 is plotted in figure 12–3. The main effect for groups was significant

$$(F = 9.04, df = 1/36, p < .01)$$

with Group P receiving more charges over all five age intervals than did group NP. Both the Group × Interval interaction

$$(F = 2.63, df = 4/144, p < .05)$$
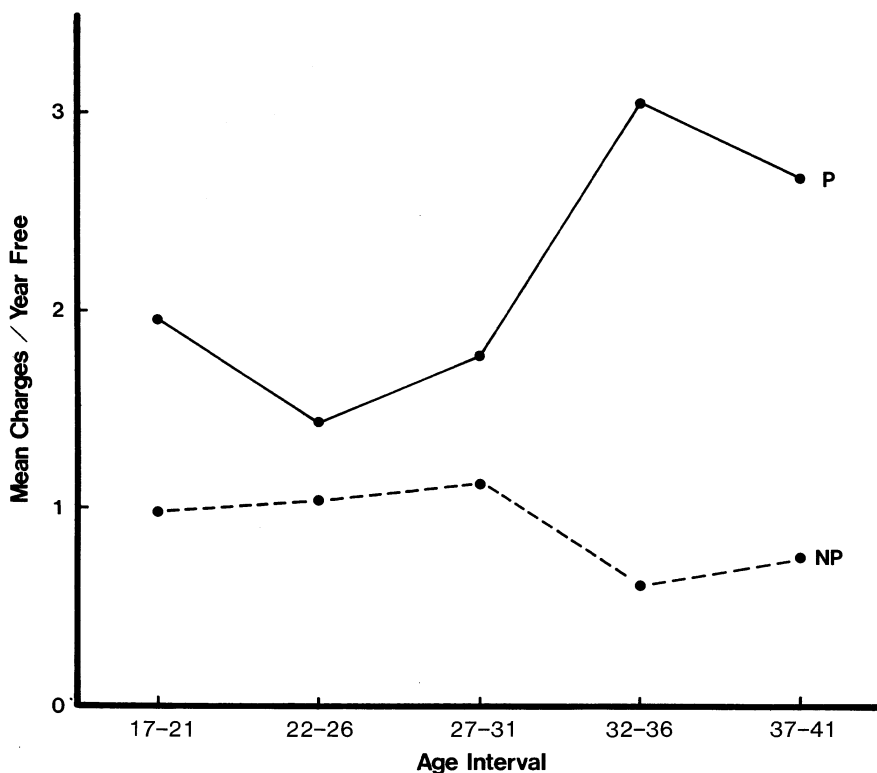
Figure 12–3. Mean number of charges per year free during the 25 year analysis period (N = 21 for Group P and 17 for Group NP).

and the difference between groups in cubic trend

$$(F = 6.13, df = 1/36, p < .05)$$

were significant. As figure 12–3 indicates, the number of charges against Group NP reached a peak by age 31 and then decreased, while those of Group P declined slightly between 21 and 26, and then increased sharply before peaking by age 36.

Composite Analysis

Unfortunately the number of subjects involved in the 20 to 25 year analysis periods was not very large, simply because most of the original pool of 193 subjects were not very old at the end of the followup period (December, 1975). As we continue to gather more data (in the next phase, to July, 1982) it will be possible to increase the number of subjects whose criminal history is followed over a longer period of time. Until this is done, some indication of what may happen can be gained by combining the data in figures 12–1–3 into a single, composite figure. This is done in figure 12–4; note that the data in age intervals 4 and 5 are based upon a smaller number of subjects than are those in intervals 1–3. This limitation notwithstanding, it seems reasonable to conclude that the criminal activity of Group P peaks at a much later age than it does for Group NP.

Versatility of Criminal Activity

The number of different types of charge within a given age period was used as a measure of the versatility of criminal behavior. Group P was generally about twice as versatile as was Group NP ($p < .01$) a ratio that did not vary appreciably throughout the 15, 20, and 25 year analysis periods.

The number of subjects involved was not large enough to perform meaningful comparisons between Groups P and NP on differential changes in the incidence of specific types of crimes throughout the three analysis periods.

"Burn-Out" In Psychopaths

Robins (1966; see also review by Suedfeld and Landon, 1978) has suggested that the antisocial behavior of sociopaths often decreases in severity after the
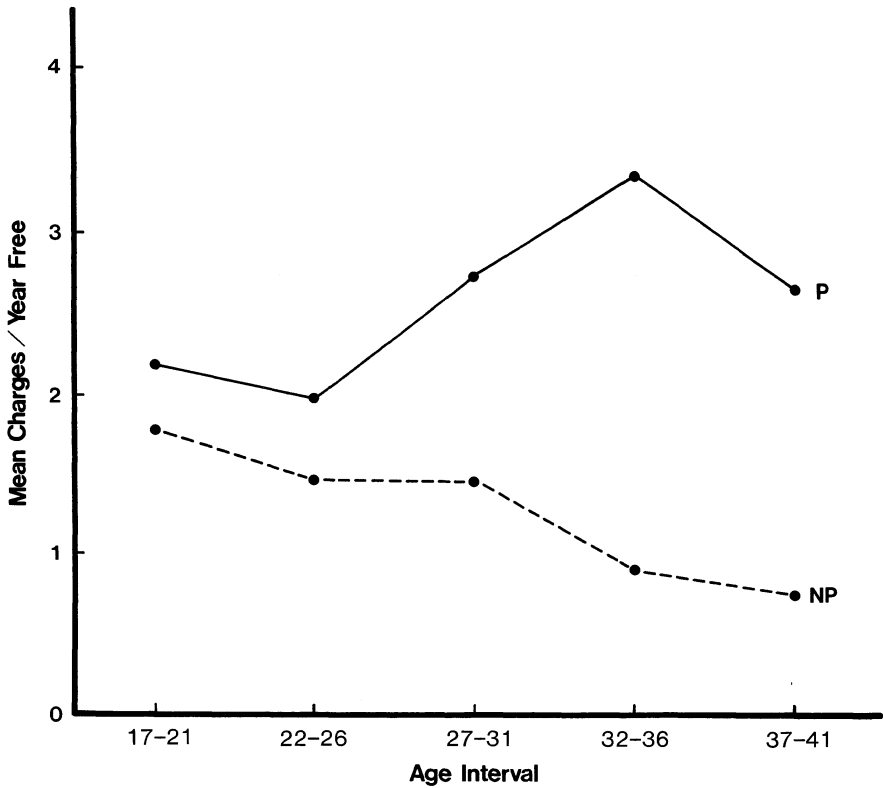
Figure 12–4. Mean number of charges per year free, using data from the 15, 20, and 25 year analysis periods. The Ns for age intervals 1–3, 4, and 5 are the same as those in figures 12–1, 12–2, and 12–3, respectively.

age of 30. Similarly, clinicians frequently comment on the tendency of psychopaths to "burn-out" around age 30 or 35. However, the data presented above clearly indicate that it is the nonpsychopathic criminals, and not the psychopaths, who show an early decline in criminal activity (see also Petersilia, 1980). The criminal activity of the psychopaths (as reflected in charges per year free) continued to increase for at least five years after that of the other criminals had started to decline. If psychopaths do in fact burn out, they appear to do so later than do other criminals. Moreover, even with the decline that occurred between the ages of 37 and 41 (see figures 12–3 and 12–4), the psychopaths still received more than twice as many charges as the

nonpsychopaths did at their peak. Whether a much sharper decline in charges will occur as the psychopaths approach age 45 or 50 remains to be seen.

Note

1. Schroeder, M.L., K.G. Schroeder and R.D. Hare. 1982. *Generalizability of a checklist for assessment of psychopathy*. Paper presented at the annual meeting of the Canadian Psychological Association, Montreal.

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13 TESTOSTERONE IN THE DEVELOPMENT OF AGGRESSIVE ANTISOCIAL BEHAVIOR IN ADOLESCENTS

Dan Olweus

Introduction

Recent studies of the relationship between plasma testosterone levels and aggressive and antisocial behavior in the human male have yielded somewhat conflicting results. Positive associations have been found between testosterone levels and some of the aggressive and antisocial/criminal dimensions studied (Doering, Brodie, Kraemer, Moos, Becker, and Hamburg, 1975; Ehrenkrantz, Bliss, and Shepard, 1974; Kreuz and Rose, 1972; Persky, Smith, and Basu, 1971; Rada, Laws, and Kellner, 1976), while negative findings have also been obtained with related dimensions in the same or other studies (Doering et al., 1975; Ehrenkrantz et al., 1974; Kreuz and Rose, 1972; Meyer-Bahlburg, Boon, Sharma, and Edwards, 1974; Monti, Brown, and Corrivean, 1977; Rada et al., 1976). Although the results on the human males thus are not clear cut, they suggest, when combined with findings from

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animal studies (see e.g., Moyer, 1976; Rose, 1975), that there may be a positive relationship between plasma testosterone levels and one or more aspects of aggressive, impulsive and antisocial behavior patterns.

The study reported in this chapter was conducted on a sample of normal adolescent Swedish boys and covered a broad range of aggressive and related dimensions, including self confidence, impulsivity, and antisocial behavior, and used several methods of measurement. Only some of the main findings from this study will be discussed here; for additional information the reader is referred to Olweus, Mattson, Schalling, and Löw (1980).

If a positive relationship is found between testosterone level and a particular aggressive or antisocial dimension (and this relationship can be given a causal interpretation), it becomes essential to try to find out what the mechanisms mediating the relationship are. It is also of great interest to get an idea of the relative importance of the possible influence of testosterone on behavior. To highlight this issue, it is essential to have data on individual differences in the relevant behavior dimensions before production of testosterone (in sizable quantities) is initiated as well as after it has been going on for some time. General information on the stability over time in the behavior dimensions studied may be helpful too. Such information is available in the present project and some findings and thoughts related to these issues will be presented toward the end of the chapter.

Procedure and Findings in Empirical Study

The subjects of this study were 58 healthy boys, 15 to 17 years old, with a median age of 16. They were selected from the public school districts of Solna, a suburb in the Stockholm metropolitan area in Sweden, to provide a roughly random sample of the total male student population of grade 9 (about 275 boys). The boys provided two sets of blood samples (separated by approximately one month) for plasma testosterone assays. The test-retest reliability or the stability of the individual differences, as expressed in the correlation between the two sets of measurements, was .63. The reliability of the individual average testosterone levels was .77 (Spearman-Brown corrected). The mean testosterone value for the whole group was 544. ± 141 ng/100 ml (range 197-901 ng/100 ml).

Of the 58 boys, 3 were in Tanner pubertal stage 3, 9 in stage 4, and 43 in stage 5 (adult) according to pubic hair development. The correlation between pubertal stage and testosterone level was .44.

Approximately one month before the blood samples were drawn, the subjects completed a number of personality inventories (see table 13–1 and Olweus et al., 1980). In addition, highly reliable peer ratings of habitual aggressive behavior and physical strength were available. Data on physical variables such as height, weight, chest circumference, pubertal stage were collected in a physical examination.

Table 13–1. Correlations Between Individual Testosterone Levels and Inventory Scales and Rating Dimensions (n = 58)

Scale	Correlation coefficient (r)[a]
1. From Olweus Aggression Inventory	
Physical Aggression	.36[xxx]
Verbal Aggression	.38[xxx]
Physical + Verbal Aggression	.44[xxx]
Aggressive Attitude and Impulses	.10
Aggression Inhibitory Responses	−.03
Preference for Physical Sports	.03
2. From Olweus Q Inventory	
Aggression	.10
Self-Confidence (Toughness)	.18
Feelings of Maladjustment and Inadequacy	−.08
Closeness to Parents	−.20
3. Lack of Frustration Tolerance	.28[x]
Antisocial Behavior	.17
4. From Thurstone Temperament Schedule	
Vigorousness	.09
Tempo	.10
5. From Eysenck Personality Questionnaire	
Extraversion-Impulsivity	.06
Extraversion-Sociability	.08
Extraversion (total)	.13
Psychoticism	.15
6. Impulsiveness	.16
Montony Avoidance	.22
7. From Multi-Component Anxiety Inventory	
Somatic Anxiety	.03
Psychic Anxiety	.10
Muscular Tension	.07
Anxiety (total)	.07

Table 13-1 *(continued)*

Scale	Correlation coefficient (r)[a]
8. From California Psychological Inventory (CPI)	
Socialization scale	−.18
9. Rating Scales	
Start Fights	.16
Verbal Protest	.24[x]
Verbal Hurt	.14
Composite of all 3 scales	.21
Aggression Target	.00
Unpopularity	.02
Feelings of Being a Failure	.17
Composite of all 3 scales	.06
Physical Strength	.04

[a]On a two-tailed test ($df = 56$), correlations of .26 and .34 are needed for significance at the .05 (x) and .01 (xx) levels, respectively. On applying a one-tailed test (for the Aggression, Self Confidence, lack of Frustration Tolerance, Antisocial Behavior scales and the first three rating scales), the corresponding values are .22 and .31. A correlation of .34 is then significant at the .005 level (xxx).

Testosterone and Aggression

As evident from table 13–1, there was a substantial correlation between testosterone and each of the two behavioral scales, Verbal Aggression ($r = .38$) and Physical Aggression ($r = .36$), of the Olweus Aggression Inventory. The simple composite of these two scales correlated .44 with testosterone.

At the same time, it should be noted that the two somewhat related scales of the Q Inventory, Aggression and Self Confidence (Toughness), did not correlate significantly (although positively) with testosterone. In addition, the scale Aggressive Attitude and Impulses, referring to inner tendencies, from the Olweus Inventory showed only a weak correlation with testosterone levels.

Closer analysis of the individual items of the Verbal and Physical Aggression scales revealed an interesting pattern: It was primarily items involving a response to provocation, including threat or unfair treatment, that showed a clear correlation with testosterone levels (table 13–2). The first eight items of table 13–2 all contain an element of provocation, by adults or

Table 13–2. Correlation Between Testosterone Levels and Individual Items from the Verbal and Physical Aggression Scales (N = 58)

Item	Correlation coefficient (r)
Verbal Aggression (5 items)	
1. When an adult is unfair to me, I get angry and protest	.18
2. When an adult tries to take my place in a line, I firmly tell him it is my place	.24
3. When a teacher criticizes me, I tend to answer back and protest	.33
4. When a teacher has promised that we will have some fun but then changes his (her) mind, I protest	.19
5. When an adult tries to boss me around, I resist strongly	.33
Physical Aggression (5 Items)	
6. When a boy starts fighting with me, I fight back	.33
7. When a boy is nasty with me, I try to get even with him	.37
8. When a boy teases me, I try to give him a good beating	.15
9. I fight with other boys at school[a]	.05
10. I really admire the fighters among the boys[a]	.11

[a]These items do not contain a clear element of provocative challenge.

peers. The correlations with testosterone were quite high for several of these items, considering the fact that the reliability of individual items is generally rather low. Conversely, the correlations for the last two items which do not imply provocation were negligible.

In addition, the only peer rating scale containing an element of provocation, Verbal Protest, showed the highest correlation $(r = .24)$ with testosterone. The wording of this rating dimension was as follows: "When a teacher criticizes him, he tends to answer back and protest".

Summarizing the findings above, it appears that dimensions reflecting intensity and/or frequency of aggressive responses to provocation and threat were most clearly related to testosterone. Other dimensions measuring aggressive attitude or impulses and unproved physical or verbal aggression showed only fairly weak positive correlations with testosterone.

When the above findings are compared with those of previous studies, it

should be noted that the use of self-report scales have produced inconsistent results. For instance, Persky et al. (1971) obtained a clear positive correlation between the Buss-Durkee Factor II (Aggression Factor) scale and plasma testosterone levels (and testosterone production rate) using a small sample of 18 young men (average age = 22 years). Other studies using the Buss-Durkee Inventory have failed to obtain significant relationships with testosterone (Doering et al., 1975; Ehrenkranz et al., 1974; Kreuz and Rose, 1972; Meyer-Bahlburg et al., 1974; Monti et al., 1977; Rada et al., 1976). When viewed from the present perspective, these results may not be too surprising. The Buss-Durkee Factor II is a composite of four subscales, called Assault, Indirect Aggression, Irritability, and Verbal Aggression (Buss & Durkee, 1957), and is relatively heterogeneous with regard to content. Closer analysis of the subscales reveals that none of them is particularly designed to measure response to provocation or threat and the inventory contains only a small number of items of this kind. In addition, relatively little is known about the validity of the Buss-Durkee Inventory. With regard to the Physical and Verbal Aggression scales of the Olweus inventory, validity coefficients (uncorrected for attenuation) in the .40 to .60 range have been obtained in several studies (Olweus, 1973, 1975), using independent peer ratings of aggressive behavior as criteria. Also in the present study, validity coefficients of this order were found. On the basis of the present results, then, it appears that validated self-report scales which are focused on particular aspects of aggression may be substantially related to testosterone levels.

It should be emphasized, however, that the Olweus Aggression Inventory was developed for use on boys in the 12–16 year age range (Olweus, 1975). It is probably more difficult to get valid indicators of adults' aggressive motive systems, in particular if the subjects constitute a selected sample with a restriction of range in the behaviors of interest.

Considering the research literature on testosterone-aggression relationships, no previous studies on humans seem to have focused on the aspect of aggression found to be of particular relevance in the present study. There are, however, two results that may be mentioned in this context. First, in another study conducted by the present authors (Mattsson, Schalling, Olweus and Löw, 1980), examining 40 institutionalized male delinquents, one of the highest correlations ($r = .38$, $p < .05$) was obtained for the relationship between testosterone levels and the sum of two items selected from the Verbal Aggression scale of the Olweus Aggression Inventory (both items involving provocation). Second, in a preliminary study (Scaramella and

Brown, 1978) a correlation of .55 ($p < .05$) was found between testosterone and ratings of responsiveness to threat in a small group of hockey players ($N = 14$).

Testosterone and Frustration Tolerance

As shown in table 13–1, there was a positive correlation ($r = .28$) between testosterone levels and the self-report scale called Lack of Frustration Tolerance. This scale contained only three items, all of them focusing on the individuals' habitual level of impatience and irritability ("I become easily impatient and irritable if I have to wait"; "Others say that I easily lose patience"; "I become easily impatient if I have to keep on with the same thing for a long time"). The internal consistency (alpha) reliability of this short scale was .59. The above results suggest, then, that adolescent boys with higher levels of testosterone tend to be habitually more impatient and irritable than boys with lower testosterone levels.

Testosterone and Antisocial Behavior

In the present study, there was a fairly weak correlation ($r = .17$) between testosterone levels and the self-report scale of Antisocial Behavior (covering such behaviors as petty theft, truancy, and destruction of other's property). This result is in some contrast to the findings of Kreuz and Rose (1972) and of Ehrenkrantz et al. (1974). On the basis of these studies, it might be hypothesized that there is an association in an adolescent population between level of testosterone and frequency of antisocial behavior, assuming that antisocial behavior is regarded as a form of aggression (cf., Kreuz and Rose, 1972). As evident from the above results, however, this hypothesis received only weak support in the present study.

   Furthermore, in our study of juvenile delinquents previously referred to (Mattsson et al., 1980), we were unable to replicate the finding of Kreuz and Rose (1972) implying an association between testosterone and history of violent/nonviolent crimes. In addition, there was only a small, nonsignificant difference in average testosterone level (although in the expected direction between the juvenile delinquents (587.0 ± 118.4) and the present group of more socialized boys of similar age (544.4 ± 141.3).

   All in all, the above results suggest that there is not a strong, direct

relationship between testosterone and antisocial behavior. If there is a systematic relationship between these two variables, it is likely to be of a more complex and, perhaps, indirect nature (below).

Mechanisms and Relative Importance of Testosterone

The main findings of the present study were the positive associations of testosterone level with the self-report scales of verbal and physical aggression, mainly reflecting responsiveness to provocation and threat, and lack of frustration tolerance. In addition, lower positive correlations were obtained with peer ratings of aggressive behavior (composite of three dimensions, table 13–1) and a self-report scale of antisocial behavior.

A possible interpretation of this pattern of findings will be briefly discussed in this concluding section. In doing so, I want to emphasize that the reasoning is based on the assumption that testosterone is primarily a causal variable in this context. Also, and maybe needless to say, even if the empirical data reported here are consistent with the arguments presented, the findings should be replicated on other samples before the suggested lines of explanation can be considered reasonably tenable. A more detailed analysis using path analytic techniques will be presented in another context.

Theoretical considerations and preliminary statistical analyses of the available data suggest that testosterone in adolescent boys may have two main effects on behavior: One is largely a direct influence on what may be called provoked aggression (as measured by the self-report scales of verbal and physical aggression) and the other a more indirect effect on unprovoked or destructive aggression (reflected in the peer rating composite) and generally antisocial behavior (measured by the self-report scale of antisocial behavior) via the mediating variable (relative) Lack of frustration tolerance.

Considering provoked aggression, it may be recalled that the verbal and physical aggression scales showed a correlation of .44 with testosterone levels. These scales correlated .54 with measures of the same scales taken 3 years earlier (in grade 6), which thus indicates considerable stability over time in this dimension. The grade-6 measure of the verbal and physical aggression scales correlated .23 with testosterone levels. The partial correlation of testosterone with the verbal and physical aggression scales taken in grade 9, with the grade 6 measure partialled out, was .39. There was thus a substantial association between the boys' testosterone levels and the measure of provoked aggression at age 16, even when their levels of aggression at 13 were controlled for. Since testosterone was positively

associated ($r = .28$) with Lack of frustration tolerance and the latter scale correlated .21 with the verbal and physical aggression scales (both these correlations are underestimates due to the low reliability of Lack of frustration tolerance scale, alpha $= .59$), it is reasonable to assume that at least a minor part of the testosterone-provoked aggression relationship is mediated via lowered frustration tolerance.

The preceding analysis implies that high levels of testosterone in puberty will increase a boy's readiness to respond aggressively or assertively to provocations and threats. To a minor degree, this may be an indirect effect of testosterone making the boy more irritable and impatient. It should be noted that the four factors that in earlier analyses (Olweus, 1980) have been found to be important determinants of aggressive behavior of the unprovoked destructive kind—the mother's basic emotional attitude, degree of permissiveness for aggressive behavior, (mother's and father's) use of power oriented disciplinary techniques, and the boy's temperament—were only weakly related to the boys' testosterone levels as well as to their levels of unprovoked aggression. These findings represent further support for the utility of (partly) differentiating these two forms of aggression. Their intercorrelation in the present sample was .45.

With regard to the dimension of unprovoked destructive aggression, it showed substantial stability over the 3 year period from grade 6 to grade 9, the correlation being .62. The grade 6 measure correlated only .11 with testosterone which thus shows that the boys' levels of testosterone were not "determined" by their earlier levels of unprovoked destructive aggression. The correlation of testosterone with the grade 9 levels of aggression was .21 and this relationship can be conceptualized as (partly) mediated by the variable Lack of frustration tolerance. As previously reported, testosterone correlated .28 with the latter scale which, in turn, correlated .41 with unprovoked destructive aggression. This pattern of relationships suggests that a high level of testosterone in puberty makes a boy more impatient and irritable which increases his readiness to engage in unprovoked destructive aggression. The latter part of this supposed chain of influences is in good agreement with what has been maintained for a long time in different variants of the frustration-aggression theory.

A similar line of argument can be followed in the case of antisocial behavior. The relationship of the antisocial scale with testosterone was positive but fairly weak, $r = .17$, (table 13–1). However, this scale showed a marked association ($r = .57$) with Lack of frustration tolerance and the latter scale correlated .28 with testosterone, as reported earlier. Thus, paralleling the previous line of reasoning, it can be assumed that an increase in testosterone level lowers an adolescent boy's tolerance of frustration which

leads to a heightened probability of engaging in generally antisocial behavior.

This argument appears intuitively reasonable and is consistent with the fact that boys who behave in an antisocial way seem to do so in part out of a desire for excitement, change and thrills (to avoid boredom). It should be noted that the above relations cannot be explained by reference to differences in age or pubertal stage (as measured by pubic hair development) since the latter variables correlated approximately zero with Lack of frustration tolerance and the scale of antisocial behavior.

With regard to the importance of testosterone in determining aggressive behavior in adolescent boys, the previous preliminary analyses suggest that it may be relatively influential with regard to aggressive behavior of the provoked kind (as measured by self-reports). The correlation of testosterone with this dimension was only slightly reduced when other causally prior variables were controlled for.

Considering the boys' readiness to engage in aggressive-destructive and antisocial behavior patterns, it is obvious that testosterone is only one out of many possible causal factors, and one with fairly weak effects. At the same time, it should be made clear that the reported correlations, based on fallible variables, underestimate the true relations. In addition, as previously underlined, the contribution of testosterone seems to be fairly independent of the effects of other causal variables. Accordingly, it can be concluded on the basis of this analysis that the role of testosterone in the development of aggressive and antisocial behavior patterns certainly merits further study.

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14 VIOLENT CRIME IN A BIRTH COHORT: COPENHAGEN 1953–1977

Erik Høgh and Preben Wolf

Introduction

The Aim of the Study

During the last 45 years or so, since Robert Merton (in 1939) first published his now classic article on "Social Structure and Anomie" (1957), undogmatic hypothesizing about crime and social status seems to have favored one or the other of two main, and partly competing, directions: One (that of Merton and others) has to do with frustrated ambitions and the effects of blocked opportunities. The other may be characterized and perhaps originate from Genevieve Knupfer's article from 1947: The "Portrait of the Underdog", and it tends to view individual criminality as one among several effects of a person's low social status origin.

In a previous paper (1978), based on the 1953 birth cohort of the Danish Project Metropolitan, the present authors and G. Strande-Sørensen have demonstrated a negative relationship between boys' social aspirations and "their later registrations by the police for at least one criminal offense." We

also found a negative relationship between occupational status of fathers and later criminality of sons.

   We further found that the social aspirations of 12 year old boys from the metropolitan area of Copenhagen were related to the future registered delinquency of the boys, even when social origin of the boys was held constant. More specifically it was found that upward aspirations seem to constitute a relative protection against delinquency among lower class boys, and that middle class boys seem to increase their risk of becoming registered delinquents if they tend to prefer future occupations at a lower level than that of their fathers.

   These findings make sense in the light of Svalastoga's contention (1959; 385–394) that upwardly mobile individuals tend to show more resemblance in several respects to members of their stratum of arrival than to those of their stratum of departure.

   The findings reported are also consistent with the well known tendency for members of low social strata to adopt a view of life that tends to further reduce their chances of moving upwards. Among other things they tend to "set for themselves very modest levels of aspiration" (Svalastoga op. cit.; 205–206).

   From both points of view social aspirations of boys appear to be important with regard to risk of later becoming delinquent. Since the aim of the present study will be to compare the two perspectives mentioned above with regard to the risk of becoming registered for violent crime (assaults etc.) among the members of the Danish metropolitan cohort from 1953, it has been necessary to relate new information about boys' actual social statuses and occupations in 1975 to the already available information about their aspirations from 1965, and it has further been attempted to take intelligence test scores of boys into account. The small number of boys registered for violent crime, however, severely restricts the possibilities of considering more than two or three variables at a time.

Factors in a longitudinal perspective

The Danish Project Metropolitan is based on a cohort comprising all boys born in 1953 within the cities (municipalities) of Copenhagen, Frederiksberg, and Gentofte together with the three adjacent counties of Copenhagen, Roskilde, and Frederiksborg. The Metropolitan area, thus defined, had a total population of 1,745,540 inhabitants in 1980. The population of this area is just about 34 percent of the total population of Denmark. This is slightly higher than the percentage in 1950 and slightly

lower than in 1975/76, when the registered delinquency of the boys was ascertained.

According to official statistics, 12,270 boys were born within the metropolitan area in 1953. In 1977 the researchers of Project Metropolitan succeeded in identifying 11,540 boys alive, or 94.05 percent of the original birth cohort, and 600 or 4.89 percent who had died before 1977. This adds up to 98.94 percent of the cohort being now identified within the project.

Up to now, two integrated and several separate files have been established. The cohort file contains an integration of the various kinds of information of which parts have been applied in the present study. This includes birth data from 1953, school data from 1965, data from the official demographic registers as of 1975, and data on registered crime and delinquency from 1975/76.

For the specific analyses presented here we have picked the following sets of data of which the first four have been found to be negatively correlated with the incidence of registered offenses or police contacts for the boys in the cohort:

1. Father's occupational status at the time when the boy was born, ascertained by birth certificate and birth register. 1953.
2. IQ test (Härnquist). Range of scores 0–120. 1965.
3. 51 different occupations put in rank order by respondent according to his own preferences with regard to future jobs. 1965.
4. Boys' own occupational statuses at age 22. Demographic register. 1975.
5. Whether or not registered by the police (Central Danish Police Register) for at least one punishable offense against the law (Penal Code and/or traffic laws, tax laws, by-laws etc.). 1975/76.
6. Whether or not registered for one or more violent offenses. 1975/76.

Thus the longitudinal aspects of the analyses become obvious. We consider registration of boys by the police as outcome data, which can be correlated with or predicted from information about boys' socioeconomic statuses (fathers' occupations) at birth, their tested IQ, and preferences for future occupations at age 12. Boys' occupational statuses at age 22 are likewise considered as outcome data to be correlated with the other data mentioned including the simultaneously ascertained delinquency registrations. Every piece of information mentioned has been secured prospectively at each stage in the lives of the boys, and not in retrospect. A total of 4,108 boys, or 35.6 percent of the cohort, were found in the Central Police Register

(Rigsregistraturen) for Denmark up to February 1976. Of these 120 or just over 1 percent were registered for reasons other than that of committing a legally punishable offense. This leaves us with a total of 3,988 registered boys or 34.5 percent of the cohort for further delinquency analysis. Due to some kind of error 7 (0.06 percent) boys were lost in the data process. Three of them were not registered by the police, two were registered for some kind of offense against property, probably theft, and two for traffic offenses only. We are thus left with a total number of 11,533 boys or 94 percent of the total cohort including 3,984 (34.5 percent) boys registered by the police. This number also includes 236 (2.04 percent of total cohort) boys, who were registered between the ages of 15 and 22 for at least one violent offense (excluding rape and robbery but including homicide and minor as well as major assault).

Social Status Variables

Father's Occupation

As previously mentioned, the occupations of the fathers of the boys in the cohort were ascertained from the birth certificates of the boys from 1953. The occupational status of fathers was ascertained more times during their later careers but the information utilized here is the earliest and presumably the most reliable. For 416 (3.6 percent) of the 11,533 boys included in this study, information about father's occupation was not ascertained at the time. With regard to registration by the police it may be said here that the proportion of registered boys among the 416 is only slightly higher (35.8 percent) than that of the total cohort. (34.5 percent). For 710 boys (6.2 percent) it was ascertained that father's occupation had not been given for various reasons, e.g. the father may not have had an occupation, he may have been unknown, or the mother did not want to tell who he was, etc. This group comprises the highest proportion of boys registered by the police at the age of 15 or more, namely 47.8 percent, closely followed by the sons of unskilled urban workers with 44.6 percent registered at least once between the ages of 15 and 22.

On the whole the picture resembles that of other studies showing more registered delinquency among boys of low status origin than among boys from the higher social strata. The distributions are shown in table 14–1. It can be seen from the table that registered violence follows the same tendency as other Penal Code offenses.

Table 14–1. Registration of boys by police for at least one punishable offense between the ages of 15 through 22 yrs by father's occupation at the birth of son in 1953. Project Metropolitan, Copenhagen, Denmark 1953–1976. Percentages

Son registered by the police up to 1975/76	Nonmanual selfemployed (owners)	Professional, academic and higher salaried functionaries	Non-academic lower salaried functionaries	Manual selfemployed (owners)	Skilled workers	Unskilled workers	Other and not ascertained	Total
Not registered	70.7	75.7	70.0	75.7	63.9	55.9	57.6	65.2
Reg. for nonpenal code offenses only	14.8	12.3	13.8	17.3	16.1	17.6	16.3	15.4
Reg. for penal code offenses excl. violence	13.2	11.3	13.7	6.3	17.6	23.0	23.4	17.4
Reg. for at least one violent offense	1.3	0.7	1.3	0.8	2.2	3.5	2.7	2.1
Total	100.0	100.0	99.0	100.1	100.0	100.0	100.0	100.1
N	937	2219	1546	255	2547	2795	11532	

Note: 1 person not classified in any of the occupational strata.

Occupational Preferences of Boys at the Age of 12

We have previously pointed in the direction of the Mertonian idea of frustrated ambitions and blocked opportunities (1957) as one of the major hypotheses that might be relevant for our purpose here. We have also mentioned that another direction (Knupfer 1947) seems to view criminality more or less as one of several effects of an inferior social status position from the outset.

The social aspirations of boys in this study have been operationalized as their future occupational preferences at age 12. Boys were asked to put 51 different jobs into rank order according to preference. This was done by those who were at school in the Copenhagen area. The study was administered by teachers in each of the school classes of boys typically 12 years old in 1965, i.e. the 5th form.

A total number of 7,917 boys born in 1953 were thus asked for their future occupational preferences. Of those, 2,643 (33 percent) were later registered as offenders by the police. Of the remaining 3,616 boys from the cohort, who happened not to be in school on the particular day when the questions were asked, or who were not in the 5th form, or for some other reason were not asked about their occupational preferences, 1,339 or 37 percent were later found in the police register.

Among those not in school there must have been some boys under special care in separate institutions for more or less deviant children (see e.g. Berg and Manniche 1967/68). Also, some boys may have been truant, as well as sick in bed, at home, or attending a form at a higher or lower level than the typical 5th form. Of the 7,917 boys who were actually asked about their preferences 412 (5.2 percent) did not state any particular preferences, 34 percent wanted an occupation requiring academic or similarly high education, and 28 percent wanted to become skilled workers. Less than 10 percent wanted to become shop assistants or clerical workers, while 15 percent preferred selfemployment of various kinds. Only 4 percent wanted to become unskilled workers; rural or urban.

Of those with the lowest aspirations (those wanting to be unskilled workers) 47 percent were later registered by the police as were 40 percent of those who wanted to become skilled workers. The distribution of registrations over the boys' preferences, when categorized as in table 14–1, can be seen in comparison with registrations in table 14–2.

The question of the intercorrelation between boys' aspirations and the occupations of their fathers is of course important and has been discussed in a previous paper (1978). It will also be considered in the tables discussed later in this chapter.

Table 14–2. Registration of boys by police for at least one punishable offenses between the ages of 15 through 22 yrs by occupational preferences at age 12 in 1965. Project Metropolitan, Copenhagen, Denmark 1953–1976. Percentages.

Son registered by the police up to 1975/76	Occupational preferences at age 12							
	Nonmanual selfemployed (owners)	Professional, academic and higher salaried functionaries	Non-academic lower salaried functionaries	Manual selfemployed (owners)	Skilled workers	Unskilled workers	Other and not ascertained	Total
Not registered	65.0	72.3	67.4	67.8	59.7	52.9	63.4	65.2
Reg. for nonpenal code offenses only	16.6	13.7	12.8	17.0	18.5	19.4	14.6	15.4
Reg. for penal code offenses excl. violence	17.0	13.0	18.7	13.1	19.5	23.6	19.3	17.4
Reg. for at least one violent offense	1.5	1.0	1.2	2.1	2.4	4.2	2.7	2.1
Total	100.1	100.0	100.1	100.0	100.1	100.1	100.0	100.1
N	825	3076	659	335	2249	361	4027	11532

Boy's Occupation at Age 22

There are in fact studies of the relationship between the occupational status of fathers and the registered delinquency of their sons which do not show the negative correlation between the two factors as clearly as it has been demonstrated in our present study (West and Farrington 1973, Wolf and Høgh 1975). But when it comes to people's own status, we cannot point to any study that does not find a clear negative correlation between occupational status and registered crime or delinquency. So it is not surprising that this is also found in this study. Although it must be kept in mind that variables like father's occupational status, boy's occupational preference, and boy's own later occupation are not independent of each other. Nor must we forget that in a longitudinal perspective the latter variable has a different standing from the other two factors. Data from 1975 about boys' occupations are output data like the data on crime and delinquency, and not necessarily prior to the latter in time.

So while father's occupational status and boy's occupational preferences may predict or even partly explain boy's later delinquency, we shall not here be able to say whether the boy's registered delinquency can be explained by his low occupational status in 1975 or whether it is rather the other way round. Another difficulty with boys' occupational statuses at age 22 is the fact that many of the young men have not left the educational system, and many of those who have cannot be expected to have arrived at a social level where they may be considered more or less stabilized. According to Svalastoga (1959; 308–309) the sharpest status changes in the life of an adult Danish male seem to happen between the ages of 20 and 30 years.

The remarks above are meant to serve as a warning: Even if we say something about frustrated occupational aspirations in the form of discrepancies between boys' occupational preferences at age 12 and their later actual occupations at age 22, and also whether these discrepancies are more or less correlated with registered crime and delinquency, we cannot, at the present level of analysis, use any such apparent frustration of aspirations for explanation or prediction of registered delinquency. Table 14–3 approximates the classification of the occupational statuses stated in tables 14–1 and 14–2. It has been necessary to merge some categories and separate others. Thus the first two columns of tables 14–1 and 14–2 can be found in table 14–3. Higher old and new middle class. Columns 3 and 4 are merged together as Lower old and new middle class. The category: Other is separately stated because it consists of a large body of students still within the educational system at the age of 22. This category should be expected to

show greater similarity to the two middle class categories than to the working class columns. It can be seen from table 14–3 that this is only partly true.

IQ and Delinquency

A large number of studies have demonstrated a negative relationship between IQ and crime or delinquency, and it has been demonstrated in studies applying many different kinds of intelligence tests. A comparative survey of such studies has been provided by Clara Chassell Cooper (1960) covering a period of more than 100 years. A recent study by Moffitt et al. (1981) has discussed a number of newer pieces of research, and tested some new hypotheses. It is clear from their article that the negative correlation mentioned is particularly strong where verbal intelligence is involved. This is also the impression we get from the data in Project Metropolitan, Copenhagen.

   The IQ test used in our study was created by Professor Härnquist of the University of Gothenburg, Sweden, and translated into Danish for Project Metropolitan by Weltzer. It consists of a verbal, a spatial, and an inductive test; all three with separate scores from 0–40 and combined into a total score ranging from 0–120. It is the total score to which we shall refer in this paper. The relationship between various measures of socioeconomic status, IQ, and delinquency has been a matter for much discussion. We tend to agree with Moffitt et al. (op. cit.) that IQ bears a relationship to crime and delinquency which is somewhat independent of social status. This question will be treated a bit further below. At this point we just wish to show the raw distributions (percentages) of registered crime and delinquency by six IQ score classes (based on Härnquist: Total score) over all Metroboys tested in 1965 (12 years old). This has been done in table 14–4.

Violent and Other Offenses

Registered violent offenses have been defined here as offenses such as homicide and minor and major assaults described in chapter 25 of the Danish Penal Code. Registered violent offenses do not include such crimes as rape (in chapter 24 of the code) and robbery (in chapter 26). The Central Police Register will either apply the word violence or quote one or more of the appropriate section numbers from the Penal Code. The definition registered is the one applied at the time of registration, i.e. at the earliest stage in the legal process, when the suspect is confronted with a formal accusation or

Table 14–3. Registration of boys by police for at least one punishable offense between the ages 15 through 22 yrs by boy's occupation at age 22 in 1975. Project Metropolitan, Copenhagen, Denmark 1953–1976. Percentages.

Boys registered by the police up to 1975/76.	Occupational status of boy in 1975						
	Higher old and new middle class	Lower old and new middle class	Skilled workers	Unskilled workers	Other (mainly students)	Not ascertained	Total
Not registered	72.9	75.3	63.7	43.5	76.4	63.8	65.2
Reg. for nonpenal code offenses only	5.1	13.8	19.6	17.2	11.5	15.2	15.4
Reg. for penal code offenses excl. violence	18.6	10.3	14.8	34.6	11.5	18.5	17.4
Reg. for at least one violent offense	3.4	0.6	1.9	4.8	0.6	2.5	2.1
Total	100.0	100.0	100.0	100.1	100.0	100.0	100.1
N	59	1473	2512	1721	2678	3089	11532

Table 14-4. Registration of boys by police for at least one punishable offense between the ages of 15 through 22 yrs by boy's IQ at age 12 in 1965. Project Metropolitan, Copenhagen, Denmark 1953–1976. Percentages.

Boys registered by the police up to 1975/76	Total IQ in 1965						
	IQ 1-44	*IQ 45-55*	*IQ 56-68*	*IQ 69-80*	*IQ 81-90*	*IQ 91-120*	*Total*
Not registered	57.3	57.8	61.8	69.3	75.0	79.1	66.4
Reg. for nonpenal code offenses only	15.7	18.8	17.8	15.3	12.2	12.6	15.7
Reg. for penal code offenses excl. violence	23.3	21.7	18.4	13.9	12.0	8.1	16.3
Reg. for at least one violent offense	3.7	1.7	1.9	1.5	0.9	0.3	1.7
Total	100.0	100.0	99.9	100.0	100.1	100.1	100.1
N	833	1136	1956	1930	1234	779	7868

charge. This early formal definition may change during the process at the time of indictment or some other time before final decision or conviction in the case.

It is characteristic that the first police registration in the career of a young delinquent from this cohort is rarely concerning a violent offense, and that persons registered for violence during the period between 1968 and 1975 will usually have been registered before for one or more nonviolent offenses. The proportion of violent offenses seems to increase with the number of all offenses registered in a young man's career. The various kinds of crime and delinquency are not independent of each other. On the contrary, if a young man has already been registered for property offenses, drug offenses, or sexual offenses he will have an increased risk of being also registered for one or more violent offenses and vice versa. It is furthermore characteristic of violent offenders that they seem to have not only lower IQs than non-offenders but also lower IQs than those of other offenders, with a possible exception for sexual offenders. From tables 14–1, 14–2, 14–3, and 14–4 it is obvious that registered crime and delinquency in general, and violence in particular, are predominantly trait-characteristic of persons of low social status origin, low aspirational level, and low IQ. It is true that there is also a correlation between high crime and low status of delinquent's own occupation. But we choose to consider not only the boy's own low status but also the fact that he has been registered for one or more violent offenses as effects of his original, underprivileged situation. We consider the occupational status of boys at age 22 to see whether or not upward aspirations at age 12 will outweigh the effect of actual low status at age 22; whether actual upward mobility of boys relative to their fathers may possibly outweigh the apparent detrimental effects of having low or no aspirations at age 12.

In spite of the small number of registrations for violence found in the present material, we are mainly interested in this type of offense. One of the reasons for this is the indications (in tables 14–1 through 4) that violent offenses are more closely and more consistently correlated with low aspirations and low IQ at age 12 than with occupational status of self and/or of father, and more so than are registrations for other kinds of offenses.

A simple rank correlation (Spearman's r) based on the figures in the four tables just mentioned shows that registrations for criminal violence have high negative correlations with social aspirations of boys at age 12 ($r = -0.9428$) and with intelligence of boys at the same age ($r = -0.9446$). Both correlations are significant (Spearman's K) at the four percent level, while the corresponding correlations with socioeconomic status of father (table 14–1) and of boy himself (table 14–2) are lower and not significant. Rank correlations are also low and insignificant between nonviolent Penal Code

offenses on one hand and status of fathers, of boys themselves at age 22, or with aspirational level of boys at age 12 on the other. The negative correlation is perfect with regard to intelligence (table 14–3).

Is IQ Related to Registration for Violence Independently of Social Status?

Moffitt et al. (op. cit.) report on the basis of their cohort studies (from Denmark) that IQ is related to level of delinquent involvement, defined as no registered offense, one offense, or more than one offense registered in the Danish National Police Register. This concerns one of their two studies (op. cit.; 153). The other study defines delinquent involvement in terms of convictions instead of in terms of registrations (op. cit.; 154).

Here we are concerned with registered violent offenses only, and since the total number of such offenders is fairly small in our study (see table 14–3) we shall not try to analyze variation in delinquency with IQ and socioeconomic status in much detail, nor with much sophistication. We choose to classify the Metroboys into three IQ categories: Low (scores 1–44), Middle (scores 45–80), and High (scores 81–120). Likewise into three socioeconomic classes: Old and new middle class; Skilled workers; Unskilled workers. This leaves us with a total number of 7,181 Metroboys of whom 112 (1.56 percent) have been registered for one or more violent offenses between the ages of 15 through 22 years. (See table 14–5.) Calculations based on table 14–5 indicate that registered criminal violence at age 15–22 is clearly related to social status of origin and to IQ at age 12. We also know from other studies and from hitherto unpublished pieces of research from Project Metropolitan that IQ is significantly related to parental social status. So like Moffitt et al. (op. cit.) we would like to see what happens to the relationship between IQ and delinquency when we keep parental socioeconomic status constant.

Our results with registered violence are more ambiguous than those of Moffitt et al. concerning delinquency involvement. Significant relationships with regard to violence and intelligence differ among the various social strata, and the influence of social status of father is somewhat different from one intelligence level to another.

When we dichotomize the status categories, and collapse all middle class and skilled workers into one, we get significantly different distributions of violent crime over the three IQ categories, i.e. significantly more violent crime registered among those with IQ scores 1–44 than among those with IQ scores 45–80 as well as among those with IQ scores 81–120. Further, we get

Table 14–5. Registration of boys by police for at least one violent offense between the ages of 15 through 22 yrs by father's occupational status at birth of son in 1953 and son's IQ at age 12. Project Metropolitan, Copenhagen, Denmark 1953–1967. Percentages in ( ).

Occupational status of fathers in 1953 and IQ score classes of boys in 1965			Sons registered by the police up to 1975/76					
			Not reg. for violent offense (percent)		Reg. for one or more violent offenses (percent)		N	(percent)
Old and new	IQ	1–44	211	(98.60)	3	(1.40)	214	(2.98)
middle class	IQ	45–80	2032	(98.98)	21	(1.02)	2053	(28.59)
	IQ	81–120	1183	(99.67)	4	(0.33)	1187	(16.53)
Skilled workers	IQ	1–44	211	(96.35)	8	(3.65)	219	(3.05)
	IQ	45–80	1202	(98.29)	21	(1.71)	1223	(17.03)
	IQ	81–120	403	(99.76)	1	(0.24)	404	(5.63)
Unskilled	IQ	1–45	289	(95.03)	15	(4.93)	304	(4.23)
workers	IQ	45–80	1268	(97.54)	32	(2.46)	1300	(18.10)
	IQ	81–120	270	(97.48)	7	(2.52)	277	(3.86)
All strata	IQ	1–44	737	(96.48)	26	(3.52)	737	(10.26)
	IQ	45–80	4506	(98.39)	74	(1.61)	4576	(63.72)
	IQ	81–120	1856	(99.36)	12	(0.64)	1868	(26.01)
Total			7069	(98.44)	112	(1.56)	7181	(100.00) (99.99)

significantly less violence among those with high IQ than among those in the medium category. For the group of unskilled workers this is not so. In this low social stratum those with IQ scores 1–44 have significantly higher frequency of violence than that found for the middle score category, but not significantly higher than that of the top IQ category (81–120). If we then separate the two middle and higher strata from each other, the picture again becomes less clear. If we keep each of the IQ score classes constant and vary parental social class we get only partly parallel results. However, even when the relations are significant, the correlations are weak.

   In summary high IQ may tend to protect middle class and skilled workers' sons against the risk of becoming violent delinquents. On the other hand, sons of unskilled workers appear to run an increased risk of violent delinquency if they have a low IQ. These different tendencies among the social strata may seem to favour the perspective of low status origin in the aetiology of crime. High IQ—if protective at all—seems to work better for

young who are fairly well protected from the risk of becoming violent by the fact that they belong to the high or low middle classes. Low intelligence seems to increase the same risk for young men who are already at high risk because of their low parental social status. In addition, low socioeconomic status seems to be a more serious threat to boys in the two extreme IQ score classes applied here, while those with a medium IQ seem to be just as protected by a middle class origin as they are vulnerable when they originate from a parental category of unskilled workers.

There is still the possibility that the relationship of violent crime to IQ is relatively independent of father's occupational status, but it is doubtful how far it may be useful in its own right for prediction—let alone explanation—of criminal violence among young Danish males.

Registered Violent Crime as Related to Social Origin, Social Mobility, and Occupational Aspirations

If we now look more closely at registered violence in relation to social origin 1953, actual social mobility up to 1975, and occupational aspirations (1965) we seem to find results parallel to those referred to in the introduction. Because of the small number of violent persons registered, we have dichotomized father's social status; middle class with skilled workers together in the higher category and unskilled workers in the lower category. The percentage of boys registered for violence is 1.40 in the first category as compared to 3.50 in the second. Boys' occupational levels of aspiration have likewise been dichotomized into the category of boys who want the same or higher social status than that of their middle class or skilled fathers, and boys who have no or lower aspirations. For sons of unskilled workers the corresponding dichotomization has been made, but it had to be defined in a slightly different manner, since a boy from the bottom layer can hardly have lower aspirations. So for this parental stratum we have one category of boys who have upward aspirations, and another comprising those who have no, or low, upward aspirations.

Keeping father's occupational status constant we find within the category of middle class and skilled workers 1.08 percent boys registered for violence among those with same or higher aspirations, and 1.77 percent among those with downward aspirations or no aspirations at all. In the category with unskilled fathers we find 2.72 percent registered for violence among those aspiring upwards, and 4.57 percent among those with no, or no upward, aspirations. These differences in frequency of registration for violence are significant within each of the two parental status categories used here.

The increased frequency of registration for violence shown for unskilled workers' sons having low or no aspirations may be said to represent one of several effects of a low status origin. It has already been mentioned (table 14–3) that we have included boys' own occupations at age 22. These occupations have been dichotomized in accordance with the principles used for fathers' occupations and boys' preferences. The only difference is that boys still in the educational system at age 22 have been classified into the category containing middle class and skilled workers. These young students may not have arrived yet, but they are definitely under way to one of the strata above the unskilled level.

Table 14–6 shows percentages of boys registered for violence distributed by parental social status, occupational aspirations of boys at age 12, and boys' social mobility based on their own social statuses at age 22. It can be seen from this table that actual social mobility of boys is also significantly related to frequency of those registered for violence.

Among the actually upwardly mobile or stable boys from a middle class or skilled worker origin we find 0.84 percent registered for violence against 1.87 percent among the actually downward mobile. Among the upwardly mobile boys originating from unskilled workers, the percentage of boys registered for violence is 1.64, and for those stable or not ascertained it is as high as 5.39.

Before jumping to conclusions about the apparent greater effect on registered violence of actual mobility than the effect of high or low aspirations, we must remember our first warning: We do not know what comes first in time, the registration for violence, or the actual arrival at some social level. In contrast to this, there will be no doubt about the sequence of aspirations on the one hand, and of both registrations and occupational attainments on the other.

Both registrations for violence and a boy's own low occupational status may be examples of effects of an original low status position. This perspective is a kind of hypothesis of the "slippery slope": Being born into a low status family a boy has already taken his first step out on an inclined plane, which seems to be even steeper and more slippery when his IQ and/or his aspirations are low. With a high IQ and/or realistically high aspirations he may avoid delinquency. He may in fact be protected against various low status risks, including the risk of becoming a violent criminal. However, intelligence and/or aspirations are not enough. There must also be room available at the top, or at one of the intermediate levels. If that is not the case, we have a new risk situation, this time caused by blocked opportunities or by otherwise frustrated aspirations (Merton 1957).

Table 14–6. Registration of boys by police for at least one violent offense between the ages of 15 through 22 yrs by father's occupational status at birth of son, son's social aspiration at age 12, and son's actual social mobility up to age 22. Project Metropolitan, Copenhagen, Denmark 1953–1976. Percentages.

Social status of father 1953.	Social aspiration of boy 1965	Social mobility of boy 1975	Percent registered for violence	N
Father member of middle class or skilled worker	High aspirations	Stable or upward mobile	0.61	2107
		Downward mobile	1.57	1963
			1.08	4070
	No or low aspirations	Stable or upward mobile	1.19	1339
		Downward mobile	2.14	2095
			1.77	3434
Total			1.40	7504
Father unskilled worker	High aspirations	Upward mobile	1.45	892
		No upward mobility	4.29	722
			2.72	1614
	No or low aspirations	Upward mobile	1.95	512
		No upward mobility	6.57	669
			4.57	1181
Total			3.50	2795
All strata			1.97	10299

Note: All the percentages in this table represent significant relations (X^2-test) at 5 percent or lower levels except for those of a parental middle class with no or low aspirations, for whom the significance of mobility relations to registered violence lies at 7 percent level.

If these suggestions are valid within the narrow scope of this study we should expect to find an increased frequency of registrations for violence among those with low aspirations, when we keep parental social status constant. Under the same condition we should also find an increased risk for those boys who have upward aspirations, but whose aspirations are frustrated because they have not been able to find sufficiently good actual jobs or educational opportunities.

The distributions in table 14–6 seem to indicate that both perspectives mentioned may be valid. It may be that the effect of low status origin is the stronger of the two. See for example the higher percentage of boys registered for violence in the bottom row of table 14–6. Low parental status plus no or low aspirations plus no upward mobility can be equated with the highest violent delinquency rate. The top row shows quite another picture: High parental status plus high aspirations plus stability or upward mobility can be equated with the lowest violent delinquency rate.

The modified tendencies apparent in the six intermediate columns point in the directions expected both from the perspective of an inferior social status origin, and from the perspective of frustrated aspirations. These results may not be sufficient to confirm one or both perspectives or hypotheses, but they certainly do not speak against any of them. As far as the hypothesis of blocked opportunities or frustrated aspirations is concerned, the missing information about the time sequence of the two output variables (social mobility and registered violence) makes it absolutely impossible to make any confirmatory statement.

However, if for example the high aspiring, downwardly mobile youngsters had shown no significant relative increase in frequency of registered violence, it would have been a serious blow against the Mertonian hypothesis. So our present contention is that a comparatively high frequency of young men registered by the police for violent offenses is a characteristic effect of their low status positions in society from the day they were born. For those who are not born into inferior positions, or who have perhaps managed or decided to start climbing up the slippery slope, it may be important that their opportunities of making an arrival are not blocked, and that their aspirations are not frustrated.

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15 A LONGITUDINAL STUDY OF AGGRESSION AND ANTISOCIAL BEHAVIOR

Joan McCord

Introduction

An assumption that aggression and antisocial behavior represent the same dimension of personality appears frequently in the literature. For example, Dollard et al., (1939) used crime rates to support their thesis that frustration leads to aggression. Bandura and Walters (1959) wrote of adolescent aggression in describing their study of delinquents. Lefkowitz et al., (1977) considered arrests as a criterion to validate their measure of aggression. Perhaps the absence of evidence about the relationship between aggression and criminality has gone unnoticed because antisocial behavior is identified as being behavior injurious to society and aggression is defined as behavior intended to injure. Yet not all behavior intended to injure is criminal, and not all criminal behavior appears to be aggressive. The present research is aimed

at disentangling antecedents of aggressiveness and antecedents of antisocial behavior.

Method

Selected for study when they were between the ages of five and nine, the subjects have been traced to their late forties. These men had been part of the Cambridge-Somerville Youth Study, a project designed to prevent delinquency. All lived in congested neighborhoods. Some of the boys were chosen because they were troublemakers; others were chosen because they were not.[1]

Information about the boys begins with reports from their elementary school teachers, written in 1936 and 1937. These teachers' reports were used by the selection committee of the Youth Study. In them, teachers were asked to note whether a boy tended to tease or bully or fight with his classmates. Those boys whose teachers described them as teases, bullies, or fighters are considered, for purposes of the present research, to have been aggressive as young children.

Between 1939 and 1945, counselors visited 232 families an average of twice a month. Whether they encountered a mother in drunken stupor or a child quietly doing his homework, the counselors tried to describe in detail what they had seen, heard, and done. These descriptions provide running records of the boys and their families. The records, coded in 1957,[2] yield evidence about adolescent behavior and about the parents of the subjects in the present sutdy. On the basis of evidence in the running records, all but five were rated for aggressiveness.

Among the 227 men in the study, 46 (20%) were rated as highly aggressive adolescents. Two judges independently rating randomly selected cases had agreed in their judgments of 92% of the aggression ratings. An additional 67 (30%) had been described as aggressive during childhood. And 114 (50%) had been considered aggressive neither as children nor as adolescents. The parents were classified on scales describing affection, aggressiveness, discipline, conflict, and role model.

Counselors had described many interactions between a boy and his parents. Parental affection was coded as present if the record showed that a parent was concerned for the welfare of the child and that criticism was absent in most of their interactions. Two raters reading the same records agreed on 84% of the mother ratings and on 80% of the father ratings.

A parent was rated as aggressive if, when frustrated or annoyed, the parent typically yelled, threw things, or attempted to injure someone. For these

ratings, independent coders agreed on 92% of the mothers and on 84% of the fathers. A boy was rated as having or not having at least one unrestrained, aggressive parent.

Several dimensions qualified the types of discipline to which the boy was exposed. A parent was coded as punitive if corporal punishments formed the basis of the parent's attempts to control the boy. For the mother, an interrater reliability check produced 96% agreement; for the father, 76% agreement. A parent was coded as consistent and nonpunitive if the standards of that parent were reasonably constant and predictable and if that parent enforced them without recourse to physical punishments. Two independent readings were in agreement for 84% of the ratings of mothers, but for only 60% of fathers' ratings on this categorization. Supervision of the boy was rated on the basis of whether or not the child's activities outside of school were governed by an adult. Two raters agreed on 88% of the cases regarding this classification. A measure of the level of parental expectations for the boy's behavior was gleaned from the records by looking to see whether the boy was expected to care for younger siblings, assist in preparations for meals, contribute to the financial support of the family, or do "extremely well" in school. Evidence for any of the expectations was sufficient to classify a boy as exposed to high expectations. Independent codings were in agreement on 76% of the classifications.

To rate parental conflict, raters had been instructed to look for disagreements between the parents about the child, values, money, alcohol, or religion. For the present research, cases were divided into those whose parents evidenced considerable conflict and those in alternative categories (no indication, apparently no conflict, or some conflict). Independent readers agreed on 80% of the cases used to estimate reliability of this variable.

A father was considered to be a deviant role model if he was either alcoholic or criminal. Coders rated a father as alcoholic if the case record indicated that he had lost jobs because of repeated drinking, if marital problems were attributed primarily to his excessive drinking, if welfare agencies had repeatedly pointed to the father's drinking as ground for family problems, or if the father had received treatment specifically for alcoholism. Independent coders agreed in 96% of the ratings on this variable. In 1948, after termination of the counseling program, criminal records for the family members of subjects were collected; these records were locked in a file separate from the case histories. An assistant unfamiliar with the subjects' case histories coded the criminal records. If a father had been convicted at least three times for public drunkenness, he was classified as being alcoholic. If he had been convicted for theft, burglary, assault, rape, attempted murder, or murder, he was considered as criminal.

For purposes of considering effects of maternal role behavior, the mother was classified as leader, dictator, martyr, passive, or neglecting. Two raters agreed on 76% of the ratings for this variable.

Between 1976 and 1978, the men were retraced. Simultaneously, records showing criminal histories were searched to discover which of the men had been convicted.[3] Considering as criminal only those convicted for crimes indexed by the FBI,[4] 77 men had been criminals.

As would be expected, many of the variables describing the families were interrelated. Aggressive parents tended to be in conflict. Parents who could not get along with one another also tended to provide poor supervision. Fathers who were alcoholics or criminals tended also to be in conflict with their wives. Affectionate mothers tended to provide consistent, nonpunitive discipline, to be family leaders, to supervise their sons, and to be married to men who were also affectionate.

The ten variables used to capture a description of the family milieu in which the boys had been reared were combined to form five scales. An affection scale was based on whether neither, one, or both parents had been affectionate. The low point of this three valued scale represented parental rejection; 105 of the men appeared at this end, having been reared by neglecting or rejecting parents. Eighty-three men had been reared by one affectionate parent, and 34 had two affectionate parents.

A scale based on discipline, expectations, and supervision was used to measure the degree of control exerted over the boy's activities. On this scale, the low point represented a background in which the mother's discipline was either inconsistent or physically punitive, behavior expectations were not high, and supervision was not regularly provided. The records showed that 75 of the men had experienced little control as measured by this scale. If the mother had been consistent and nonpunitive in discipline, if behavior expectations had been high, or if the boy had been supervised, the degree of control was considered at least moderate. To be counted as having experienced a high degree of control, a boy must have received consistent nonpunitive discipline from his mother and either been expected to perform relatively responsible tasks or been regularly supervised in his activities. Fifty four men qualified as having been exposed to a high degree of control; 98 men had been reared with moderate control.

To measure family aggressiveness, the father's punitiveness, parental conflict, and the parents' aggressive behavior were taken into account. At the low end of this scale, 110 men had apparently been exposed to none of these three forms of aggressiveness. To qualify as having been exposed to a high degree of aggression, the aggression must have been partly directed against the boy, as evidenced through consistently punitive paternal discipline, and

also to have been exposed to parental conflict or an aggressive parental model. Only 19 men met the criteria for having been exposed to a high degree of aggression, though 98 had been exposed to a moderate degree.

A scale reflecting the father as a model was composed of the variables describing his affection toward the boy and whether or not he had been a deviant (as shown in alcoholism or criminal records). Forty men had affectionate, nondeviant fathers; 110 had fathers who were either deviant or not affectionate; and 77 had fathers who were both deviant and not affectionate.

A scale reflecting the mother as a model was based on her affection for her son and whether or not she was a leader in family interactions. Eighty-two men had affectionate mothers who had accepted leadership roles in the family; 81 had mothers who had either not been leaders or not been affectionate; and 64 had neglecting or rejecting mothers who failed to be leaders in the family.

Stepwise discriminant analyses (SAS, 1981) were used with both the categorical descriptive variables and the ordered scales. No variable was selected for entry into the multiple regression equation unless its partial F statistic was significant at the .05 level. Data analyses were directed toward discovering types of socialization that promote and that reduce aggressiveness and antisocial behavior.

Results

The dimension of control distinguished the 113 aggressive youths from their 114 less aggressive peers. Whereas 61% of the boys exposed to little control and 47% of those exposed to moderate control were aggressive, only 39% of those who experienced a high degree of control had been aggressive youths. The control scale, as used in the discriminant function analysis, accounted for 2.9% of the variance in aggression, $p = .0097$. The analysis using categorical variables identified two as contributing significantly to aggressiveness: a father's use of corporal punishment and absence of supervision. Together, these variables accounted for 5.2% of the variance in aggressiveness, $p = .0026$.

Among the 113 aggressive youths, 67 who had been bullies or fighters as young children were no longer highly aggressive as teenagers. Only the scale describing the mother as a model significantly discriminated between the 67 who were no longer aggressive as teenagers and the 46 who were also aggressive as adolescents. This scale accounted for 10.1% of the variance in reduction of aggressiveness, $p = .0006$. Among the aggressive youths, 83%

of those whose mothers were both affectionate and family leaders had learned to control their aggression. On the other hand, only 43% of those whose mothers were neither affectionate nor leaders (and 51% of those who were either affectionate or leaders) had learned to control their aggression.

Approximately a third of the men had been convicted for crimes indexed by the FBI. In addition to the measure of whether or not he had been an aggressive youth, three scales significantly distinguished between these 77 men and the remaining 150 in the cohort. In their order of contribution to explained variance, these scales were those that measured family aggressiveness, degree of control, and affection. Together, the scales accounted for 14.1% of the variance, $p = .0001$. With the addition of the measure describing youthful aggression, the discriminant function accounted for 15.6% of the variance in antisocial behavior. Four of the categorical variables contributed significantly to antisocial behavior: parental aggression, supervision, maternal affection, and parental conflict.

Among the 114 youths who were not highly aggressive, 29 (25%) acquired criminal records for index crimes. Parental aggression, parental conflict, and maternal rejection together accounted for 28.7% of the variance in criminality for this group, $p = .0001$. Among the 113 aggressive youths, 48 (42%) were convicted for index crimes. Only paternal affection was significantly related to crime among these men. Presence or absence of affection from the father accounted for 4.1% of the variance, $p = .0311$.

Summary

This study explores the relationship between aggressiveness and antisocial behavior. It employs measures of aggression and of socialization based on direct observation during childhood and relates these to antisocial behavior in subsequent decades.

Family backgrounds providing little control, especially if coupled with discipline through corporal punishment, seemed particularly conducive to aggression. Maternal affection and leadership appeared to mitigate these effects. The findings on aggression closely parallel those reported by Olweus (1980) for a study of adolescent aggression among Scandinavian boys.

Evidence from this study suggests that whether youngsters become antisocial depends on how they are treated in their families more than on whether they are aggressive. Childhood aggression was a precursor of antisocial behavior. Parental aggression, control, and affection, however, appeared to have even greater impact upon subsequent antisocial behavior.

Notes

1. The project included a matched control group. Since records on family life were limited to intake interviews for most of the control group, only former members of the treatment group have been used in the present analysis. To justify treatment of family backgrounds as independent units for analyses, only one boy per family was included. See Powers and Witmer (1951) for details regarding selection of cases and a description of the treatment program.

2. See McCord and McCord (1960) for a description of the coding.

3. Ten states cooperated in this part of the study. The author wishes to express appreciation for help from the Massachusetts Department of Probation, the Division of Criminal Justice Services of the State of New York, the Maine Bureau of Identification, and the states of California, Florida, Michigan, New Jersey, Pennsylvania, Virginia, and Washington.

4. Motor Vehicle theft, larceny, burglary, assault, robbery, forcible rape, murder, and nonnegligent manslaughter.

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16 AGGRESSION AND CRIMINALITY IN A LONGITUDINAL PERSPECTIVE

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A Longitudinal Research Program

Since 1965 a longitudinal research program with the title "Individual development and environment" has been in progress at the Department of Psychology, the University of Stockholm. The purpose of the project is to study individual development from early age to adulthood, with particular emphasis on the development of social adjustment. Main subprojects within the program are directed to the study of the genesis of alcoholism, criminality and mental illness. In view of the important role that the individual's educational-vocational career process and his/her social network play in the development, they have been afforded special attention. (For information about the program, its main aims, strategies and data collections, the reader is referred to Magnusson, in press; Magnusson and Dunér, 1981; Magnusson, Dunér and Zetterblom, 1975).

The frame of reference for the study of social development is the view that individuals develop a in a continuous, bidirectional interaction with the environment, as it is manifested in physical, social and cultural characteristics. Within the limits of his/her somatic and psychological predispositions each individual develops—in this interaction process with the environment—

a way of understanding, interpreting and dealing with the external world that is partly unique for him/her (Magnusson, 1978; 1981). A general aim of the project is to investigate how individual (psychological and somatic) and environmental (physical, social and cultural) factors independently and jointly determine individual development.

The process oriented character of the project implies that the problems can be studied most efficiently by following a number of individuals over time (Wohlwill, 1973). The project is longitudinal in nature and has followed a representative sample of boys and girls since they were 10 years of age. They are now 26 years of age.

The general view of human development as a process of continuous interaction between an individual and his/her environment implies that it cannot be studied and understood effectively without considering person and environmental factors simultaneously for the same individuals. This is especially true in the study of manifest, social behavior. On the person side, psychological factors (mediating variables) such as intelligence, creativity, interests, attitudes, norms and values, manifest behavior such as aggression, hyperactivity and drug consumption and relations to parents, peers and adults in general and somatic factors (brain activity measured by EEG, hormonal activity and physical capacity) are covered. On the environmental side, most interest has been devoted to mapping the family conditions, parents' education and income, family relations, family norms, family activities etc.

Data for most of the factors investigated have been collected using extensive methods, i.e., methods that allow administration to groups of individuals. This has been the case for intelligence tests, inventories etc. Intensive studies have been performed on samples of individuals, when the information needed presupposes methods that must be used for one individual at a time (interviews, observations, physiological measures such as EEG, etc).

The view adopted here implies that maladjusted behavior in general is not determined by person factors or environmental factors, neither in a developmental nor in a contemporaneous perspective. It is the joint effect of person and environmental factors. The general model can be illustrated as in figure 16–1 (cf. Magnusson, in press).

On the person side, the kind and degree of a certain maladaptive behavior at a certain occasion is determined by the relation between the individual's vulnerability in psychological and physiological respects to environmental influence, and the kind and strength of environmental provocation. Psychological and physiological vulnerability can be learned and/or inherited. It can be either restricted to certain specific types of behaviors (skin reactions, heart
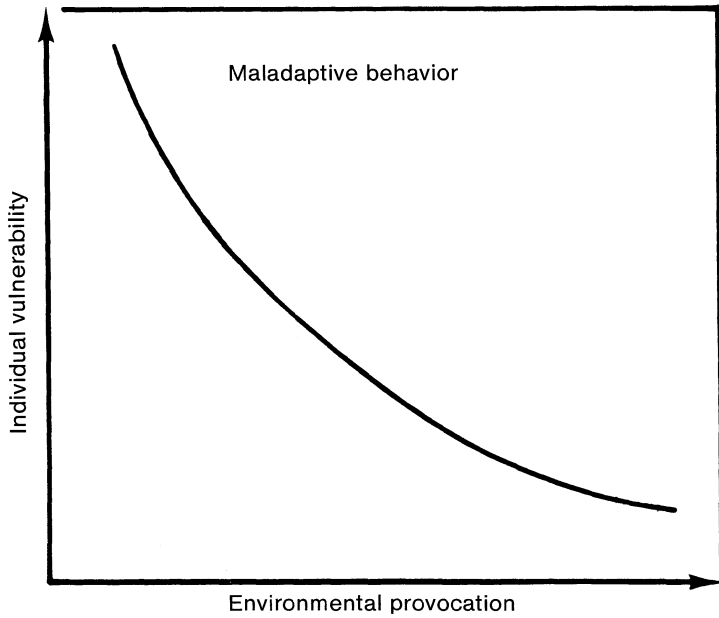
Figure 16–1. If and to what extent maladaptive behavior occurs is the joint effect of the vulnerability of the individual and the provocative strength of the situation.

reactions, for example) or be so general as to include the total organism. On the environmental side, the effective factors can be physical, social, cultural and psychological, operating independently or in conjunction with each other. They can be restricted to specific situational conditions (phobic situations, for example) or be so general as to indicate most types of environment. The relation between personal vulnerability and environmental influence leading to maladaptive behavior, as illustrated in figure 16–1, varies between individuals for specific types of reactions and behaviors, and for types of environmental conditions. The general model reflects an interactional view on human development and on contemporaneous behavior. According to such a view, both the development of physiological and psychological predispositions for a certain kind of behavior (criminal behavior, for example) and the occurrence of that behavior at a certain occasion are determined in a process of continuous, bidirectional interaction between person and situation factors, in which the person is the active intentional agent (Magnusson and Endler, 1977).

A Person vs a Variable Approach in Research on Development

The view of development as a continuous, bidirectional man-environment interaction process has important theoretical, research strategical and methodological consequences. One such consequence is that we are more interested in individuals than in variables. In the interaction process in which an individual is involved during development, the total pattern of effective factors on the person side changes continuously. The psychological meaning of mediating variables, their relative role, and their behavioral manifestations change (for discussions about these problems and implications for theorizing and empirical research, see e.g., Emmerich, 1964, 1968; Kagan, 1971; McGall, 1977; Moss and Susman, 1980). In this perspective, the study of the stability of single variables has its most important value as a prerequisite for the study of individuals as totalities. The fact that so many resources have been devoted to the study of the stability of single variables in empirical research may be explained by the interest in the inheritance vs environment problem for individual development.

A person versus a variable approach to development research is not only a theoretical problem. It has serious consequences for methodology and research strategy in longitudinal research. With the emphasis on individuals rather than on variables, the main interest in the project is on "psychological continuity" in development, rather than on the psychometric stability of particular individual variables across ages. Thus our aim has not, in the first place, been to measure the same variables at different ages, but to try to cover the different forms that aspects of adjustment and maladjustment will most probably take at different points in development. With respect to antisocial behavior, this meant, for example, that misconduct in the home environment, friendship formation, and aggressive tendencies towards pupils and teachers at school have been intensively studied in early school age, whereas school dropout, truancy and affiliation with gangs have been more natural subjects of research in the older ages.

What then of the traditional argument against an idiographic approach in personality research, namely that it is oriented toward the case study and permits less generalization than its nomothetic counterpart? It should here be stressed that the person approach is not restricted to case studies, but permits, both in principle and in practice, generalizations. Individuals can be grouped in homogeneous categories on the basis of pattern similarity and investigated as a basis for generalizations. The advantage is that these generalizations refer to persons rather than to variables. Methods for using

data for clustering individuals in this way are rapidly developing (see e.g. Krauth and Lienert, 1973; 1982).

The choice, of course, in planning longitudinal research is not between studying individuals or variables. It is a matter of emphasis. Self evidently our emphasis on a person approach does not preclude the measurement of single variables. A developmental study of total individuals requires reliable and valid measures of the important person variables at each stage of development. The more reliable and valid data we have for specific variables, the more effectively can the study of development be performed by the person approach. This report is in fact concerned with an analysis of the role of one specific person characteristic that we assume, on the basis of earlier psychological and physiological research, is an important indicator of maladjustment, namely aggression.

The Purpose of the Present Report

The present report presents data on the empirical relationship between aggressiveness at the age of 10 to 13 and criminal behavior in adolescence and early adulthood. The results represent the first step in a process in which psychological, physiological and environmental factors will be investigated as determinants of prosocial and antisocial behavior in a longitudinal perspective.

Aggression as an individual characteristic. A prerequisite for using aggression as a person characteristic is that measures show some consistency over time and situations. In a review of studies of the stability of aggressive behavior patterns, Olweus (1979) found the degree of stability to be substantial and not much lower than that usually found for intelligence. These studies indicate that the age at the first measurement and the interval covered determine the degree of stability. For intervals of about 3 years between 10 and 13, stability coefficients, corrected for attenuation, are about .60 to .70 (Farrington, 1978; Olweus, 1977). For the period from adolescence to young adulthood stability coefficients between .50 and .70 are reported (see Kagan and Moss, 1962; Block, 1971).

Aggression and criminality. Whether we consider psychodynamic theory, traditional learning or modern social learning theory, aggression has been assumed to form one crucial basis in the etiology of crime. Specifically, it has been assumed to underly those criminal acts that involve harm or

violence to other persons, though not necessarily those against property. Empirically, despite the great importance attached to aggression in theoretical analyses, there have been but a few studies aimed at the investigation of early aggression and later criminality in a prospective longitudinal frame of reference. Where such studies occur they deal almost entirely with a comparatively short age span—most often from early school age to adolescence—and often do not cover the normal range of children but the extreme endpoints of the prosocial-antisocial continuum. Furthermore, the results of the studies that have been performed are not altogether conclusive, since aggression many times has been subsumed under wider concepts like socially disapproved behavior.

Farrington (1971) found support for a hypothesis that young aggressive boys and early delinquents were the same kind of individual. The conclusion formulated was that the most overtly aggressive schoolboys are the ones who make up the actual or potential delinquent populations. Early convictions for delinquency occurred when overt aggressiveness was coupled with a degree of social deprivation. In this study the boys rated themselves in aggressiveness.

In an 11-year longitudinal study, Feldhusen, Thurston and Benning (1973) identified children in grades 3, 6 or 9 who showed either prosocial (N = 982) or aggressive-disruptive (N = 568) behavior in school. They found early aggressive behavior to be highly predictive of later delinquency. In a followup study, Moore, Chamberlain and Mukai (1979) compared the incidence of court recorded offenses in one group who, 2–9 years earlier, had had problems with aggression at home, one group who had stealing problems and a third group of normals. The result showed that 77% of the adolescents with stealing problems had later court-recorded offenses, but that the aggressive subjects did not differ from the normal controls.

One cause of contradictory results may be that different concepts of aggression and different methods for data collection have been used. In a cross-sectional study, Rotenberg and Nachson (1979) found differences between a group of delinquent boys and a group of nondelinquents (14–17 years old) on an impulsiveness test but not in the results of an aggression test. These results confirmed the hypothesis of the authors that control of aggressive tendencies may be one aspect of aggression that is decisive in effects on development, whereas the strength of aggressive tendencies has only indirect effects.

Despite the great amount of research on delinquency and criminality from a lifespan perspective, little is actually known about the individual consistency over time of criminal behavior. From criminal records it is evident that criminal behavior occurs more frequently during late adolescence and young

adulthood than during any other period of life. After the age of 30 criminal rates decline steeply. Data from a number of investigations show that different types of crimes are committed at different ages (e.g. Glueck and Glueck, 1940; McCord and McCord, 1959). Crimes of violence, robbery and assault etc, are most frequent during the period 20–26, whereas property crimes show a decreasing trend after adolescent years. This fact raises the important question of whether the same persons commit these different types of crimes at different periods of their lives; i.e., if criminality is a stable person characteristic, either in terms of frequency or in terms of type or seriousness of crime.

In a review of longitudinal research on criminal behavior, Cline (1980) found only one study relevant to this issue, McCord's (1978) 36-year followup of the Cambridge-Somerville Youth study. Cline adapted these data to his model for the description of life span delinquency. In this model one group of delinquents and one group of non-delinquents in adolescence were each categorized into three subgroups on the basis of their criminal behavior during young adulthood. Adolescent delinquents who also committed serious crimes in adulthood and adolescent nondelinquents who were also nondelinquents in adulthood represent two stable patterns. Of the 506 subjects, 9.9 and 27.9%, respectively, belonged to these two stable subgroups. The others showed varying degrees of change.

It is remarkable that serious crimes in adulthood were committed by nearly as many adolescent nondelinquents (8.1%) as adolescent delinquents (9.9%). Fewer delinquents conformed to become noncriminal in young adulthood (5.7%). The rather low stability indicated by this one study may merely reflect the fact that individuals, to a considerable degree, differ in the types of crimes they commit and these types differ in frequency for different age groups. More studies are certainly needed with other samples and other social contexts to give more reliable information on the question of the constancy of criminal behavior.

The Present Study

Subjects

This study is based on data for subjects born in 1955. The subject population is defined as all male school children in a mid-Swedish town of about 100,000 inhabitants, who, in 1965, were receiving normal schooling grade 3 of the compulsory school. Earlier studies within the project have shown that

this group can be regarded as fairly representative of pupils in the compulsory school system in Sweden (Bergman, 1973; Magnusson, Dunér and Zetterblom, 1975).

The specific investigation group employed in the following analyses are performed on those boys for whom data on aggressiveness were obtained both at the age of 10 and at the age of 13. This group consisted of 412 boys.

Variables

Aggressiveness. Ratings on aggressive behavior were obtained from teachers. Aggressiveness was rated on a seven point scale with verbal descriptions of the extreme manifestations. These were as follows:

A.   They were aggressive against teachers and classmates. They may be impertinent and impudent, actively obstructive or incite to rebellion. They like disturbing and quarrelling with classmates.

B.   They work in harmony with the teachers and have positive contacts with classmates. Their relations to others easily become warm and affectionate.

Most children are between these two extremes.

The teachers were requested to bear in mind the normal distribution of pupils for the rated variable, and they were instructed to use the boys in their own class as reference group. Teachers ratings were obtained both in grade 3 (at the age of 10) and in grade 6 (at the age of 13). The ratings of aggressiveness were made by different teachers on the two occasions. The boys in each class were rated by one teacher. On both occasions each teacher taught his class in almost all subjects, and most of the teachers had known and observed their pupils for almost three years.

The coefficient for the stability of aggressiveness from 1965 to 1968 as rated by independent teachers was .48. A very conservative estimate of stability, corrected for attenuation, gives a stability coefficient for true measures of aggressiveness of .60.

In view of the high stability and to obtain a measure of aggressiveness minimizing the role of temporary circumstances, data on aggressive behavior were pooled for the ages of 10 and 13. A mean aggression score based on ratings on both occasions was calculated (transformed to a 7-point scale).

Criminality.   In a first phase, information on registered law-breaking was supplied by the National Police Board. Next, to ensure complete data,

especially data on offenses before 15 years of age, police authorities in all those police districts in which any one of the 412 subjects had lived up to 26 years of age supplied supplementary information on offenses. Third, proceedings taken by social authorities were collected from the Child Welfare Committee. With this procedure, data on registered crimes were obtained for all 412 boys.

In the following, the results on criminality are presented separately for the adolescent period (up to 17 years) and for adult life (18 to 26 years). Reported crimes are infrequent before 13, making 13 to 17 years of age the present age span for the adolescent period. For each period, three measures of reported offenses are reported:

(a)   Crime frequency.   The number of offenses occasions, irrespective of the number of categories of crime on each occasion.

(b)   Seriousness of crime.   Each reported crime is scaled according to "seriousness". The scale, principally based on strength of sanction connected with the crime, is a 4 point ordinal scale. Scale value 1 refers to more or less trifling offenses whereas the value 4 covers the most serious crime. (See Table 16–1.) To determine the seriousness of crimes committed, each person was assigned a score based on his offense with the highest scale value. In the present study values 1 and 2 together form "Mild offenses" and the values 3 and 4 form "Serious offenses".

(c)   Character of crime.   Offenses receiving a seriousness score of 2 or higher, were classified into one of the following three broad groups:

1.   Offenses against person (involving offenses against life and health; like assault, creating danger to another, causing bodily injury, etc.; offenses against liberty and peace, like unlawful coercion, threat and intrusion, breach of domiciliary peace, etc.; sexual offenses).
2.   Offenses against property (involving theft, robbery and other larceny, like petty theft, theft, arbitrary conduct etc.; fraud and dishonesty, like fraud, receiving stolen goods, smuggling of goods etc).
3.   Offenses endangering the General Public (arson, devastation, carelessness, endangering the public, offenses inflicting damage etc.; traffic offenses;   life carelessness in traffic, drunken driving, hit-and-run etc.).

To obtain a measure of the stability of crime, the frequency of committed

Table 16–1. Seriousness of crime

CHARACTER OF CRIME	Score 4:	Score 3:	Score 2:	Score 1:
OFFENSE AGAINST PERSON	Physical violence, assault, intrusion	Physical threat		
OFFENSE AGAINST PROPERTY	Grand theft and grand fraud	Theft and fraud	Petty theft and petty fraud	
OFFENSE ENDANGERING THE GENERAL PUBLIC	Grand devastation endangering the public	Carelessness endangering the public	Petty carelessness endangering the public	
FRAUDULENT CONDUCT	Grand fraudulent conduct	Fraudulent conduct	Petty fraudulent conduct	
NARCOTIC OFFENSES	Grand narcotic offenses	Narcotic offenses	Petty narcotic offenses	
ELSE				Minor offenses, petty offenses against public order

crimes was cross-tabulated for the periods adolescence and adult life. These results are shown in table 16–2.

Table 16–2 shows a clear cut relation for criminality, defined in terms of frequency of crimes, between adolescence and adult life (Chi square = 104.80 with 4 df, p < .001). The relation has a gamma value of .71. As can be seen from the table, 84% of the subjects with no registered criminality during adolescence have remained law abiding in adult life, whereas this is the case for only 7% (1 out of 15) among the subjects with criminal activity in the adolescent period.

Results

Early Aggressiveness and Delinquency

Of the boys forming the present study's investigation group one out of five (19.7%) have at some time during adolescence committed one or more offenses leading to reports to the police. Table 16–3 shows the percentage of registered offenses and percentage of mild and serious offenses for boys with different aggressiveness scores in early school age.

Table 16–3 illustrates a clear connection between expressed aggressiveness in early school age and later delinquency. The higher the aggressiveness score, the higher the probability that a boy will be found in the registers of police (Chi square = 81.51 with 18 df, p < 0.001; gamma = .54). One out of two boys with the highest aggressiveness scores have been convicted of

Table 16–2. The stability of number of committed offenses from adolescence to adult life: 412 male subjects

| | | *Adult life* | |
	No offense	*Sporadic offenses (1–3)*	*Frequent offenses (4 and more)*
Adolescence			
No offense	289	39	3
Sporadic offenses (1–3)	43	18	5
Frequent offenses (4 or more)	1	8	6

Table 16–3. Percentage with (a) registered crimes and (b) mild/serious principal offenses during adolescence of subjects with different aggressiveness scores at early school age

				Aggressiveness score				
Low	1 (n = 18)	2 (n = 35)	3 (n = 89)	4 (n = 120)	5 (n = 91)	6 (n = 45)	7 (n = 14)	High
(a) Number of offenses								
None	94.4	100.0	89.9	85.0	68.1	62.2	50.0	
1	5.6	0.0	9.0	10.0	11.0	17.8	7.1	
2–3	0.0	0.0	1.1	4.2	16.5	4.4	21.4	
4—	0.0	0.0	0.0	0.8	4.4	15.6	21.4	
(b) Serious-ness of principal offenses								
Mild	5.6	0.0	5.6	5.8	7.7	13.3	7.1	
Serious	0.0	0.0	4.4	9.2	24.2	24.4	43.8	

criminal acts, as compared to 5% of the boys with the lowest aggressiveness score. Of all offenses registered, 81% have been committed by those boys with an aggressiveness score of 5 or higher.

As can be seen from the table, there is an unequivocal relation between early aggressiveness and adolescent offense activity. Very few subjects with an aggressiveness score below 5 have committed more than three offenses during adolescence. The corresponding figures for boys with an aggressiveness score of 6 or 7 is 15.6 and 21.4%, respectively. Differently expressed we may say that of all subjects in the investigation group with frequent criminal activity (4 offenses or more) 67% belong to those groups of boys having an aggressiveness score of 6 or 7 at early school age (altogether 14.3% of the investigation group), and 86% of the criminality active have an aggressiveness score of 5 or higher (36.4% of the investigation group).

Highly aggressive boys in early grades commit more grave offenses. The percentage of boys committing serious crimes increases continuously with the degree of aggressiveness. About 44% of the boys with an aggressiveness score of 7 and 24% of the boys with a score of 5 or 6 have committed at least

one serious offense. Of all boys with serious offenses 72% have an aggressiveness score of 5 or higher at early school age.

Table 16–4 shows the percentage of subjects with different aggressiveness scores in early school age who have committed offenses against persons, against property and offenses endangering the public.

Generally, there is a monotonic, positive relation between the subject's position on the aggressiveness variable and the same subject's positions on all of the offense dimensions. Offenses against persons seem to be most highly connected with early aggressiveness and offenses against property least related. Those subjects who have been ascribed an aggressiveness score of 5 or higher (36.4% of the investigation group) make up 91.5% of all subjects with offenses against persons, 67.7% of those committing offenses against property and 71.3% of all subjects having committed offenses endangering the public.

Early Aggressiveness and Adult Criminality

Every fifth boy (19.2%) has committed at least one reported offense during the time period 18 to 26 years of age. Table 16–5 depicts the percentage of registered offenses and percentage of mild and serious offenses in adult life of subjects with different aggressiveness scores in early school age.

Table 16–4. Percentage with offenses against person, against property and offenses endangering the general public during adolescence of subjects with different aggressiveness scores in early school age

	Aggressiveness score						
	1 (n = 18)	2 (n = 35)	3 (n = 89)	4 (n = 120)	5 (n = 91)	6 (n = 45)	7 (n = 14)
Characteristics of reported offenses							
Offense against Person	0.0	0.0	0.0	0.8	6.6	6.7	14.3
Offense against Property	0.0	0.0	7.9	11.7	25.3	31.3	50.0
Offense endangering the General Public	0.0	0.0	2.2	3.3	4.4	15.6	28.6

Table 16–5 shows a surprising agreement with the results for the adolescent period shown in table 16–3. The higher the aggressiveness as rated by the teacher, the higher the percentage of boys having committed criminal offenses (Chi square $= 47.72$ with 18 df, $p < .001$; gamma $= .41$). Of all offenses reported to the police 70% were commited by boys with an aggressiveness score of 5 or higher.

The early aggressive boys are the same ones who in adult life are markedly criminally active. Of all boys in the research group with frequent criminal activity, defined as four offenses or more, 78.6% have been ascribed an aggressiveness score of at least 5 at early school age.

The early aggressive boys not only commit more offenses, to a considerable extent they also commit more serious crimes. Whereas serious offenses are virtually nonexistent for boys with early low aggressiveness, between 11 and 20% of the boys who received a score of at least 5 have committed serious crimes in adult age. 80.8% of all boys who committed serious crimes are precisely those with an aggressiveness score of 5 or higher.

Table 16–6 presents the percentage of boys with different aggressiveness

Table 16–5. Percentage with (a) registered number of crimes and (b) mild/ serious principal offenses in adulthood of subjects with different aggressiveness at early school age

				Aggressiveness score				
	Low	1 (n = 18)	2 (n = 35)	3 (n = 89)	4 (n = 120)	5 (n = 91)	6 (n = 45)	7 (n = 14)	High
(a) Number of offenses								
None		94.4	88.6	89.9	83.3	78.0	57.8	57.1
1		5.6	5.7	4.5	10.8	11.0	17.8	0.0
2–3		0.0	5.7	3.4	5.0	5.5	15.6	28.6
4–		0.0	0.0	2.2	0.8	5.5	8.9	14.3
(b) Serious ness of principal offenses								
Mild		5.6	11.4	9.0	13.3	11.0	22.2	28.6
Serious		0.0	0.0	1.1	3.4	11.0	20.0	14.3

scores having committed offenses against persons, against property and offenses endangering the public in adult life.

The percentage figures in table 16–6 for different kinds of crimes correspond closely to the figures for the adolescent period presented in table 16–4, with the possible exception of the relatively lower percentage in adult life for boys with an aggressiveness score of 7. As for the adolescent period, offenses against persons seem most strongly related to early aggressiveness and offenses against property least related. Subjects with an aggressiveness score of 5 or higher make up 92.3% of all subjects in the investigation group with offenses against persons, 54.6% of those committing offenses against property and 65.8% of all subjects who committed offenses endangering the public.

As an overview of the total registered criminality for the subject group, table 16–7 presents the percentage of registered offenses and percentage of mild and serious crimes both during adolescence and in adult life of subjects with different aggressiveness scores in early school age.

Table 16–7 illustrates separately two main tendencies described above for the adolescent period and adult life, respectively. First, the higher the aggressiveness value as rated by the teachers in early school grades, the higher the criminal activity and the more serious are the offenses reported. It is notable that about 55 to 60% of those boys with an aggressiveness score of 6 and 7 have committed at least one offense up to 26 years of age. Persons

Table 16–6. Percentage with offenses against person, against property, and offenses endangering the general public in adult life of subjects with different aggressiveness scores in early school age

	Aggressiveness score						
	1 *(n = 18)*	*2* *(n = 35)*	*3* *(n = 89)*	*4* *(n = 120)*	*5* *(n = 91)*	*6* *(n = 45)*	*7* *(n = 14)*
Characteristics of reported offenses Offense against Person	0.0	0.0	0.0	0.8	6.6	11.1	7.1
Offense against Property	5.6	8.6	6.7	11.7	13.2	28.9	28.6
Offense endangering the General Public	0.0	2.9	6.7	4.2	8.8	26.7	21.4

Table 16-7. Percentage with (a) registered number of crimes and (b) mild/ serious principal offenses of subjects with different aggressiveness scores at early school age

				Aggressiveness score				
Low	1 (n = 18)	2 (n = 35)	3 (n = 89)	4 (n = 120)	5 (n = 91)	6 (n = 45)	7 (n = 14)	High
(a) Number of offenses								
None	88.9	88.6	83.1	72.5	60.4	44.4	42.9	
1	0.0	5.7	4.6	10.0	16.5	13.3	14.3	
2–3	11.1	5.7	10.1	15.8	13.2	15.6	7.1	
4–	0.0	0.0	2.2	1.7	9.9	26.7	35.7	
(b) Serious- ness								
Mild	11.2	11.4	11.2	16.7	11.0	18.0	14.3	
Serious	0.0	0.0	5.6	10.9	28.6	35.5	42.8	

with frequent criminal activity are predominantly recruited from these groups of boys with high aggressiveness in early school age. Of all subjects who committed four offenses or more up to 26 years of age, 87% are boys who at early school age were given an aggressiveness score of 5 or higher. These results make is safe to conclude that early aggressiveness is a vitally important predictor of later criminality. We may speak of the highly aggressive pupils as a potential criminal risk group.

Second, although we cannot accurately predict the individual level on which boys in early grades will actually commit crimes, but can merely circumscribe a potential group at risk, we are in a better position to determine which pupils will not be found later in official police records (cf. Olofsson, 1971; Robins, 1966). The prediction that subjects with low aggressiveness will not commit frequent and serious offenses is strong both at the group and individual level.

Summary and Discussion

Having observed the systematic, strong relationship between early aggressiveness and adult criminality, the question of determining factors arises. Further research in the project will concentrate on three kinds of factors, that

may operate—independently or in conjunction with each other—behind aggressiveness and criminal behavior: (a) psychological person factors, (b) physiological person factors and (c) environmental factors.

(a) Psychological Person Factors

One group of important psychological factors that may lie behind and lead to both aggressiveness and criminal behavior includes high and immediate need of gratification and lack of impulse control. A study by Rotenberg and Nachshon (1979), indicates that control of aggressiveness impulses and the strength of such impulses are separable variables with different implications for delinquent behavior. The linkage between low impulse control and lack of ability for delay of gratification and aggressiveness is supported by high correlations between ratings of aggressiveness and ratings of motoric uneasiness and hyperactivity in the classroom among the boys in the experimental group in the present study. Further, the most aggressive boys are rated as having very low motivation for school work by both teachers and peers, although they do not rate themselves lower than average in satisfaction with schoolwork. This may indicate that the immediate acting impulses lead to sufficient need gratification for these boys. This line of thinking will be followed in further empirical research in the project.

(b) Physiological Person Factors

Recent research on physiological correlates of aggressiveness and of maladaptive behavior indicates relationships that seem to be of great interest for the causal analysis of criminal behavior. Evidence has been gathered documenting the role of catecholamines in aggressive behavior. It was earlier maintained that aggressive "anger out" reactions were accompanied by changes in noradrenaline rather than adrenaline excretion (supposed to underlie anxiety), and that aggressive personalities should have a relatively higher level of noradrenaline excretion (Funkenstein, 1956). Although these assumptions have received some support (Cohen and Silverman, 1959; Fine and Sweeny, 1968), both noradrenaline and adrenaline have been shown to be related, but not convincingly differentially so, to the intensity of aggressiveness states, as well as to other unpleasant and pleasant emotional states (Levi, 1965). The evidence for a specific noradrenaline-aggression trait association is also far from clear (Frankenhaeuser, 1971). What seems to be the case is a positive correlation between good social adjustment on the

part of subjects and adrenaline excretion (Lambert, Johansson, Frankenhaeuser and Klackenberg-Larsson, 1969).

Results from studies on the relationship between experimental stressors and catecholamine output have shown a sensitivity especially for adrenaline excretion in anticipatory situations characterized by novelty, uncertainty and change (cf. Frankenhaeuser and Rissler, 1970). In a study in our longitudinal project, Johansson, Frankenhaeuser and Magnusson (1973) found negative relationships between adrenaline excretion and teachers' ratings of aggressiveness, hyperactivity, distraction and emotional disharmony. The coefficients of correlation were significant during an "active" but not during a "passive" period. The study was performed on the same group of subjects as in the present study, and the experiment was performed when the boys were 13 years of age. In the passive period the subjects viewed a motion picture on iron-ore mining, and the active period consisted of the performance of a mental arithmetic test. No clear cut tendencies were obtained for noradrenaline excretion.

A few recent studies have analyzed the relationships between criminality and catecholamine output. Lidberg, Levander, Schalling and Lidberg (1978) found that a subgroup of arrested men high in psychopathy (low socialization, high impulsiveness, low empathy) showed a considerably lower increase in adrenaline and noradrenaline excretion than arrested men low in psychopathy when faced with an imminent strong real life stressor— forthcoming trial—than in less stressful situations. Woodman, Hinton and O'Neill (1977a,b) reported increased noradrenaline and decreased adrenaline excretion for a subgroup of maximum security patients convicted for physical violence offenses as compared to mixed offenders and normal control subjects. In a subsequent study (Woodman and Hinton, 1978), some deviant subjects convicted for extreme physical violence showed abnormally high noradrenaline to adrenaline ratios during a period of anticipation of stress compared to mental hospital patients and normals. Under routine conditions the ratios were lower and about the same level for the groups.

In view of the fact that in the present study early aggressive behavior has been found to be strongly related to later criminal activity during adolescence and young adulthood, the question obviously arises whether a consistent pattern of adrenaline and noradrenaline excretion relationships are obtained both with respect to aggressiveness and with respect to registered offenses in adolescence and in adulthood. Tables 16–8 and 16–9 present data on this issue for catecholamine output at the age of 13 (see Johansson, Frankenhaeuser and Magnusson, 1973, for further details of the experiment).

Boys with the highest rated aggressiveness and boys who in adolescence

Table 16–8. Noradrenaline and adrenaline excretion (ng/min) during active and passive periods for boys with different aggression scores—age 13

| | Aggression score | | | | | | | | | | | |
| | Low 1–2 (n=7) | | 3 (n=22) | | 4 (n=29) | | 5 (n=22) | | 6–7 High (n=11) | | F | F prob. |
	M	SD	M	SD	M	SD	M	SD	M	SD		
Noradrenaline: passive	25.167	6.885	21.766	10.425	22.630	9.485	23.785	8.529	19.889	6.249	0.531	0.716
Noradrenaline: active	23.157	4.617	21.195	9.403	22.820	14.390	21.280	7.636	19.314	5.047	0.286	0.886
Adrenaline: passive	8.399	4.191	10.563	8.482	8.139	4.436	8.052	4.208	4.980	2.026	1.966	0.106
Adrenaline: active	14.179	5.848	11.682	7.095	12.042	7.457	9.787	5.311	7.693	3.141	1.622	0.175

Table 16–9. Noradrenaline and adrenaline excretion (ng/min) during active and passive periods for boys at age 13; subjects grouped according to committed registered offenses in adolescence and in adult life

	Offense Frequency							
	No crime		Sporadic crime (1–3 offenses)		Frequent crime (4 or more off.)		F	F prob.
	M	SD	M	SD	M	SD		
Adolescence	(n = 73)		(n = 19)		(n = 6)			
Noradrenaline: passive	22.357	8.678	24.004	10.192	18.972	7.163	0.749	0.480
Noradrenaline: active	21.763	11.052	20.241	7.928	21.002	5.268	0.170	0.843
Adrenaline: passive	8.462	5.758	9.298	5.613	4.563	1.552	1.665	0.193
Adrenaline: active	11.224	6.509	12.128	6.349	6.035	2.482	2.185	0.116
Adult life	(n = 73)		(n = 16)		(n = 8)			
Noradrenaline: passive	23.246	9.097	19.045	8.688	22.244	6.216	1.482	0.231
Noradrenaline: active	22.372	10.987	17.401	7.503	20.668	4.034	1.604	0.205
Adrenaline: passive	9.278	6.046	5.648	2.898	5.711	2.501	3.947	0.022
Adrenaline: active	11.992	6.817	7.999	3.976	8.825	3.773	3.236	0.043

and in young adulthood are the most criminally active show considerably lower adrenaline excretion both during the passive and during the active test condition. No consistent relationships are obtained for noradrenaline excretion.

So far we have no firm hypothesis about the role of physiological factors as causal factors, as concomitants and/or as effects in the process underlying aggressiveness and criminality. However, the results presented above indicate that psychophysiological processes may play an important role that cannot be neglected in further research.

(c) Environmental Factors

An individual's way of perceiving and interpreting the outer world, his way of dealing with internal problems as well as his specific way of coping with the external world are formed in a continuous interaction process with his environment in its physical, social and cultural manifestations (Magnusson, 1981). Both in a developmental and in a current perspective the environment can promote or prohibit prosocial and antisocial behaviors. This statement implies, among other things, that a change in environment may lead to a change in aggressiveness, for example. Thus, aggressiveness and criminal behavior cannot be investigated and understood effectively without also considering environmental factors. Of primary importance in the development of a person's partially unique way of dealing with his environment is the family in which he grows up. Earlier research has shown the importance of such factors as socioeconomic standard, consistency in upbringing patterns etc. (Humble and Zettergren, 1974; West and Farrington, 1977; Wolfgang, Figlio and Sellin, 1972). To illustrate the moderating effect of socioeconomic status on the aggressiveness-criminality relationship, Table 16–10 presents the percentage of boys with registered offenses in adolescence and in adulthood grouped according to early aggressiveness (AGGR) and different levels of parental education (PE). High parent education refers to education above lower secondary school and low parent education to unskilled labor and labor with vocational training.

In line with our expectations, it is predominantly the group of highly aggressive boys with parents with a low level of education that are at risk for future criminal acts. However, parents' education as a general measure of socioeconomic status is a rather crude variable reflecting a variety of converging person-environmental processes, such as opportunity for learning, family relations, parental expectations, upbringing ideology etc., and, most important, hereditary influence. To what extent these and other within-

Table 16–10. Percentage of subjects with registered offenses during adolescence and adult life. Subjects grouped according to level of parents' education and aggressiveness

	Adolescence	Young adulthood
High PE—Low AGGR	2.6	7.9
High PE—Moderate AGGR	11.5	12.2
High PE—High AGGR	23.8	28.6
Low PE—Low AGGR	0.0	13.3
Low PE—Moderate AGGR	24.8	18.6
Low PE—High AGGR	51.4	48.6

familial factors are causal, or how they operate in the total process is still mainly unknown. These are central problems in the future research of the project.

Planning for Further Research

An investigation of the role of person and environmental factors in the development of and current expression of aggressiveness and criminality presupposes access to proper data at adult age. To meet this requirement, data collection at this age has been planned and is now being carried through. An inventory covering educational and vocational career, family life, working conditions, leisure time activities and social network habits has been administered to all those who have participated in any previous data collection (1,390 subjects). It has been answered by 85% of the subjects. Each subject in a sample of 250 boys and girls who have been more intensively studied is now being interviewed in a two hour interview covering different objective and subjective aspects of the subjects' life situations. They also participate in a two-hour testing session in which intellectual functioning is measured and personality inventories are administered. For each of the subjects blood and urine samples will be collected and examined (by endocrinologists and pharmacologists, with whom we cooperate) with respect to level of substances of particular interest, for example, testosterone, adrenaline, noradrenaline, dopamine etc. These data will form the basis for investigating the interplay of person and environmental factors in the process underlying the manifestations of maladaptive behavior in terms of criminality.

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17 LINEAR CAUSAL MODELING OF ADAPTATION AND CRIMINAL HISTORY IN SEXUAL OFFENDERS

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Introduction

The etiological roots of aggression, and more specifically of delinquency and criminality, have been the focus of numerous retrospective and prospective, followup and longitudinal studies (e.g., Farrington, 1978; Glueck and Glueck, 1950; McCord, 1979; Robins, 1966). Although our knowledge of the causes and courses of criminal histories still remains rudimentary (Farrington, 1979), there have been major advances in the specification of the domain of variables that need to be considered in the creation of causal models. A host of variables have been found to covary with youthful aggression and delinquency, including: (a) social and economic variables like family income and size (Farrington, 1978); (b) specific family interaction and parental childrearing patterns like harshness of punishment and discipline, marital disharmony, lax discipline, poor supervision, and rejection (Bandura and Walters, 1959; Eron, Walder, Toigo and Lefkowitz, 1963; Farrington, 1978; Farrington and West, 1971; Glueck and Glueck, 1950;

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Lefkowitz, Eron, Walder and Huesmann, 1977; McCord, McCord and Howard, 1961; McCord, McCord and Zola, 1959; Quinton, Rutter and Rowlands, 1976; Wirt, Hampton and Seat, 1972); (c) parental characteristics like criminality (Farrington, 1978; Glueck and Glueck, 1950; McCord and McCord, 1958); (d) subject characteristics like daring, low IQ, and poor school attainment, poor social skills and poor peer acceptance (Farrington, 1978; Janson, 1982; Roff, 1972; Wirt et al., 1972).

A remarkably similar set of variables predicts adult conduct disorders and psychopathy: (a) social and economic variables like low SES and large families (Eron, Walder and Lefkowitz, 1971; Roff, 1974); (b) specific family interaction and parental childrearing patterns including broken homes, neglect and abandonment, cruelty to the child, inadequate control and supervision, and punitive childrearing (McCord, 1979; Roff, 1974); (c) parental characteristics like trouble with the law, criminality, promiscuity, paternal psychopathy and alcoholism, maternal lack of affection, low self confidence, and bearing of illegitimate children (McCord, 1979; Robins, 1966; Roff, 1974); and (d) subject characteristics like truancy, school failure, and conduct problems in school, arrests and frequent contact with the law, and drug use and drinking, precocious sexual activity, and aggressiveness (Lefkowitz et al., 1977; Robins, 1972; Roff, 1974). Recently, biological and genetic variables have also been added to the list of possible precursors of criminality (Hutchings and Mednick, 1974; Mednick and Christiansen, 1977; Gabrielli and Mednick, 1983; Schulsinger, 1972; Van Dusen, 1983).

Despite some agreement about the domain of variables that seems to contribute to delinquency and criminality, the particular weight of each predisposing variable and its location and function in the causal nexus is far from certain. Testing of such causal models to predict global aggressive or criminal outcome has only begun (Buikhuisen and Meijs, 1983; Lefkowitz et al., 1977; Olweus, 1980; Robins, 1972). A major aim of the present study is to contribute to this growing literature by examining a particular model of the developmental precursors of sexual violence, an area of criminality that has received little empirical scrutiny. Although clinicians studying the case histories of sexual offenders have noted the prevalence of many of the developmental variables cited above, substantive empirical investigation of these antecedents is lacking.

This choice of a particular sample of offenders (i.e., sexually dangerous persons) immediately raises the question of the representativeness of such a select sample to the general criminal population. Some research has directly addressed this issue and suggested that sex criminals are not very different from other violent criminals (e.g., Lewis, Shanok, Pincus and Glaser, 1979).

Moreover, it has been found that rapists and other dangerous sex offenders had more prior and subsequent property offenses than sex offenses (Christiansen, Elers-Nielsen, LeMaire and Sturup, 1965; Soothill and Gibbens, 1978; Soothill, Jack and Gibbens, 1976). In fact, in general criminal behavior, the probability of committing a particular kind of crime is independent of the type of the immediately preceding crime (Wolfgang, Figlio and Sellin, 1972; Thornberry and Figlio[1]). Such data have led Farrington (1979) to conclude that typologies of offenders that are based simply on crime patterns have limited value.

Clinicians working with sexual offenders, however, have hypothesized that while some sex offenders appear to be career criminals whose sexual crimes are merely isolated acts in a multitude of offenses, repetitive and violent sexual offenders (the subjects of this study) constitute a separate and distinct group (Cohen, Garofalo, Boucher and Seghorn, 1971; Cohen and Boucher[2]). Although the present study will not be able to resolve this issue, it will provide data that will help determine whether the variables that have been found to precede and predict aspects of general criminality are also precursors of similar aspects of sexual violence. Moreover, since this sample is readily divisible into rapist and child molester subsamples, we will be able to assess the relative strength of differential developmental histories within subgroups of this sample.

In creating our causal model of sexual violence, we included as possible precursors all those variables listed above that we could adequately assess from our extensive clinical files. In addition to these variables, we examined early physical and sexual abuse. The former, which is frequently found in the histories of institutionalized men with problems of assaultive behavior (Blount and Chandler, 1979), was frequently reported in the case histories of our offenders and has been found prevalent in other samples of sex offenders (Marshall and Christie, 1981). Moreover, although the child abuse literature is riddled with definitional, sampling, and measurement problems (Kinard, 1980), it has consistently been found that physically abused children are at increased risk for problems of aggression and for poor peer relations (Kent, 1980; Reidy, Anderegg, Tracy and Cotler, 1980). Although our understanding of the long term effects of sexual abuse is not conclusive (Mrazek, 1980), it has often been hypothesized that child molesting is more common in adults who were themselves sexually abused in childhood (Brant and Tisza, 1977; Seghorn and Boucher[3]). Thus, it seemed appropriate to include sexual abuse in our model.

Much of the longitudinal research on criminality has focused on the global prediction of antisocial behavior in adulthood, not on the specific nuances predisposing someone to act out in a particular manner. The lack of

specification both of the multiple dimensions of adult adaptation and of the numerous factors involved in criminal activity might conceal important relations. This may be especially true for sex offenders, who clearly constitute a heterogeneous group. Offenders with widely varying degrees and kinds of criminal activity and who differ in age, background, personality, psychiatric diagnosis, race, and religion are all lumped together if there appears to be the slightest indication of aberrant sexual activity in their criminal histories (Amir, 1971; Apfelberg, Sugar and Pfeffer, 1944; Frosch and Bromberg, 1939; Henn, Herjanic and Vanderpearl, 1976; McCaldron, 1967; Mohr, Turner and Jerry, 1964; Rada, 1975, 1976; Shaskan, 1939). Their sexual offenses are also markedly heterogeneous with respect to the sex and age of the victim, the location and time of the offense, the degree of planning, and the amount of violence. In addition, aspects of the offense may be affected by the victim's response. In sum, each sexual offense is an amalgam of interrelated elements. Therefore, an adequate causal model must reflect this diversity in outcome criteria, attempting to account for both the multitude of adaptations of offenders and the important variants in their sexual offenses. A goal of the present study was to specify empirically the essential dimensions of adult adaptation and criminal activity of these offenders so as to provide a diversified criterion network for predictive mapping. Our efforts in this task were guided by our review of the variables that have proven important in outcome studies of deviant and criminal populations (e.g., Knight and Roff, 1983; Lefkowitz et al., 1977; Robins, 1966) and more specifically by the dimensions underlying three relevant typologies, one developed to discriminate among aggressive individuals (Megargee, 1966) and two others developed to discriminate types of sexual offenders (Cohen et al., 1971; Rada, 1978).

Megargee (1966) has postulated that extremely aggressive individuals could be identified as one of two distinct personality types: "overcontrolled" or "undercontrolled." The overcontrolled individual is overly inhibited in the expression of anger, tending to internalize until the buildup culminates in an explosive act. As an offender, this individual would commit few, albeit very violent, crimes. The undercontrolled individual possesses little restraint, typically acting out quite often. As an offender, this individual would have a long criminal record, though not marked by extreme violence. This typology, particularly the overcontrolled type, has received considerable support (Blackburn, 1968a, 1968b, 1969; Houts, 1970; Megargee, 1971, 1972, 1976; Molof, 1967; Staub, 1971; White, McAdoo and Megargee, 1973). The operant variables in this typology—the frequency and assaultiveness of crimes—were operationalized for our database and incorporated as criterion

variables. These two dimensions have, of course, been widely used in criminality research.

The most comprehensive taxonomy of sexual aggression (Cohen et al., 1971) has focused on the multiplicity of elements in the sexually violent act and has attempted to isolate the aspects of the offense that give it its unique form and its meaning for the offender. For rapists the amount and nature of the violence, the psychosexual meaning of the crime for the offender (i.e., the degree to which it compensates for real or perceived unmet masculine sexual/power needs), and the behavioral style (impulsivity, planning, etc.) of the act are hypothesized to be important elements. For child molesters the degree and nature of the violence, the motivation and behavioral style of the act, and the degree to which the offense represents a chronic fixation on the child as object rather than a regression from a previously achieved, more appropriate, adult object have been isolated as crucial variables in the crime. Thus in addition to Megargee's (1966) degree of aggression and frequency of offenses, this typology would suggest for our population that the impulsivity of the crime, its ability to satisfy compensatory needs in the offender, and the general level of attained and current social competence in the offender are important criterion variables.

Finally, the important work of Rada (1975, 1978) has indicated that two additional variables should be considered in assessing the adaptation of sex offenders—substance abuse and the level of psychopathology.

In this study, therefore, we will be examining an exploratory causal model for sexual violence, investigating specific paths that might exist between the large number of predisposing variables we have measured and the multi-dimensional criterion matrix of adult characteristics and specific aspects of adult criminal activity. The model will be applied both to the entire sample of offenders and separately to rapists and child molesters to determine whether different causal paths exist within these broadly defined types.

Method

Subjects

The subjects for the present study were 125 convicted male sexual offenders committed to the Massachusetts Treatment Center in Bridgewater. This facility was established in 1959, under Chapter 123A of the Massachusetts General Laws, for the evaluation and treatment of Sexually Dangerous

Persons. A Sexually Dangerous Person is defined under this law as an individual

> ... whose misconduct in sexual matters indicates a general lack of power to control his sexual impulses, as evidenced by repetitive or compulsive behavior and either violence or aggression by an adult against a victim under the age of sixteen years, and who as a result is likely to attack or otherwise inflict injury on the objects of his uncontrolled or uncontrollable desires.

Any sexual offender, upon conviction or while serving a criminal sentence, may be referred to the Treatment Center for evaluation. After a sixty day period of observation, the individual is returned to court. If determined to be a "sexually dangerous person," he may receive a civil, indeterminate (day-to-life) commitment to the Treatment Center in lieu of or in addition to a prison sentence. Of the more than 1,400 men evaluated to date at the Treatment Center, approximately 450 have been committed: 280 of these committed offenders have been released after varying lengths of treatment, and 170 were in residence at the time this study was conducted. The present sample was drawn from the latter group and thus is a select subset of convicted sexual offenders in Massachusetts, consisting primarily of individuals convicted of repetitive and/or violent acts of rape, attempted rape, or child molestation. For the purposes of this paper, the term "rapist" refers to an individual whose offenses have been committed against adult women (i.e., 16 years of age or older). The term "child molester" refers to one whose offenses involved victims under the age of 16 years.

Data reported here are based on 125 patients on whom data collection was complete at the time of analysis. Racially, 84% of the sample was Caucasian and 16% was nonwhite (Black, Hispanic, or Native American). Subjects' ages ranged from 18 to 68, with an average age at commitment of 29 and an average age at present of 35. The mean IQ for the sample was 98.4 with a range from 61 to 132. Educationally, the mean grade level attained was 9.4, with a range from the third grade to a Masters degree. The vast majority of the subjects (91%) had previously served prison time, and half had been incarcerated more than once. The mean number of serious sexual offenses (i.e., those involving physical contact with the victim) prior to commitment was 3.9, with a range from 1 to 19.

The primary data source for each subject was his clinical file, which included all information gathered during the patient's evaluation and commitment periods at the Treatment Center. Post-commitment information routinely available included such Treatment Center records as treatment summaries, behavioral observation reports, work reports, summaries of program participation, and results of any diagnostic assessments. Informa-

tion collected during the patient's observation period included, in addition to reports of diagnostic assessments and clinical interviews conducted as part of the evaluation itself, data from multiple sources external to the Treatment Center, such as past institutionalization records, school and employment reports, police reports, court testimony, parole summaries, probation records, and social service notes. These reports not only originate from different agencies, but were also written at different points in the subject's life to describe events as they were occurring at that time. In many cases, social service and school reports were available that predated the subject's first arrest or legal involvement. Access to these original reports helped to counteract the restrospective biases inherent in file research based largely on summary reports of a subject's life written after events of particular importance have already taken place (in the case of this study, after the onset of criminal activity).

Although the inclusion of information from multiple sources in the clinical files contributed greatly to the wealth of data available for study, it should be noted that it resulted as well in problems related to contradictory or missing information characteristic of all file research. The unstandardized nature of clinical recordkeeping, particularly across agencies, resulted at times in discrepant information for a given subject. In addition, since subjects varied considerably in the extent and nature of their precommitment contacts with social service and criminal justice agencies, and in their programs at the Treatment Center, some inconsistency characterized as well the amount and types of information available across subjects.

Unstandardized as such clinical files are, however, they can be a rich source of data, as demonstrated by previous studies that have fruitfully explored similar records (Knight, Roff, Barrnett and Moss, 1979; Nameche, Waring and Ricks, 1964; Robins, 1966; Waring and Ricks, 1965). Procedural attempts to minimize the effects of inconsistent information are described more fully below, but the implications of such inconsistency for the interpretation of results bear mention here. Inconsistency across files would contribute to a conservative bias against finding relationships between the variables involved, and failure to document expected relationships must be evaluated with this in mind. On the other hand, relationships that emerge despite this conservative bias may be regarded as especially strong candidates for further study.

Procedure

File coding. Approximately 800 to 1600 bits of data were coded from each file (the exact number depended on the number of sexual offenses a subject

had committed, since up to 100 variables were coded for each offense). These codings were made with the use of a data schedule composed of three parts. The first part covered demographic information and the subject's educational, occupational, military, medical, psychiatric, and institutional histories. This part also included inquiry in the areas of alcohol and drug abuse and criminal history. Additionally, data were collected on the subject's family and developmental history with regard to family composition, stability, etc. Psychiatric, medical, and substance abuse histories of caretakers (biological and/or surrogate) were explored, as were family histories of neglect, abuse, and incest. The second part of the data schedule was comprised of a set of rationally derived scales which globally assessed the subjects on various aspects of social competence, aggression, antisocial behavior, and offense style. The third part of the data schedule was a symptom checklist used to code the presence, severity, and/or chronicity of various clinical and behavioral symptoms.

To maximize the accuracy of the coded information, two trained research assistants, blind to hypothesized relationships among the variables under study, rated each file and then met to resolve all discrepancies through a consensus procedure. The consensus codings served as the basis for all analyses. In addition, the coders also abstracted from the files selected case history material on each subject which served as the data source for two additional data collection procedures described below.

Assessment of personality disorder and degree of psychopathology.
Three raters used the clinical file abstracts to assess personality disorder along dimensions outlined by Millon (1969). Three five point scales involved in these assessments were included in the present analyses. These scales covered the dimensions of 1) detachment (i.e., the degree to which the subject obtains reinforcement or gratification from himself or others); 2) the relative passivity/activity of the instrumental behavior employed by the subject in seeking such reinforcement or gratification; and 3) the severity of psychopathology evidenced by the subject along a continuum from mild to moderate to severe. Two raters independently assessed each subject and then, as in the file codings, met to resolve disagreements and arrive at consensual ratings.

Assessments of offense behavior.   Two other raters used the file abstracts to assess two aspects of offense behavior not included in the file codings. First, frequency and "density" of overall offending were assessed through the computation of two ratios: 1) a ratio of the total number of offenses (sexual

and nonsexual) to the offender's total on-street time (age at commitment minus all previous institutional time), yielding a measure of criminal activity controlled for "opportunity to offend,"; and 2) a ratio of the total number of offenses to the number of "active" years (i.e., those years in which at least one offense was committed), providing some approximation of the "clustering" of offenses. Additionally, highest degree of violence across all offenses (sexual and nonsexual) was assessed by means of a five point scale. Since the first two ratios were strictly quantitative, judgments were made independently and reliability was not assessed. Interrater agreement for degree of violence was 90% on the first 25 cases.

Data Analysis

Briefly summarized, prediction of aspects of criminal career from life history variables included the following steps:

1) conceptual delineation of a preliminary structural model, with its attendant assumptions, and specification of subsets of criterion and predictor variables;
2) reduction through principal components analysis of each of these initial variable subsets into a manageable number of cohesive, stable constructs (Cooley and Lohnes, 1971);
3) application of a series of stimultaneous multiple regression analyses (Kenny, 1979; Spaeth, 1975) using item groups derived from the reduction phase.

Each of these steps requires further elaboration.

Delineation of the structural model. Although the database itself was not established longitudinally, our interest in assessing direct and indirect causal contributions of life history variables to criminal behavior led to the adoption of a temporally structured model in which criminal offense characteristics were the final criterion (distal) variables. Three subsets of antecedent variables were defined on the bases of increasing temporal proximity to the offenses. The first set, family/parental pathology, was considered exogenous; child/juvenile (i.e., prior to age 17) pathology and adult noncriminal incompetence/pathology were included as endogenous variable sets. For the purpose of preliminary path analytic interpretations, a weak causal order was assumed to link these temporally defined subsets of predictors to each other and finally to criminal behavior. Such a temporal ordering for the family/

parental and child/juvenile item sets was supported by an analysis of the age of the subjects at events in each subset. Our decision to consider the adult noncriminal behavior causally prior to adult criminal behavior derives from the assumption that general adult adaptation mediates between antecedent childhood variables and adult criminal outcome.

We initially attempted to include in the three predictor subsets all those variables found in the previous research literature cited in the introduction to predict delinquency or adult criminal behavior, especially sexual/aggressive criminal behavior. Only those variables that occurred with sufficient frequency and that were reliably rated were selected for analysis. In general, variables chosen for initial inclusion in the three predictor subsets assessed some aspect of pathology, maladjustment, deviance, or impaired competence. Specific contents of the three original data sets were as follows:

Family/Parental Pathology. (9 items): five dichotomous variables reflecting the presence/absence of a nonintact parental marriage, child neglect, physical child abuse, sexual child abuse, and sexual deviation not involving the subject in the family of origin; a global assessment of family instability along a 4-point scale; and three 2-point scales reflecting histories of substance abuse, psychiatric disorders, and criminality in one or both biological parents.

Childhood/Juvenile Behavior Pathology. (20 items): twelve dichotomous variables reflecting the presence/absence of alcohol abuse, drug abuse, arson, cruelty to animals, enuresis, running away, fighting, assaults on peers, assaults on teachers, vandalism, psychiatric institutionalizations, and outpatient contact with mental health professionals; four 4-point scales assessing presence and severity of late maturing, poor school achievement, learning disabilities, and truancy; and juvenile totals for victimless, nonsexual/victim involved, and serious sexual offenses.

Adult Incompetence/Pathology. (21 items): WAIS Full Scale IQ; scales reflecting levels of educational achievement, achieved occupational skill level, highest heterosexual pair bonding achieved and heterosexual pair bonding at the time of the latest offense, reliance on institutions as opposed to independent functioning in the community, and degree of social isolation, all of which were scaled such that higher scores represented lower achievement or poorer adjustment; a measure of the consistency of occupational skill level; a 7-point scale assessing level of unsocialized aggression apart from sexual offenses; four 4-point scales assessing the degree of alcohol abuse, frequency of drinking, coincidence of acting out and drinking, and the three 5-

point Millon dimensions of detachment, passivity/activity, and severity of psychopathology; a summative scale of impulsivity/antisocial behavior in general lifestyle based in part on DSM-III (*Diagnostic and Statistical Manual of Mental Disorders—Third Edition*) criteria; and four summative scales derived from a principal component analysis of the clinical and behavioral symptoms included in the third part of the data schedule: 1) Disturbed Thinking/Behavior; 2) Excessive/Deviant Sexual Behavior; 3) Somatic Concerns; 4) An unnamed component defined by the symptoms of grandiosity, manipulativeness, and swearing.

In choosing variables to represent the distal criterion set, offender's criminal history, an attempt was made to include as broad a coverage as possible. Given the comprehensiveness of the data schedule with respect to criminal offense information, some choices were necessarily made regarding the importance of predicting to different aspects of offending behavior. The 11 variables initially chosen covered aspects of the offender's nonsexual criminal history (total victimless offenses and total nonsexual, victim involved offenses), aspects unique to sexual offenses (total serious sexual offenses, degree of impulsivity—modal, lowest, highest—in sexual offenses, and level of unsocialized sexual aggression), as well as four variables assessed across all offenses—presence or absence of substance usage in conjunction with offenses, degree of violence, and the frequency and density ratios described above.

Data Reduction. To arrive at a manageable number of stable, internally consistent item groups to serve as input for the multiple regression analyses, each of the four subsets of variables described above was reduced through a series of principal components analyses with rotation to varimax. Components with eigenvalues > 1.0 were initially retained, and preliminary scales for each were computed from all variables loading $\geq .40$. Final derivation of the input scales for multiple regression took into account the component structure and was aimed at maximizing internal consistency (Cronbach's alpha). In general, to reduce problems of multicollinearity, any items that loaded significantly on more than one component were dropped.

It is not possible, given limitations of space, to provide a detailed statement of the data reduction of each item set. Since this information is critical for understanding the regression analyses, the results of these principal components analyses are presented in tables 17–1 to 17–4. A more comprehensive description of these can be obtained from the first author.

The final scales for the 15 components presented in these four tables were constructed by standardizing and summing the items listed for each component. Part of the rationale for using principal component analysis as

Table 17–1. Final Item-Groups Entered into Linear Structural Analysis[1]. Family and Parental Pathology.

Item-groups	Variables	Loadings	Interrater Reliability Individual/Average		% of Var.	e	a
Family Instability					41.2	3.71	.79
	Nonintact Parental Marriage	.88	.90	.95			
	Family Instability	.78	.71	.83			
	Child Neglect	.74	.74	.85			
Parental Substance Abuse/Physical Child Abuse					13.2*	1.19	.48
	Parental Drug/Alcohol Abuse	.83	.84	.91			
	Physical Child Abuse	.69	.90	.95			
Family Sexual Deviation					11.5	1.03	.58
	Child Abuse-Sexual	.88	.60	.75			
	Sex Deviation in Family	.70	.77	.87			

[1]Derived from principal components analysis, orthogonal solution. a = Cronbach's alpha, e = Eigenvalue.
*% of Var. inclusive of two omitted variables.

Table 17–2. Final Item-Groups Entered into Linear Structural Analysis[1]. Childhood/Juvenile Behavior Pathology.

Item-Groups	Variables	Loadings	Interrater Reliability Individual/Average		% of Var.	e	a
Acting Out	Drug Abuse	.47	.90	.95	23.0*	4.15	.76
	No. of nonsexual/victim offenses	.59	.95	.97			
	Running Away	.41	.88	.94			
	Assaults on peers	.70	.58	.73			
	Assaults on teachers	.83	.65	.79			
	Vandalism	.55	.51	.68			
	Truancy	.44	.58	.73			
Social/Academic Incompetence	Late Maturing	.68	.43	.60	15.1	2.72	.76
	Poor School Achievement	.71	.51	.68			
	Learning Disabilities	.75	.87	.93			
	Social Isolation	.60	.57	.73			
	Drug Abuse	−.43	.90	.95			
	Alcohol Abuse	−.56	.80	.88			
Psychiatric System Contact	Psychiatric Institutionalization	.64	.80	.88	8.8*	1.58	.57
	Outpatient mental health contact	.65	.73	.84			
	Running Away	.49	.88	.94			
Destructiveness	Arson	.86	.91	.95	7.6	1.36	.61
	Cruelty to Animals	.71	.95	.97			
	Vandalism	.48	.51	.68			

[1]Derived from principal components analysis, orthogonal solution. e = Eigenvalue, a = Cronbach's alpha.
*% of Var. inclusive of one omitted variable.

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Table 17–3. Final Item-Groups Entered into Linear Structural Analysis[1]. Adult Incompetence/Pathology.

Item-Groups	Variables	Loadings	Interrater Reliability Individual/Averge		% of Var.	e	a
Alcohol Abuse					26.2	4.72	.96
	Alcohol Abuse-Lifetime	.94	.73	.84			
	Alcohol Abuse-Recent	.95	.74	.85			
	Frequency of Drinking	.92	.87	.93			
	Coincidence Acting Out & Drinking	.92	.84	.91			
Interpersonal Incompetence					18.3	3.30	.88
	Independence-Institutionalization	.78	.76	.86			
	Heterosexual Pair Bond-Achieved	.92	.65	.79			
	Heterosexual Pair Bond-Offense	.92	.78	.88			
Academic/Vocational Incompetence					10.8	1.95	.77

Antisocial Behavior			
Educational Achievement	.59	.75	.86
Achieved Skill Level	.84	.72	.84
Consistency of Skill Level	-.86	.55	.71
	9.8	1.77	.61
Unsocialized Aggression	.79	.63	.77
Activity of Instrumental Behavior	.58	.60	.75
Impulsivity in General Lifestyle	.75	.66	.80
Grandiosity/Manipulativeness/Swearing	.67	.67	.80
Severe Psychopathology/Sexual Pathology			
	6.5	1.67	.49
Social Isolation	.52	.45	.62
Severity of Psychopathology	.67	.81	.90
Disturbed Thinking/Behavior	.75	.76	.86
Excessive/Deviant Sexual Behavior	.61	.76	.86

[1] Derived from principal components analysis, orthogonal solution. e = Eigenvalue, a = Cronbach's alpha.

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Table 17–4. Final Item-Groups Entered into Linear Structural Analysis[1]. Criminal Offense Characteristics.

Item-Groups	Variables	Loadings	Interrater Reliability Individual/Average	% of Var.	e	a
Sexual Offense Impulsivity				27.2	2.99	.83
	Sex Offense Impulsivity-Modal	.90	.46	.63		
	Sex Offense Impulsivity-Lowest	.83	.54	.70		
	Sex Offense Impulsivity-Highest	.79	.41	.58		
Aggression				17.4*	1.91	.86
	Unsocialized Sexual Aggression	.90	.76	.86		
	Degree of Violence	.91	—	—		
Frequency of Offenses				14.2	1.56	.69
	No. of offenses/On-street years	.86	—	—		
	No. of offenses/Active years	.81	—	—		

[1] Derived from principal components analysis, orthogonal solution. e = Eigenvalue, a = Cronbach's alpha.
*% of Var. inclusive of one omitted variable.

the data reduction technique was to maximize orthogonality of the retained components at each of the four steps. Interpretation of the planned paths would be facilitated if an assumption of independence between predictors in the same subsets could be made. Since scale scores rather than factor scores were used in our analyses, it was important to determine whether orthogonality was maintained.

The correlation matrix for the path model variables (table 17–5) shows that there were moderate correlations between some variables within the same predictor sets. Obviously, such correlations contribute some spuriousness to the relationship between a given predictor variable and a criterion variable, and reduce the causal effect for predictors that correlate highly with other variables in the same set of predictors.

Path Analysis. For the entire sample of 125 subjects, a series of simultaneous multiple regression analyses was conducted. First, each of the four childhood/juvenile scales were entered as separate dependent variables with the three family/parental scales entered as predictors. Second, each of the five adult incompetence/pathology scales were entered separately as dependent variables with the three family/parental and four childhood/juvenile scales entered as predictors. Finally, the three adult criminal measures were entered as the dependent variables with the 12 family/parental, childhood/juvenile, and adult pathology/incompetence scales entered as predictors.

The sample was then broken down into two subsamples—rapists and child molesters, and the analyses described above were repeated for each of the separate, smaller groups. Separate analyses were justified on the basis of previous taxonomic research with this sample (Rosenberg,[4]; Schneider,[5]) that suggested stable, meaningful differences between these two groups in both offense behavior and general adaptation.

Six cases did not fit neatly into either the rapist or child molester categories as defined above and were excluded from these analyses. Some of these subjects had committed offenses against victims of varying ages, including both children and adult women, and a few others had exclusively assaulted adult males. While these subjects may have shown similarities to other offenders in the sample, it was felt that the unique factors in their offense histories rendered them qualitatively different from the other rapists and child molesters. Thus, 78 rapists and 41 child molesters comprised the subsamples for the second and third path analyses.

Table 17–5. Correlations Between All Item-Groups For Rapists and Child Molesters Combined (n = 125)

		FAMILY			CHILD/JUVENILE			
		INSTAB°	ABUSE	SEXDEV	ACTOUT	INCOMP	PSYCON	DESTRUC
FAMILY	INSTAB							
	ABUSE	.11						
	SEXDEV	.33	.07					
CHILD/ JUVENILE	ACTOUT	.32	.16	.11				
	INCOMP	.01	−.11	.07	−.14			
	PSYCON	.27	−.05	.00	.39	.06		
	DESTRUC	.11	.14	.22	.33	−.06	.22	
ADULT	ALCOHOL	.12	.12	−.06	.16	−.10	−.08	.13
	ACVOCIN	.21	−.03	.05	.18	.13	.37	.11
	INTERIN	.12	−.06	−.06	.21	.31	.30	−.07
	ANTISOC	.36	.20	.00	.51	−.09	.26	.26
	PSYSEX	.08	.00	.11	−.01	.42	.18	.16
CRIMINAL	SEXIMP	.16	.04	.03	.05	−.04	.03	.14
	DEGVIOL	.18	.05	.15	.20	−.17	.02	.13
	FREQ	.20	−.10	−.03	.31	−.22	.24	.10

*For full name equivalents of these abbreviations, refer to tables 17–1 to 17–4.

Results

Path Analysis for the Combined Sample

As can be seen in figure 17–1, family instability (child neglect, nonintact parental marriage, family instability) was the primary predictor within the family/parental pathology subset. A pattern of general family instability forecast acting out (.31) and psychiatric system contact (.31) in childhood/adolescence and antisocial behavior in adulthood (.25). (Unless otherwise indicated, all coefficients are betas (standardized regression coefficients.) Evidence of sexual deviation in the family bore only a weak relationship to destructiveness (arson, cruelty to animals, and vandalism) in childhood (.20). Substance and child physical abuse related to nothing in childhood or adulthood but was associated with a low frequency of criminal offenses (−.21).

ADULT					CRIMINAL		
ALCOHOL	ACVOCIN	INTERIN	ANTISOC	PSYSEX	SEXIMP	DEGVIOL	FREQ
.03							
.17	.36						
.31	.19						
.10	.07	.10	.14				
.22	.02	−.11	.10	.07			
.29	.10	−.04	.25	.00	.16		
.19	.33	.06	.44	−.12	.19	.12	

The strongest prodromal paths led from the child/juvenile period to adulthood. Acting out (an object-related delinquency pattern characterized by assaults on peers, nonsexual victim involved offenses, and drug abuse) was associated with antisocial behavior (.37) and interpersonal incompetence (.22) in adulthood. Psychiatric system contact (inpatient or outpatient mental health contact, running away) as a juvenile augured interpersonal (.22) and academic/vocational incompetence (.35) and a low incidence of alcohol abuse (−.20) in adulthood. Social and academic incompetence in adolescence foreshadowed interpersonal incompetence in adulthood. Notably, the strongest association found in this analysis was between adolescent social/academic incompetence and severe psychopathology/sexual pathology in adulthood (.41), while psychiatric system contact bore no antecedent relationship to severe psychopathology/sexual pathology. The last finding was a negative association between juvenile destructiveness and adult academic/vocational incompetence (−.24).

A salient feature of this analysis was the relatively poorer success at predicting criminal outcome than at predicting adult incompetence and psychopathology. Impulsivity in sexual offenses (.24) and degree of violence (.25) were predicted only by adult alcohol abuse. Note specifically that the R^2 values for impulsivity in sexual offenses (.11) and degree of violence (.18) were lower than all the R^2 values for the adult incompetence/pathology subsets except alcohol abuse.

Frequency of criminal offense was predicted by vocational incompetence (.27) and antisocial behavior (.35) (primarily unsocialized aggression and impulsivity in lifestyle) in adulthood and by a low incidence of parental substance abuse and child physical abuse ($-.21$). Severe psychiatric disturbance and sexual pathology in adulthood was not prognostic of any aspect of criminal offense.

Path Analysis for Rapists

The path analytic solution for rapists was reasonably similar to the combined model just presented (see figure 17–2). Family instability led to acting out (.30) and psychiatric system contact (.28) in childhood and to antisocial behavior in adulthood (.31). Family sexual deviation was strongly associated with destructiveness in childhood (.37). Social/academic incompetence in childhood again foreshadowed interpersonal incompetence (.30) and severe psychopathology/sexual pathology in adulthood (.43), while acting out was associated with adult antisocial behavior (.28). The association between childhood destructiveness and adulthood academic/vocational competence found in the analysis of the combined sample dropped out.

For the subsample of rapists, inpatient or outpatient mental health contact as a juvenile was prognostic only of frequency of criminal offenses (.34) and not of the global adulthood incompetence as observed in the combined model. Prediction of criminal offense for the rapists remained, for the most part, the same. Degree of violence was predicted only by adulthood alcohol abuse (.34). Frequency of offense was predicted by academic/vocational incompetence (.27) and antisocial behavior (.39), as well as psychiatric system contact in childhood (.34).

Path Analysis for Child Molesters

The path analytic solution for the subsample of child molesters differed in a number of ways from the combined sample (see figure 17–3). The
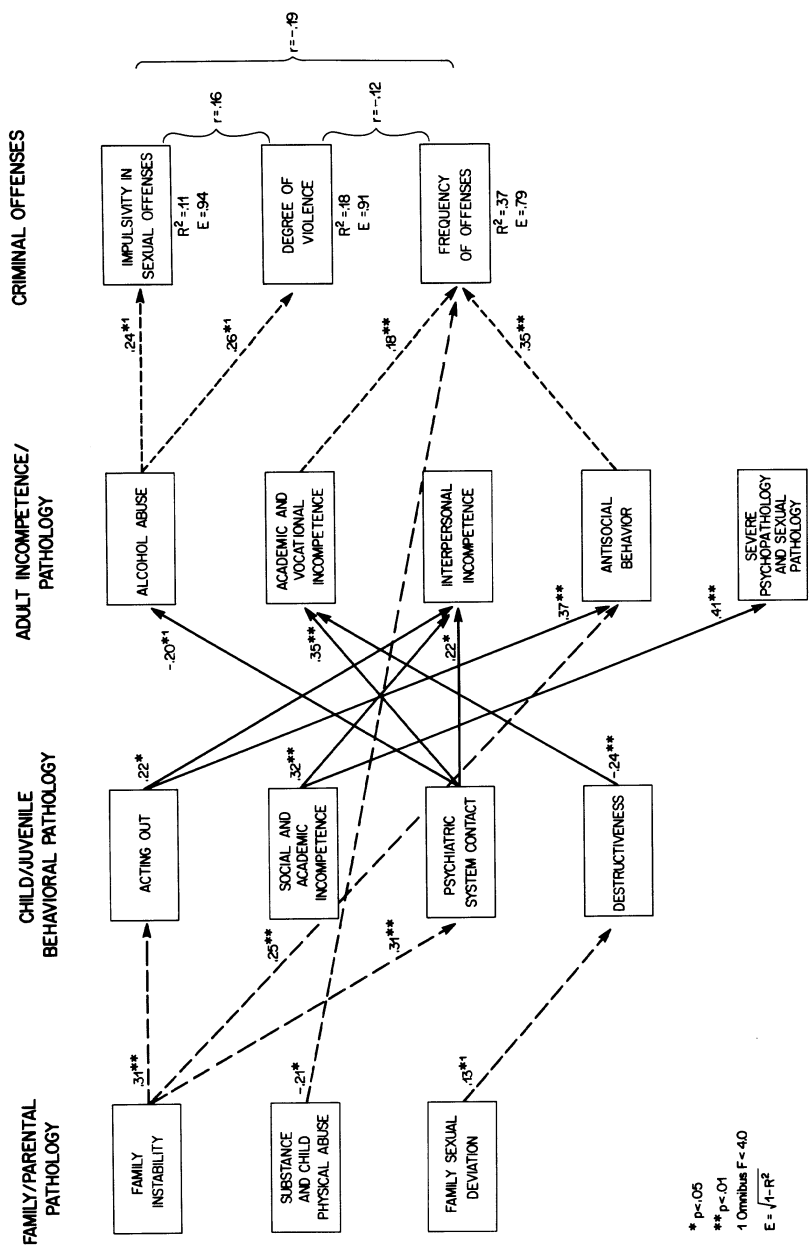
Figure 17-1. Linear Structural Analysis for Rapists and Child Molesters (simultaneous multiple regression analysis, n = 125)

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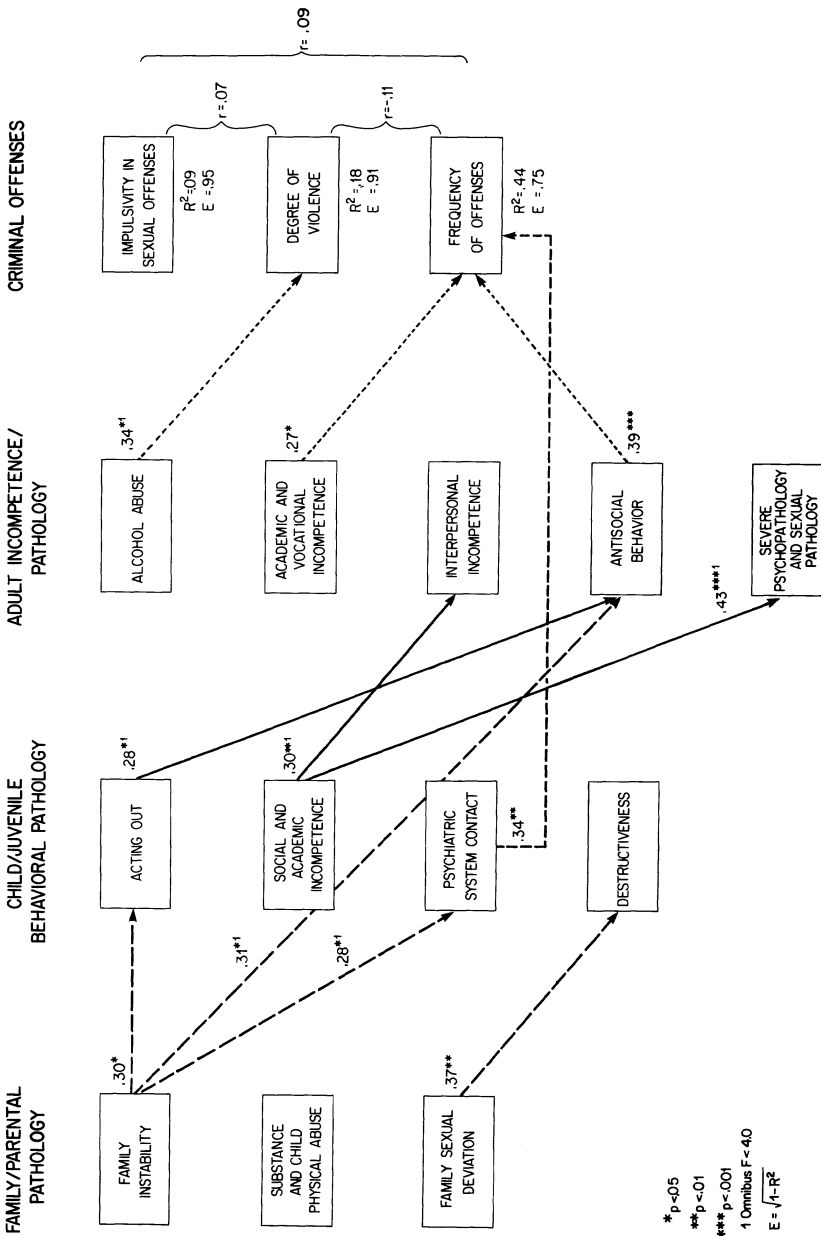
Figure 17–2. Linear Structural Analysis for Rapists (simultaneous multiple regression analysis, n = 78)
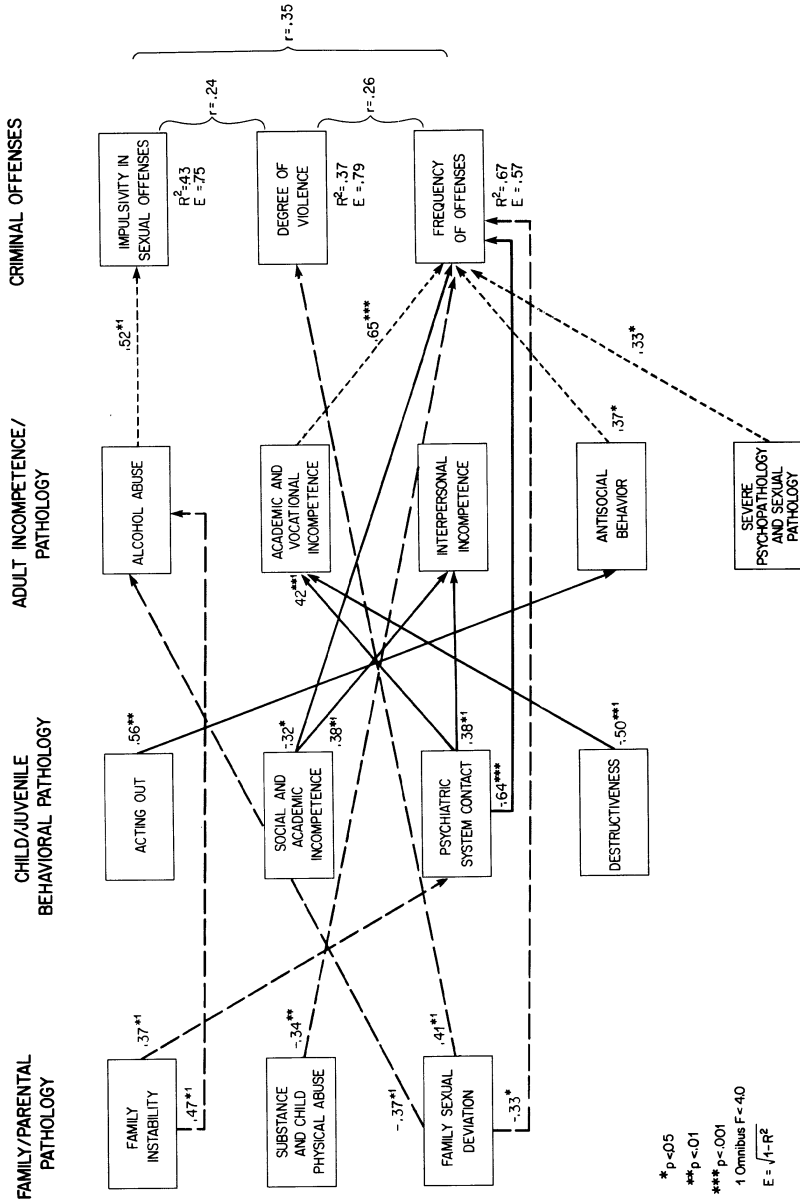
Figure 17–3. Linear Structural Analysis for Child Molesters (simultaneous multiple regression analysis, n = 41).

association between family instability and juvenile psychiatric system contact (.37) was the only prediction to childhood from family/parental pathology. In childhood, the paths from acting out to adult antisocial behavior (.56) and from social/academic incompetence to adult inter- personal incompetence (.38) remained while the paths from acting out to interpersonal incompetence and social/academic incompetence to severe psychiatric disturbance dropped out. Psychiatric system contact augured adult global incompetence (interpersonal: .38, academic/vocational: .42) but not alcohol abuse. Alcohol abuse was related, however, to family instability (.47). Notably, there was a strong negative association between juvenile destructiveness and adult academic/vocational incompetence (−.50).

The single most important and distinctive feature of this analysis was the network of paths leading to frequency of criminal offense. These longitudinal relationships were present in family/parental pathology (a low incidence of parental substance and child physical abuse (−.34)), sexual deviation in the family (−.33)), childhood and adolescence (a low incidence of social/ academic incompetence (−.32)) and psychiatric system contact (−.64)), and adulthood (academic/vocational incompetence (.65)), antisocial behavior (.37), and severe psychopathology/sexual pathology (.33)). Degree of violence in the criminal record was related only to family sexual deviation (.41), while impulsivity in sexual offenses was related only to alcohol abuse (.52).

Decomposition of Correlations among Variables

Within a given causal model it is possible to determine what part of a correlation between two variables is due to direct and indirect causation and what part is spurious. The remainder after subtracting the total direct and indirect effect from the magnitude of the zero-order correlation is spurious. In the combined path analysis of rapists and child molesters, the deviation of the summed direct and indirect causal effects from the zero-order correlations, averaged across all of the 83 *a priori* causal paths, was .055. Thus, only a relatively small portion of the covariation among those variables was not captured by the hypothesized causal model. A similar fit was observed when the causal model was applied separately to the rapist sample. Here the average deviation of the total causal effects from the zero-order correlations was .05. Nearly twice this level of deviation was found, however, for the child molesters, for whom the average noncausal or spurious effect was .098, suggesting that the causal amodel used was less appropriate for this subsample than for the rapists.

The patterns of multicollinearity within the individual temporal items sets varied somewhat across the three samples. In general, these intercorrelations were greater for the child molesters, contributing substantially to the larger noncausal effects found in this sample. Within each of the samples, greater spuriousness was evident when the child/juvenile and adult incompetence/ pathology variables were predictors than when the family/parental items served as predictors.

Space limitations do not permit a detailed description of the individual spurious effects in the rapist and child molester analyses. Table 17–6 presents those relations in each model with spurious effects $\geq$ .10 and either significant zero-order correlations or beta weights. The obviously larger spuriousness in the child molester model can be explained by a greater multicollinearity within the item sets for this subgroup. A larger sample of child molesters is required to allow independent principal components analyses for this subgroup. Such analyses will be done in our forthcoming work on this population.

Discussion

Implications of the Data Reduction Phase

The principal component analyses that yielded the predictor and criterion subsets of variables were performed on data collected on the entire sample. It is clear that some of the item groups that emerged, however, fit into the predictive model in very different ways for the rapist and child molester subsamples, and it may be the case that some of these differences are due in part to differences in the meaning of the variables for the two subsamples.

Many of the assessments (e.g., of childhood neglect, family instability, alcohol abuse, etc.) were global and multidimensional and allowed for considerable variation in meaning of a 'high' or 'presence' score. Additionally, some of the input variables occurred with differential frequency in the rapist and child molester subsamples. This point is important to keep in mind in interpreting subsample path findings, since such variations in item frequency could produce similar scale scores for each subsample with somewhat different meanings.

Other points regarding the results of the principal component analyses may also facilitate interpretation. In the first subset of variables (family/parental pathology), the data suggested that child neglect and child physical abuse reflect distinct phenomena. These results are consistent with previous

Table 17–6. Decomposition of Zero-Order Correlations*

Relations	r	Direct	Indirect	Spurious**
			Effects	
Rapist Model				
Family SEXDEV to Juvenile ACTOUT	.251	.146	—	.105
Juvenile ACTOUT to Criminal FREQ	.320	.032	.127	.161
Child Molester Model				
Family INSTAB to Adult ALCOHOL	.234	.467	−.122	−.111
Family SEXDEV to Adult ALCOHOL	−.168	−.365	.057	.140
Family SEXDEV to Criminal FREQ	−.262	−.333	−.060	.131
Juvenile PSYCON to Adult ANTISOC	.333	.120	—	.213
Juvenile PSYCON to Criminal FREQ	.020	−.645	.469	.196
Juvenile DESTRUC to Adult ANTISOC	.420	.025	—	.395
Adult ALCOHOL to Criminal FREQ	.341	−.099	—	.440
Adult ACVOCIN to Criminal FREQ	.356	.649	—	−.293
Adult ANTISOC to Criminal DEGVIOL	.358 .	.038	—	.320
Adult PSYSEX to Criminal FREQ	.194	.325	—	−.131

*For which r or beta (direct effect) significant ($p < .05$).
**≥ 1.0.

conceptualizations (e.g., Burgess and Conger, 1978). The distinctiveness of the phenomena they represent is further validated by the different roles these variables played in the path analyses.

Similarly, in the childhood/juvenile behavior pathology set, principal component analysis suggested two distinct constructs of delinquent behavior. One, labelled acting out, was defined by a range of behaviors including drug abuse, nonsexual victim involved offenses, running away, assaults on peers,

assaults on teachers, vandalism, and truancy. The other, labelled destructive-ness, was more narrowly defined by arson, cruelty to animals, and vandalism. The distinctiveness of these dimensions was also validated by the different roles these constructs played in the path analyses. For the combined sample, acting out was predicted by family instability, while destructiveness was predicted by family sexual deviation. Interestingly, both of these paths dropped out for the subsample of child molesters. In fact, what emerged was a strong relation between family sexual deviation and destructiveness for rapists only. Synthesis of these results suggests that family instability and family sexual deviation have qualitatively different effects on style of juvenile aggression and qualitatively different consequences for rapists and child molesters.

Noteworthy also is the similarity of the destructiveness construct to the 'triad' of enuresis, arson, and cruelty to animals hypothesized to covary with psychopathic behavior (e.g., Hellman and Blackman, 1966). In our analyses enuresis did not load with any other variable and the destructiveness construct was not a powerful predictor. If indeed the destructiveness in these analyses is analogous to the triad, its lack of predictive validity is notable. It did not predict anything for rapists and only predicted academic and vocational incompetence for child molesters.

One other item group in the child/juvenile behavior pathology set, psychiatric system contact, deserves mention. This item group, composed of psychiatric institutionalization, outpatient mental health contact, and running away, appeared at least in part to measure the response of social service systems to familial pathology or instability, rather than merely the degree of psychopathology evidenced by a subject. This interpretation is made not only on the basis of the input variables defining this construct, but also on the basis of the way this construct related to other variables. The construct appears to reflect both social service system and subject characteristics.

The failure to find a relation, in any of the analyses, between juvenile academic/social incompetence and adult academic/vocational incompetence is not surprising in light of the different items that comprised these similarly named constructs. The juvenile component included various indicators of poor functioning and adaptations (i.e., learning disabilities, poor school achievement, late maturing, and social isolation in the absence of substance abuse), whereas the principal component analysis of the adult items yielded two separate and more highly specific constructs for academic/vocational and interpersonal incompetence. The different nature and significance of the adult incompetence measures is further illuminated by examination of their different childhood antecedents. On the one hand, adult interpersonal incompetence was consistently predicted in all analyses by juvenile

academic/social incompetence, attesting to the longitudinal stability of social incompetence. On the other hand, adult academic/vocational incompetence was predicted in the analyses of the combined sample and of the child molesters by juvenile psychiatric system contact, which most likely reflects the inhibiting effects of lengthy institutionalizations on subsequent educational and occupational achievement.

Two components within the criminal offenses set—impulsivity in sexual offenses and frequency of offenses—also require some explication. Impulsivity in sexual offenses refers specifically to the degree of planning evidenced in committed sexual offenses. Frequency of offenses is an index of repetitiveness that may or may not relate to a more global characteristic of impulsiveness. These differences are clearer when the paths are examined and it can be seen that different antecedents predicted each variable.

Additionally, frequency of offenses is somewhat confounded. As the variable exists, it includes all sexual and nonsexual offenses, with no control for type of offense or for the fact that some offenses tend to have higher base rates than other kinds of offenses. Additionally, interpretation of this variable is difficult because of the inconsistent way offenders may be charged for committed offenses. For example, a child molester who maintained a relationship with one victim over a period of time may have been charged with one offense despite multiple sexual contacts, whereas an offender who had fewer contacts but with more than one victim may have been charged with more offenses. This variable is therefore not a pure index of the number of specific illegal acts over a given time period.

Prediction of Childhood and Adult Adaptation and Criminality

In the introduction we noted a number of family characteristics that have been found to covary with youthful aggression and delinquency and to predict general criminality. As we have indicated, the majority of these variables either loaded directly on or were implied in the family instability component (which included nonintact family marriage, instability, and child neglect, and implied marital disharmony, lax discipline, poor supervision, and possibly rejection). Severe punishment and physical cruelty loaded on our second component, and sexual abuse on our third component. Each of these latter two components accounted for substantially less variance than the first. As one would expect, family instability as derived from component one was the most predictive of subsequent maladaptation, foreshadowing juvenile acting out and adult antisocial behavior, and general adult

incompetence via juvenile psychiatric system contact. The physical abuse factor was a much weaker predictor across all three analyses, even though in this sample such abuse had exactly the same documented frequency (57%) as child neglect. This might at first appear inconsistent with some findings (e.g., Reidy et al., 1980) that neglected children experience adaptation problems that are intermediate between those of normal and physically abused children. It is important to note, however, that family instability included parental conflict and instability in addition to neglect, and thus seems to represent a more serious constellation of variables than the notion of neglect as typically understood in the child abuse literature.

The family sexual deviation component was included because of its possible predisposing role in child molesting (Brant and Tisza, 1977; Seghorn and Boucher[3]) and found to predict later adaptation only in the child molester analysis. Among child molesters it was related to both greater violence in their sexual crimes and to a lower frequency of crimes. This suggests that it predicts a more aggressive type of child molesting, in which the offender fails to establish a relationship with the victim outside of that necessary for attaining sexual gratification. Such an offender tends to molest children whom he does not know and to use more force in achieving his aims (Cohen and Boucher[2]). It should be mentioned that this interpretation is not without its problems, the main one being the multiple confounds previously discussed in the frequency of offense component. This interpretive problem will be elaborated below in our discussion of the types of child molesters evident in the causal model.

Two important aspects of the prediction from childhood to adult variables showed substantial similarities to the results of other studies conducted on vastly different subject populations. First, the predictions in all three path analyses from juvenile acting out to adult antisocial behavior and frequency of offenses confirm previous findings of the longitudinal stability of aggressive behavior (Olweus, 1979). The stability of aggression found in the present sample attests to the impressive robustness of such behavior, particularly since this sample was selected because of adult sexual assaults, and thus should have been more homogeneous with respect to aggression than previous samples. Yet, the longitudinal stability of aggression is manifestly evident. Second, in the analyses of the entire sample and of the rapists alone, social and academic incompetence predicted severe adult psychopathology. A similar relation of childhood social and academic variables to adult psychiatric symptoms has been found in studies of preschizophrenics (Knight and Roff, 1983; Prentky, Lewine, Watt and Fryer, 1980). Moreover, the pattern of childhood aggression predicting adult criminality, and learning problems foreshadowing psychiatric problems, is

strikingly similar to the pattern of results reported by Ensminger, Kellam and Rubin (1983) in their study of black ghetto youths. Clearly, the consistency of results for aggression and social and academic incompetence across such disparate samples strongly supports the general predictive power of these variables.

The attempt of the present study to account for specific aspects of criminal activity met the same fate as much of the previous criminality research literature. The prediction of the frequency of crimes was far superior to the prediction of either the amount of violence or the impulsivity (planning) of individual sexual crimes. The problems of predicting violence have perennially plagued researchers (Monahan, 1981). Even the recent studies implicating genetic factors (Gabrielli and Mednick, 1983) have had more success predicting frequency than violence. In the present study only alcohol abuse was consistently related to either violence or impulsivity across the three path analyses, covarying with violence for the rapists and impulsivity for the child molesters. Interestingly, of the five adult incompetence/psychopathology scales, alcohol abuse was most poorly predicted by antecedents ($R^2 = .10$). Thus, the constellation of alcohol abuse, violence, and impulsivity in the sexual offenses is only weakly associated to the variables in the model, and additional antecedents should be sought to account for these variables.

The link of alcohol abuse to violence for rapists and impulsivity for child molesters confirms Rada's (1975, 1976) hypothesis of the importance of alcohol in sexual offenses and suggests avenues of future research. The link between alcohol use and the amount of violence in the crime is especially intriguing, since in our principal component analysis of the family variables, child physical abuse and parental alcoholism loaded on the same component. Thus, alcohol and violence covaried twice in our data. This supports the relation of alcohol to violence that has been found in studies of general criminality (Goodwin, 1973; Guze, Tuason, Gatfield, Stewart and Picken, 1962; Nicol, Gunn, Gristwood, Foggitt and Watson, 1973; Shupe, 1954; Virkkunen, 1974; Wolfgang and Strohm, 1956). Alcohol's contribution to the prediction of sexual offense impulsivity for child molesters suggests that alcohol might relate in a complex manner to criminality and that more careful specification of its role for subtypes within the general criminal population would be useful.

The model that we have presented relies on stable subject characteristics as the mediators of earlier life history events in predicting specific aspects of criminal behavior. Such a model is clearly incomplete. For a more adequate prediction of aggressive behavior, in addition to the assessment of the individual's substance abuse, academic, vocational, and social incompe-

tence, strength of habitual aggressive tendencies, and general level of serious psychopathology, we would have to take into account situational and person-situation interactive variables (Olweus, 1969, 1973). Given our inability to measure such variables and given the problems inherent in our reliance on the inevitably partial accounts in archival data, the predictions we obtained, particularly to adulthood pathology, were impressive. The many consistencies between our sample of sexual offenders and other delinquent and criminal populations support the notion that some variables operate in a similar fashion across these samples. A more precise determination of how similar sexual offenders are to the general criminal population requires a more careful examination of the subsample analyses.

Assessment of Differences between Rapists and Child Molesters

The linear structural model for rapists was characterized by two major paths both emerging from family instability. One path proceeded from family instability to juvenile acting out, adult antisocial behavior and frequency of criminal offenses. The other path led from family instability to juvenile psychiatric system contact and frequency of criminal offenses. Thus, there appear to be two independent routes to more frequent criminal offenses for this sample of rapists, both originating with family instability, but manifesting that instability differently during the child/juvenile period. One path appears to define a longitudinal pattern of assaultiveness and generic (nonsexual) unsocialized aggression, while the other path is defined entirely by an antecedent history of early psychiatric institutionalization or psychiatric outpatient contact with no indication of explicit antisocial behavior. Thus, there is direct evidence for at least two types of rapist in this model. One might be described as an impulsive, antisocial character disorder, while the other might be described as a low impulse, incompetent individual with no evidence of early conduct disorder. An obverse type, while not directly observed in the model, may be inferred from the pattern of correlations. This type of rapist is characterized by no apparent history of family instability, few childhood or juvenile problems, and a low frequency of criminal offenses. These three "types" bear close resemblance to three rapist subtypes described elsewhere (Prentky, Cohen, Seghorn, Garofalo and Boucher)[6].

The linear structural model for child molesters was more complex. To simplify the interpretation of these results, we will discuss only those paths that were characterized by a close congruence between the zero-order correlations and the beta coefficients. At least three major paths were

evident. The first path emerged from family sexual deviation and led directly to criminal offense scales. The presence of family sexual deviation boded low frequency of offenses, but a high degree of violence, as well as a low incidence of alcohol abuse. It would appear that the aim of an individual described by this pattern might be primarily aggressive and exploitative, reflecting a type noted earlier in this discussion. The second path emerged from family instability and led to juvenile psychiatric system contact, interpersonal and academic/vocational incompetence in adulthood and frequency of criminal offenses. This path suggests a child molester with a history of global incompetence who resembles the instrumentally aggressive, fixated child molester described elsewhere (Prentky et al.).[6] Another path that proceeded from family instability to alcohol abuse and impulsivity in sexual offenses seems to be independent of this incompetent type. The third path began with childhood acting out and led to adult antisocial behavior and higher frequency of criminal offenses. This individual would be the child molester equivalent of the rapist described as an impulsive, antisocial character disorder.

There are a number of salient differences between the results observed for the rapists and child molesters in this sample that should be highlighted. First, while our data support the critical role of family dynamics in the etiology of sexual offenses, the predictive impact of family and parental variables we have assessed differed for the two groups. The effect of family instability and family sexual deviation manifested itself in childhood for the rapists. For child molesters it did not differentially predict until adulthood, with the important single exception being the child molester with a history of global incompetence. The immediate impact of severe family pathology on childhood acting out and destructiveness, observed primarily in the sub-sample of rapists, resembles the patterns observed in prospective studies of delinquent youths.

Second, juvenile acting out was more prevalent in rapists than child molesters ($t = 2.76$, $p < .01$) but was somewhat more predictive of adult aggression and frequency of crimes for child molesters. Alternatively, childhood social and academic incompetence was more characteristic of child molesters ($t = 4.35$, $p < .001$), but predicted severe adult psychopathology for rapists only. Thus, presence in one subsample of behavior more predominant in the other was a distinguishing risk factor. It is interesting to note, in this regard, that these "atypical" patterns had developmental courses differing from patterns more characteristic of the corresponding subsample. For the rapists, the path leading from childhood social incompetence to adult psychopathology was independent of the more characteristic paths leading from delinquency to frequency of offenses and

from early psychiatric contact to frequency of offenses. For the child molesters, the path leading from juvenile acting out to adult antisocial behavior was not moderated by the childhood and adult incompetence scales that were important components of other paths in the model.

Third, the two subsamples clearly differed with respect to the antecedents of the frequency of their offenses. A particular problem with the frequency of offenses scale for the child molesters makes it difficult to interpret the differences in patterns of prediction found in the rapist and child molester subsamples. As discussed above, this scale was confounded for child molesters because of the inconsistency with which charges are preferred within the criminal justice system, distorting the actual frequency of sexual offenses for some of the child molesters. Sorting out this confound would certainly clarify the relation of the multiple antecedent variables to actual frequency. Additionally, a partitioning into sexual and nonsexual offenses may result in differential prediction to each kind of offense. Such information would be valuable, particularly in delineating subtypes of offenders within each of the child molester and rapist subsamples. For the rapists the pattern of prediction of more frequent offenses may be interpreted as reflecting such factors as an impulsive lifestyle and a difficulty in establishing adequate vocational competence and stability. The interpretation of the complex pattern of predictors for the child molesters must await clarification of the confounds described.

In general, interpretation of or comparisons with the child molester model must be viewed with caution until subsequent analyses on a larger sample are completed. The size of the present sample was much too small for the number of variables entered, producing considerable risk of Type I error. Additionally, adoption of a path analytic strategy for this investigation precluded a selective step-wise entry of predictor variables. The size of each subsample also precluded independent principal component analyses. Such independent analyses may have substantially reduced the multicollinearity in the child molester model.

In conclusion, given that this was an exploratory investigation, it is striking that the beta values were as congruent with the zero-order correlations as they were in the rapist model. Obviously, the foregoing statements contrasting the rapists with the child molesters cannot capture the extraordinary diversity and complexity of this heterogeneous population. Current research at the Massachusetts Treatment Center involving the application of a detailed taxonomic system to the entire sex offender population (approximately 180) will hopefully produce an increased resolution that will enable us to identify more subtle nuances differentiating subgroups of rapists and child molesters.

Acknowledgments

Notes

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III. NONCRIMINAL AGGRESSIVE BEHAVIOR

18 EARLY LIFE EXPERIENCES THAT RELATE TO LATER AGGRESSION BY WOMEN

Tore Hällström

Introduction

Several studies have shown that children's behavior is related to parental behavior patterns. Much of this research has focused on prediction from aggressive and hostile childrearing practices, or the parent-child relationships, to aggressiveness in children (Becker et al. 1962, Kagan and Moss 1962, Eron et al. 1963).

The consequences later in life on the parental childrearing attitudes or practices are not so well known. Kagan and Moss (1962) in their prospective study, found that early aggressivity in girls neither predicted adult aggressivity nor competitiveness. Maternal hostility toward girls during the first three years predicted independence from love objects and a reluctance to withdraw from stress during adult years. The prospective study by Eron et al. (1974) showed, however, that for both sexes peer rated aggressivity at age 8 correlated rather highly with peer rated aggressivity at age 18.

There are few systematic studies, however, on the relationship between early experiences and aggression as a relatively enduring feature of personality. The main purpose of this study is to investigate relations existing

between aggression in women around 40–50 years of age and perceived emotional dynamics during childhood.

Study Population

A population sample of middle aged women was randomly selected from the general population of women in Göteborg, Sweden. The sample was obtained from the Revenue Office Register and invited to a comprehensive health investigation. A representative subsample of women in the four age strata 38, 46, 50 and 54 years was selected for psychiatric examination. A total of 800 women participated in this, corresponding to a participation rate of 89.0%. There were slightly more single women among the non-participants. There were, however, no significant differences between the participants and nonparticipants concerning psychiatric illness or socio-economic status. Further details of the method of sampling etc. have been given elsewhere (Hällström 1973, Bengtsson et al. 1973).

Methods

The psychiatric investigation comprised a semistructured interview lasting 1–2 hours and the completion of a number of questionnaires. During the interview the author systematically assessed information about childhood experiences and behavior, symptoms of psychiatric illness, and present social situation. Only parts of the available information are utilized for this presentation. A fuller description of the methods are presented by Hällström (1973) and Hällström and Samuelsson (1981). The following variables were rated.

Aggression

The aggression scale of the Cesarec-Marke Personality Schedule (CMPS) was used as an instrument for assessing aggression (Cesarec and Marke 1968). It consists of 15 questions about impulsive aggression, the need to revenge an injury, and irritability. The questions are to be answered "yes" or "no" and they are linguistically balanced to counteract an acquiescent response style. The aggression score thus can very between zero and 15. Owing to technical problems during the first two months of investigation, 173

subjects did not undergo CMPS. Of the remaining women it was not possible to apply CMPS in 38 cases (6.1%) owing to language difficulties, severe psychiatric illness or mental retardation.

High aggression was defined as the upper quintile of aggression scores. The cutoff point between score six and seven separated out 113 subjects (19.2%) as high aggressives (figure 18–1).

Climacteric Phase

The women were divided in four groups according to menstrual status: The premenopausal group has regular menstruations, and the perimenopausal group has periods of amenorrhoea lasting for less than 12 months. The postmenopausal women were divided into an early group, in which the menopause occurred less than three years ago, and a late group. This variable was not rated for those women who had undergone bilateral oophorectomy, X ray castration or hysterectomy, and the very few who were taking contraceptive pills.

Early Experiences and Behavior

Broken home before six (yes, no). Broken home before 17 (yes, no). Father's social class-occupational status (1, 2, 3, 4). Poverty during childhood (yes, no). Quarrels between parents (never, seldom, sometimes, often). Physical punishment (never, seldom, sometimes, often). Good emotional contact with mother (yes, no). Good emotional contact with father (yes, no). Having been misunderstood in childhood (yes, no). Harsh parental attitude (yes, no). Happy childhood (yes, no). Relations with siblings (good on the whole, not so good). Relational problems at school (yes, no). Educational achievement (yes: above primary school or more than one year of vocational training. No: other responses). Early behavioral disturbances (yes: two or more of the following 12 symptoms; stammering, bedwetting, tics, intense fear of the dark, sleep disturbance, nailbiting, "delicate health", hypersensitivity, period in convalescent home, difficulties in upbringing, truancy, running away from home during childhood. No: no or one of the symptoms). Father mentally ill (no, probable, contact with doctor, warded). Father alcoholic addiction (yes, no). Mother mentally ill (no, probable, contact with doctor, warded). Any of the parents mentally ill (yes: Any parent having had contact with doctor or warded. No: other responses).
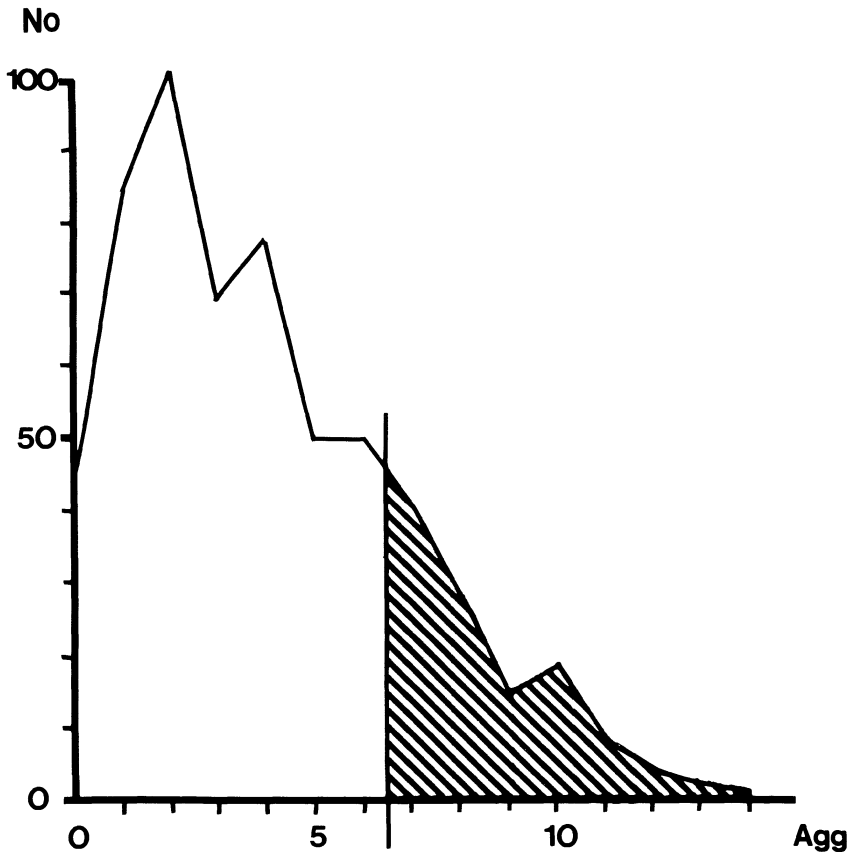
Figure 18-1. Total Sample: Aggression Score Distribution

Psychiatric Illness and Psychophysiologic Symptoms

Current psychiatric illness, disability grade (none = 0, border = 1, mild = 2, moderate = 3, severe = 4). Psychiatric illness during life, maximum disability grade (none = 0, border = 1, mild = 2, moderate = 3, severe = 4). Current depressive disorder, global rating (none = 0, border = 1, mild = 2, moderate = 3, severe = 4). Current depressive disorder, Hamilton Rating Scale (Hamilton 1967) (all subjects with zero ratings on the first three items—depressive mood, guilt feelings and suicidal thoughts—were assigned

a zero total score). Suicidal ideation and behavior during life, maximum grade (no suicidality = 0, life-weariness = 1, suicidal thoughts = 2, self-destructive act without definite suicidal wish = 3, seriously intended suicidal attempt = 4). Phobia grade (none = 0, border = 1, mild = 2, moderate = 3). Frequency of panic attacks (less than once/month = 0, ≥ once/month = 1, ≥ once/week = 2, daily = 3). Frequency of current psychotropic medication (none = 0, up to once/month = 1, up to once/week = 2, more than once/week = 3, daily = 4). Bodily tension (yes, no). Restlessness (yes, no). Sleep disturbance (0, 1, 2). Tiredness (no. of symptoms: 0–11). Chest pains (yes, no). Headache (less often than once/month = 0, ≥ once/month = 1, ≥ once/week = 2, daily = 3). Bodily aches/pain (yes, no). Low back pain (yes, no).

Present Social Situation

Own occupational status—current or previous (1, 2, 3, 4, nil). Social class—husband's occupational status primarily (1, 2, 3, 4). Job involvement (none = 0, part-time = 1, full-time = 2). Good adaptation to job situation (yes, no). Marital status (unmarried, married, divorced, widow). Cohabitating with a man (yes, no). Changes in quality of marriage (positive, no change, negative). Number of children born. Sexual desire (strong, moderate, week, absent). Coital frequency (no./year). Orgasmic capacity—coital (always, usually, sometimes, never). Contacts outside own family (less than once/month = 0, ≥ once/month = 1, ≥ once/week = 2, daily = 3). Number of psychosocial stressors last year (presence of the following ten stressors was assessed: serious physical illness in husband, husband mentally ill, husband alcoholic, problems with husband's work, marriage disrupted by separation, divorce or husband's death, serious problems with children, last child had left home, parent died or seriously ill, problems with own work, and moved to another home).

Statistical Methods

Pitman's nonparametric permutation test (Bradley 1968) was used to test the hypotheses (1) of no differences in the variables studied between the high aggression quintile and the rest of the sample, when the confounding variables (age and social class when not otherwise stated) were kept constant, or (2) of no correlations between aggression and the variables studied, when a series of confounding variables were kept constant. In these

analyses subgroups were formed for the confounding variables and the association between the factor and aggression was tested in each subgroup. The results from the subgroups were pooled using a technique described by Mantel (1963). In some cases a X^2 $-$ test was used. The associations were considered statistically significant for values of $p < 0.05$ (two-tailed test).

Results

High Aggression in Relation to Age and Climacteric Phase

The subjects belonging to the most aggressive quintile were significantly ($X^2 = 9.77$, df $= 3$, $p < 0.05$) more often found in the youngest group (figure 18–2). As the youngest was somewhat better educated the relation between aggression and age was tested with adjustment for educational achievement. Still the trend was significant ($p < 0.05$). No significant difference emerged (neither with X^2-test nor with Pitman's test with allowance for age and social class) between the climacteric phase groups in the proportion of aggressive subjects (figure 18–3).

High Aggression in Relation to Early Experiences and Behavior

The most aggressive quintile of the subjects was compared with the rest of the sample for each of the variables concerning early experiences and behavior. Adjustments for age and social class were made. The high aggressive quintile of the women more often reported quarrels between parents ($p < 0.001$), physical punishment ($p < 0.001$), feelings of having been misunderstood ($p < 0.00001$), and they less often perceived good emotional contact with mother ($p < 0.001$), good emotional contact with father ($p < 0.05$), or a happy childhood ($p < 0.01$). The aggressive group also reported that they more often had had early behavioral disturbances ($p < 0.001$) and better educational achievement ($p < 0.01$; adjusted for age only. The same p-value is reached when adjustment is made for age and father's social class). Figures 18–4–18–6 and tables 18–1–18–5 show the proportion of high-aggressive subjects (the aggressive quintile of the total sample) in different groups. Tables 18–1–18–5 show the results of overall X^2-testing.

The following variables did not show any significant differences between the two groups under comparison: Father's social class-occupational status (adjusted for age only) (figure 18–7), poverty during childhood (adjusted for age only), harsh parental attitude, conflicts with siblings, father mentally ill,
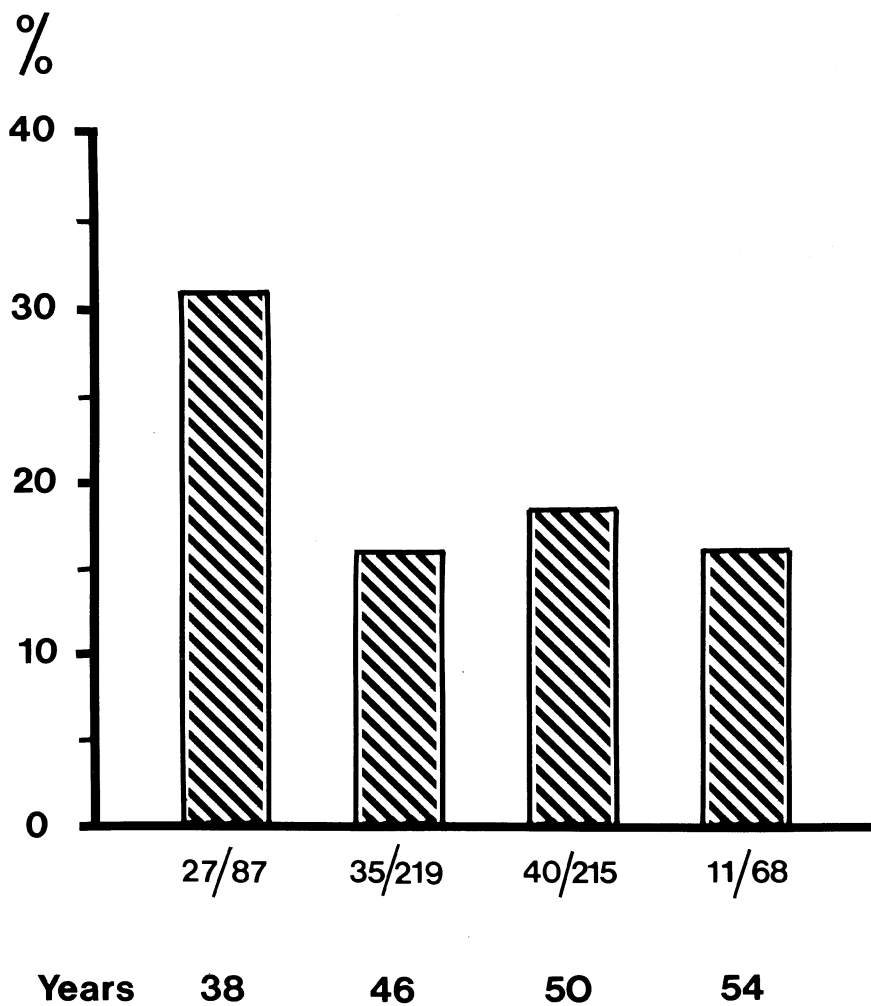
Figure 18–2. High Aggression Rate (%) by Age
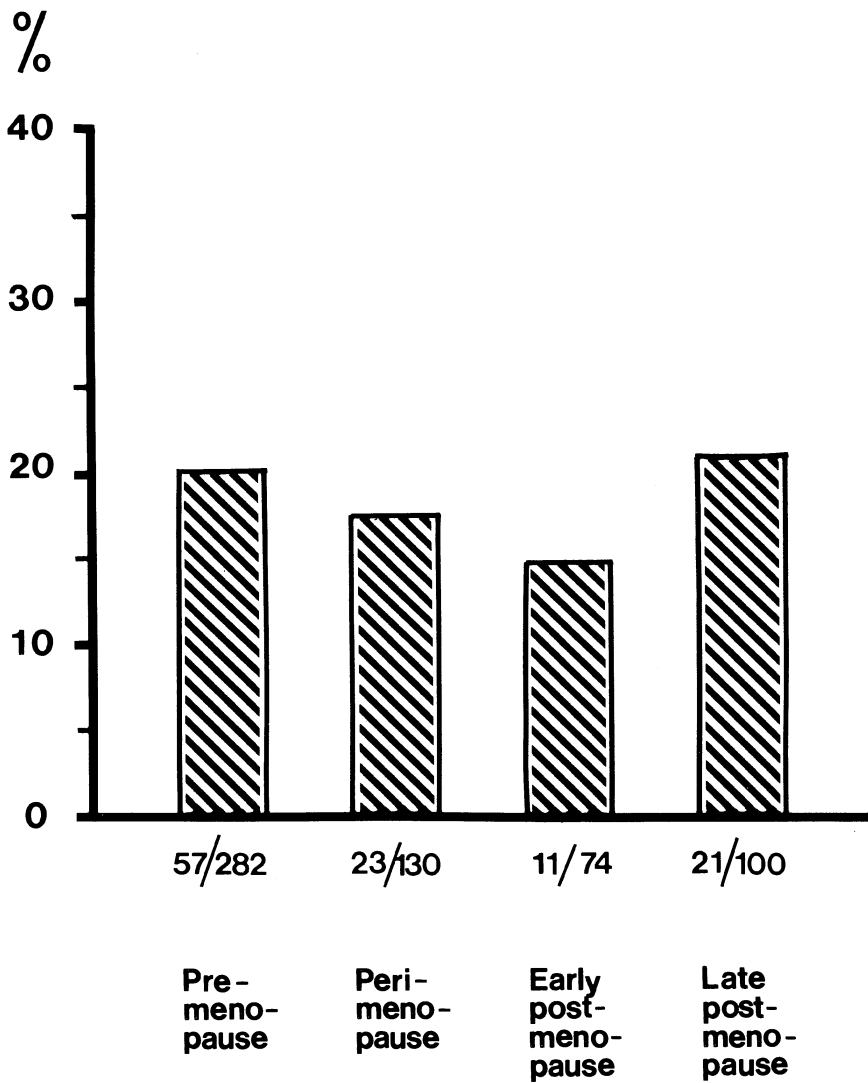
Figure 18–3. High Aggression Rate (%) by Climacteric Phase
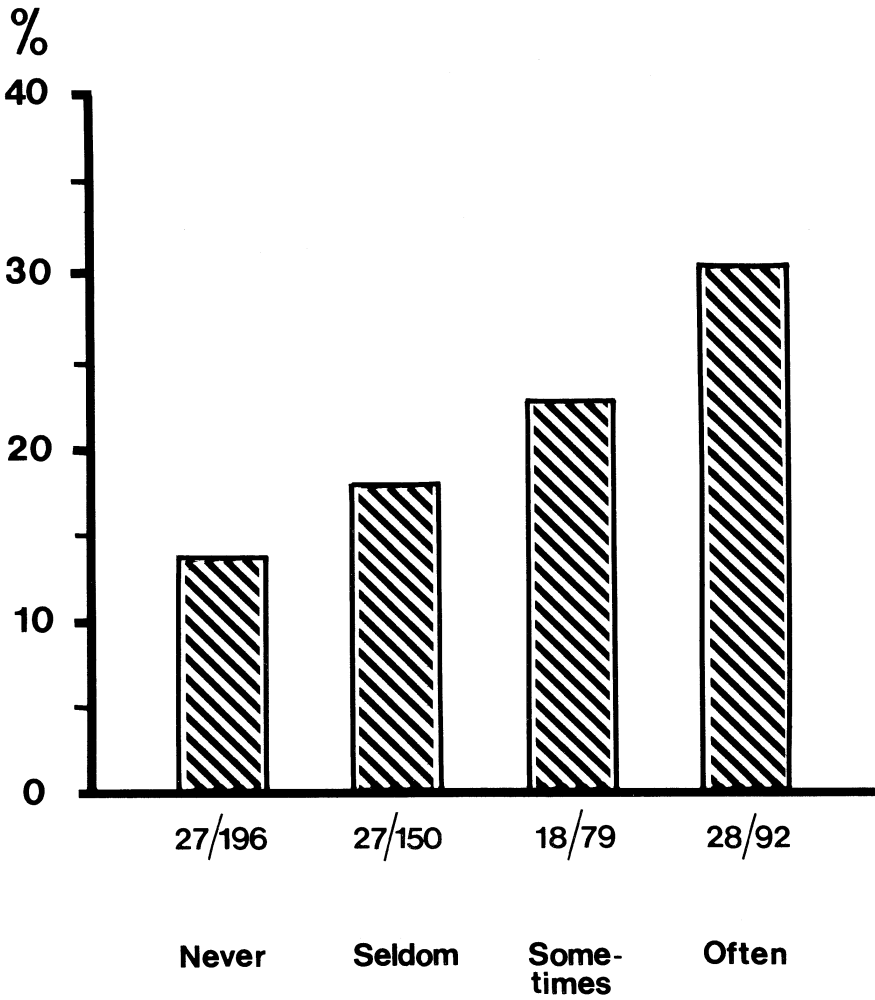
Figure 18–4. High Aggression Rate (%) by Quarrels Between Parents
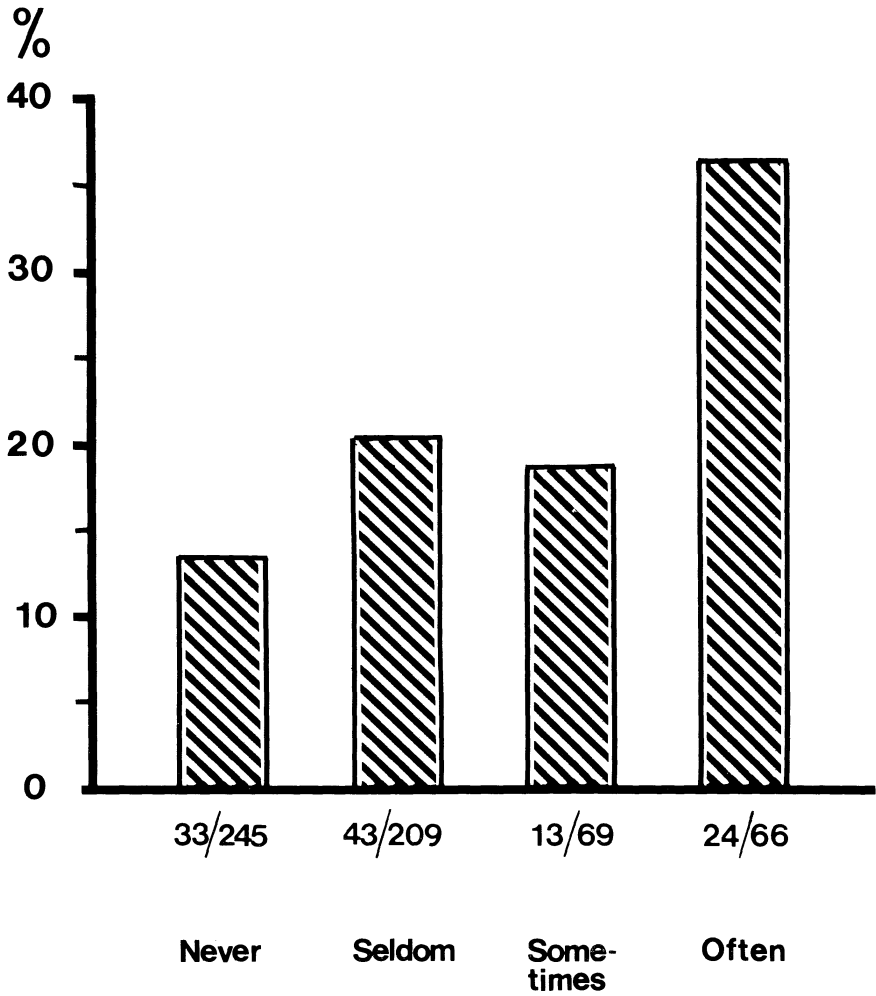
Figure 18–5. High Aggression Rate (%) by Physical Punishment
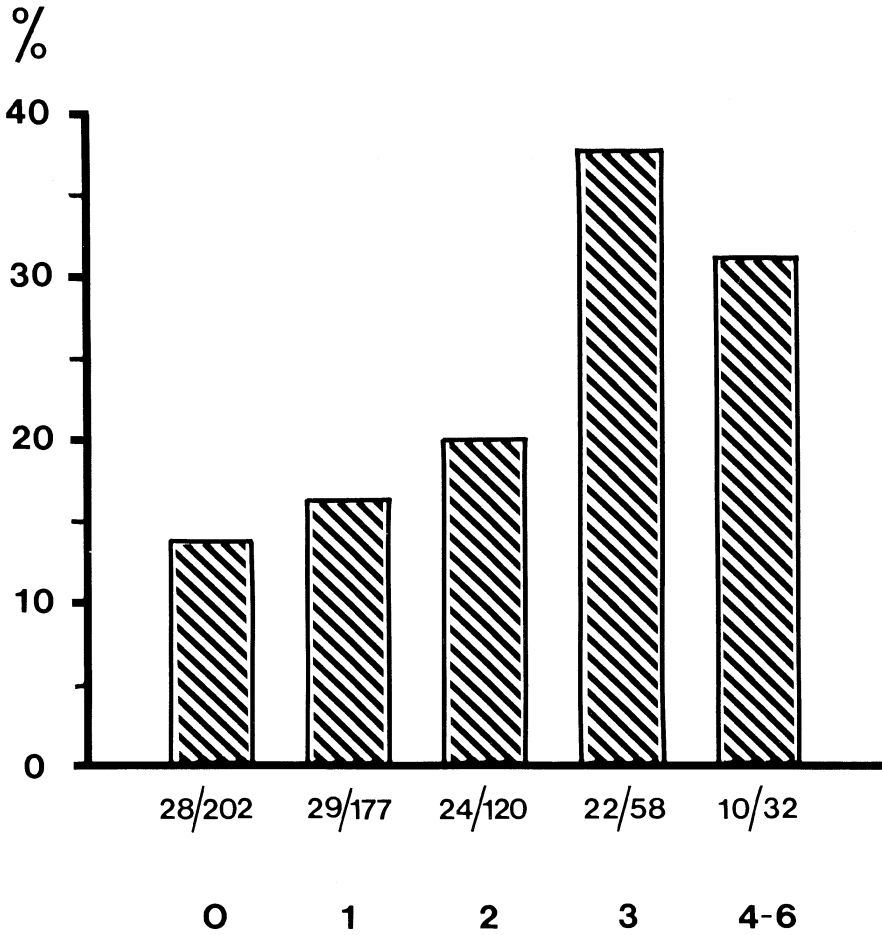
Figure 18–6. High Aggression Rate (%) by Early Behavioral Disturbances (Number of Symptoms)

Table 18-1. High Aggression in Relation to Having Been Misunderstood

	Aggression		
Having Been Misunderstood	Low	High	Total
No	307	39	346
	(88.7)	(11.3)	(100)
Yes	164	74	238
	(68.9)	(31.1)	(100)
Total	471	113	584
	(80.7)	(19.3)	(100)

$X^2(df = 1) = 34.24$; $p < 0.001$

Table 18-2. High Aggression in Relation to Emotional Contact with Mother

	Aggression		
Good Contact with Mother	Low	High	Total
Yes	284	45	329
	(86.3)	(13.7)	(100)
No	161	61	222
	(72.5)	(27.5)	(100)
Total	445	106	551
	(80.8)	(19.2)	(100)

$X^2(df = 1) = 15.37$; $p < 0.001$.

Table 18–3. High Aggression in Relation to Emotional Contact with Father

	Aggression		
Good Contact with Father	Low	High	Total
Yes	187 (84.6)	34 (15.4)	221 (100)
No	227 (76.4)	70 (23.6)	297 (100)
Total	414 (79.9)	104 (20.1)	518 (100)

$X^2(df = 1) = 4.79$; $p < 0.05$.

Table 18–4. High Aggression in Relation to Happy Childhood

	Aggression		
Happy Childhood	Low	High	Total
Yes	374 (84.6)	68 (15.4)	442 (100)
No	66 (71.0)	27 (29.0)	93 (100)
Total	440 (82.2)	95 (17.8)	535 (100)

$X^2(df = 1) = 8.89$; $p < 0.01$.

Table 18–5. High Aggression in Relation to Educational Achievement

	Aggression		
Educational Achievement	Low	High	Total
No	309	56	365
	(84.7)	(15.3)	(100)
Yes	129	50	179
	(72.1)	(27.9)	(100)
Total	438	106	544
	(80.5)	(19.4)	(100)

$X^2(df = 1) = 11.35; p < 0.001.$

father alcoholic, mother mentally ill, relational problems at school, broken home before six, and broken home before 17.

In the further analyses, the following four factors of early life were considered to be the most important ones: having been misunderstood, bad contact with mother, early behavioral disturbances, and good educational achievement. These factors were positively intercorrelated with each other. All of the 16 possible combinations were represented in the population studied, however. The mean aggression scores in these groups with different combinations of early factors are shown in figure 18–8. Of the single factors, educational achievement predicted the largest increase in mean aggression score. Among the two-factor combinations, educational achievement and having been misunderstood was the strongest set. Of the three-factor combinations, the same two variables in combination with early behavioral disturbance was the strongest set predicting high aggressivity in adulthood.

To test the hypothesis that the four factors independently of each other were associated with aggressivity, a series of nonparametric partial correlation analyses were performed. These analyses showed that each of the four factors contributed to the aggression score independently of the other three factors (and age and social class). The following significant p-values were obtained: Educational achievement ($p < 0.001$), having been misunderstood ($p < 0.01$), bad contact with mother ($p < 0.01$), early behavioral disturbance ($p < 0.05$).

Figure 18–9 shows the aggression score distributions in the subgroups with no, one, two, three and all four of these risk factors. In the last subgroup the distribution is uniform and 50% of the women belong to the aggressive quintile of the total sample.
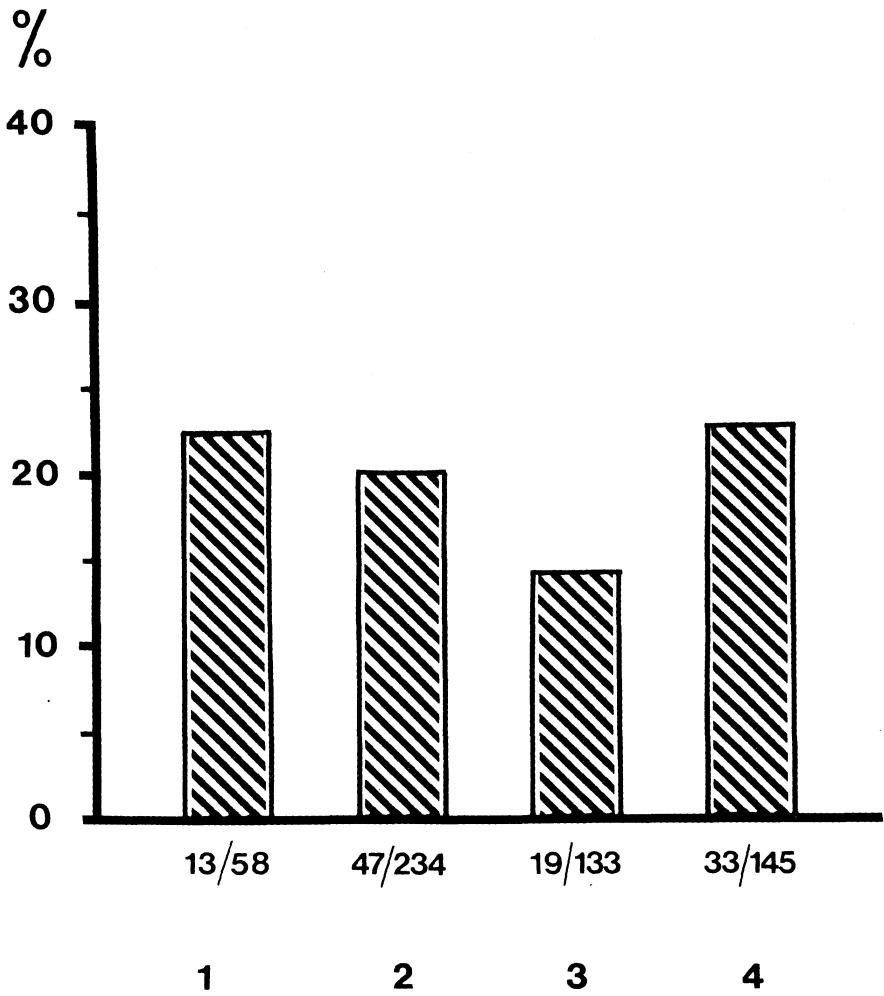
Figure 18–7. High Aggression Rate (%) by Father's Occupational Status (Social Class)
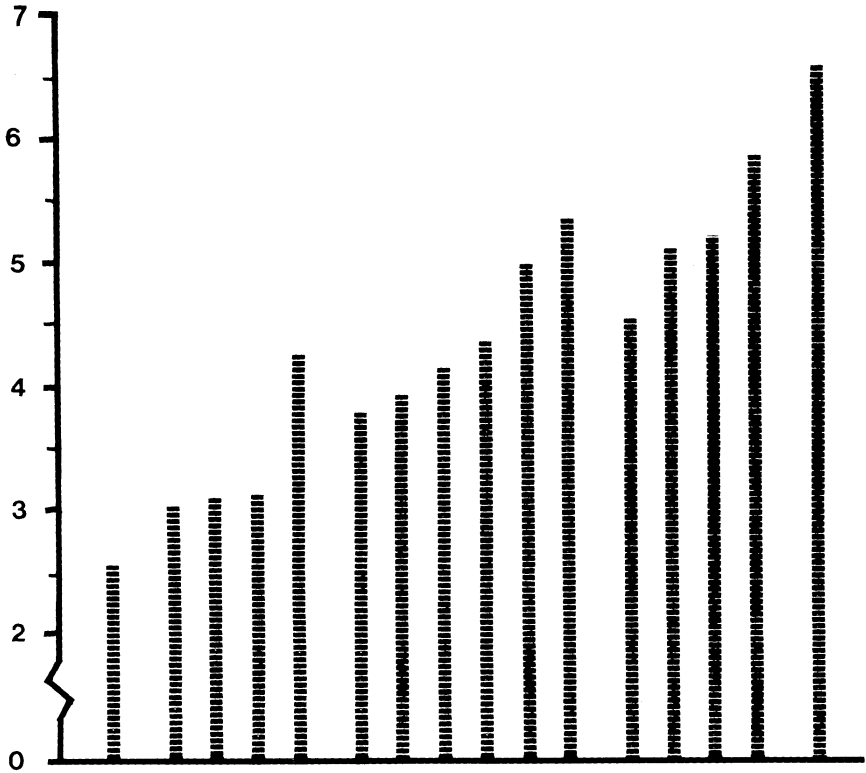
Bad cont.	0	1	0	0	0	0	0	1	1	1	0	1	1	1	0	1
Misunder.	0	0	1	0	0	1	0	0	0	1	1	1	0	1	1	1
Beh.dist.	0	0	0	1	0	1	1	1	0	0	0	0	1	1	1	1
Educ. ach.	0	0	0	0	1	0	1	0	1	0	1	1	1	0	1	1
N:o	140	31	26	42	43	22	16	21	22	35	22	30	9	48	13	24

Figure 18–8. Mean Aggression Score in Different Combinations of Early Factors
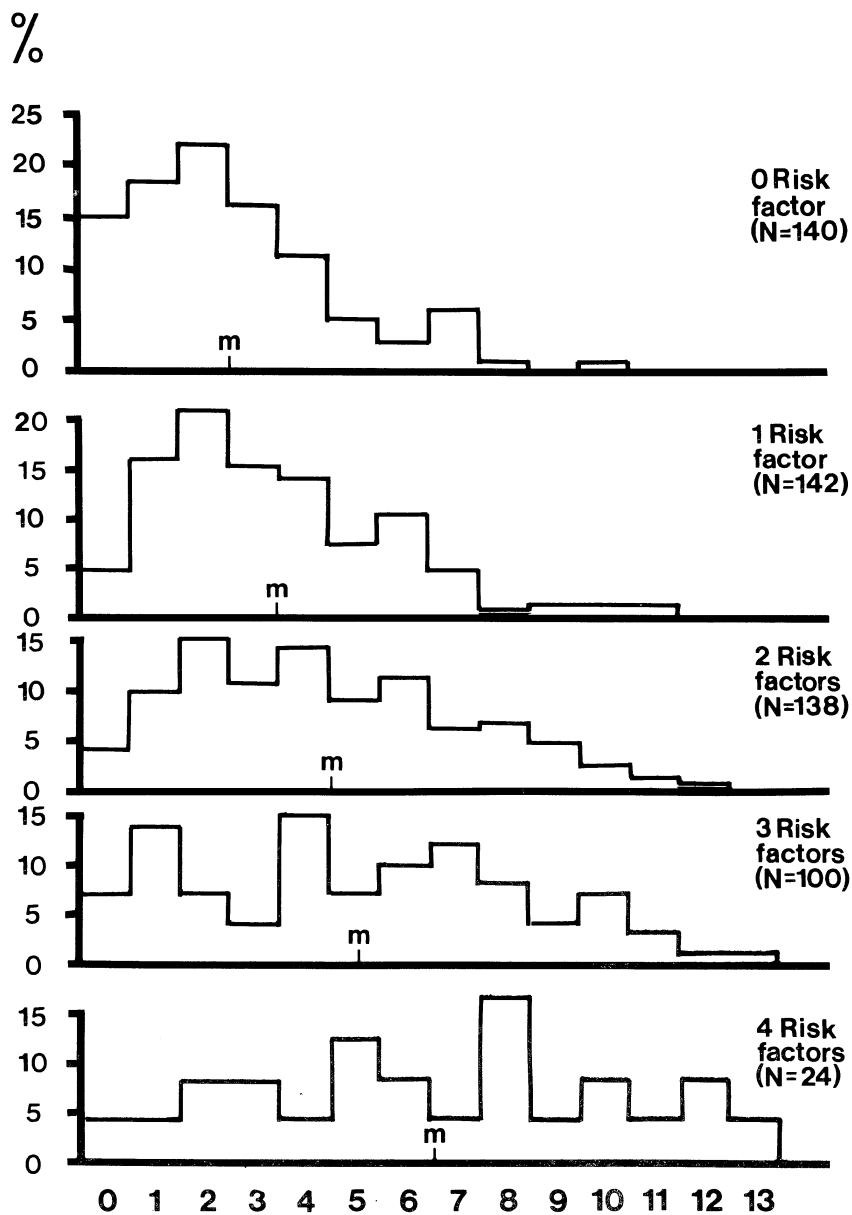
Figure 18–9. Frequency Distributions of Aggression Scores by Number of Early Factors

High Aggression in Relation to Psychiatric Illness and Psychophysiological Symptoms

The subjects belonging to the aggressive quintile were significantly more often found among those who had been or were psychiatrically ill ($p < 0.01$ in both cases); the frequency increased with rising disability grade (figures 18–10 and 18–11). The same trends were found for current depressive disorder, the intensity of which was either globally rated ($p < 0.001$) (figure 18–12) or rated according to the Hamilton Rating Scale ($p < 0.0001$). High aggression was also associated with suicidal behavior during life ($p < 0.00001$) (figure 18–13), bodily tension ($p < 0.0001$), restlessness ($p < 0.05$), chest pains ($p < 0.05$), sleep disturbance ($p < 0.05$) and tiredness ($p < 0.01$). In all tests, allowances were made for age and social class. No significant relations were found between aggression and panic attacks (frequency), phobia grade, current psychotropic medication (frequency), headache, bodily aches/pains or low back pain.

Aggression in Relation to Early Experiences and Psychiatric Illness

A series of nonparametric partial correlation analyses showed that three out of four tested early experience factors contributed to the aggression score independently of current grade of psychiatric illness, age, and the three other early experience factors. The following significant p-values were obtained: Educational achievement ($p < 0.00001$), having been misunderstood ($p < 0.01$), bad contact with mother ($p < 0.05$). The relation between early behavioral disturbance and aggression did not reach significance, however, when allowances were made for current grade of psychiatric illness, age, and the other three early experience factors simultaneously. On the other side, current grade of psychiatric illness was still significantly ($p < 0.01$) associated with aggression when allowances were made for the four early experience factors and age simultaneously.

High Aggression in Relation to Social Functioning

High aggression occurred significantly ($p < 0.05$) more often in the higher social classes according to own occupational status (when adjustments were made for age and husband's occupational status). The rate of high aggression was least in the group of women who had never had an occupation (figure
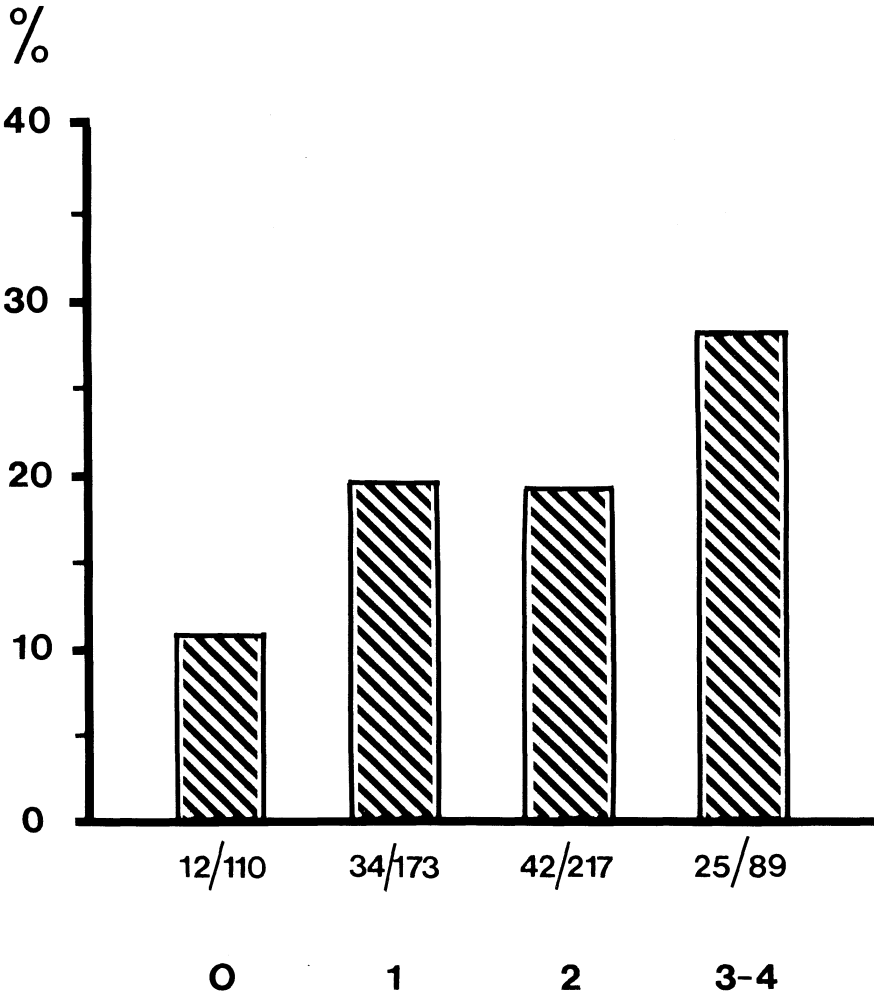
Figure 18–10. High Aggression Rate (%) by Psychiatric Illness During Life (Maximum Disability Grade)
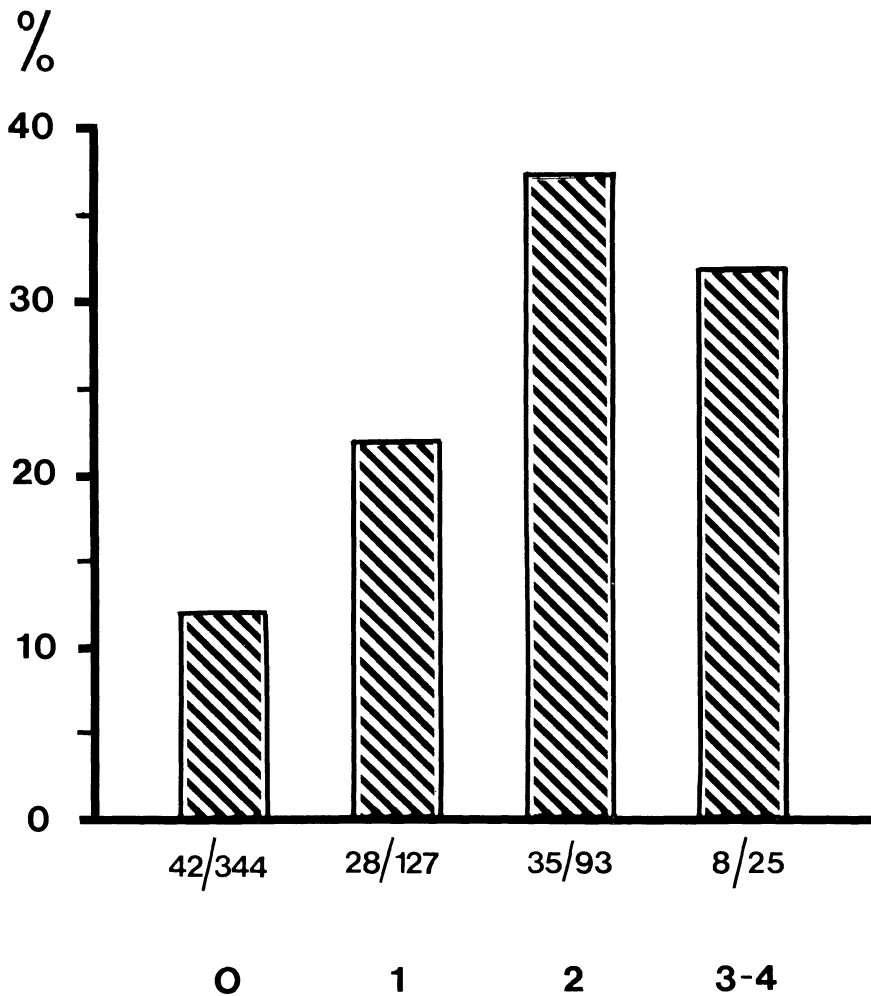
Figure 18–11. High Aggression Rate (%) by Current Psychiatric Illness (Disability Grade)
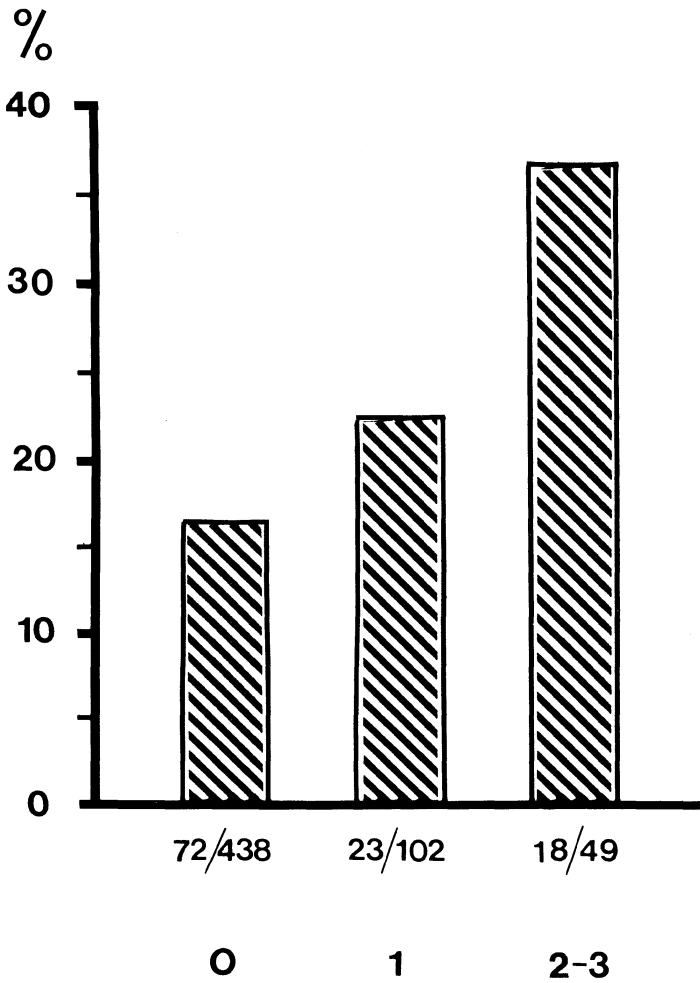
Figure 18–12. High Aggression Rate (%) by Grade of Depression
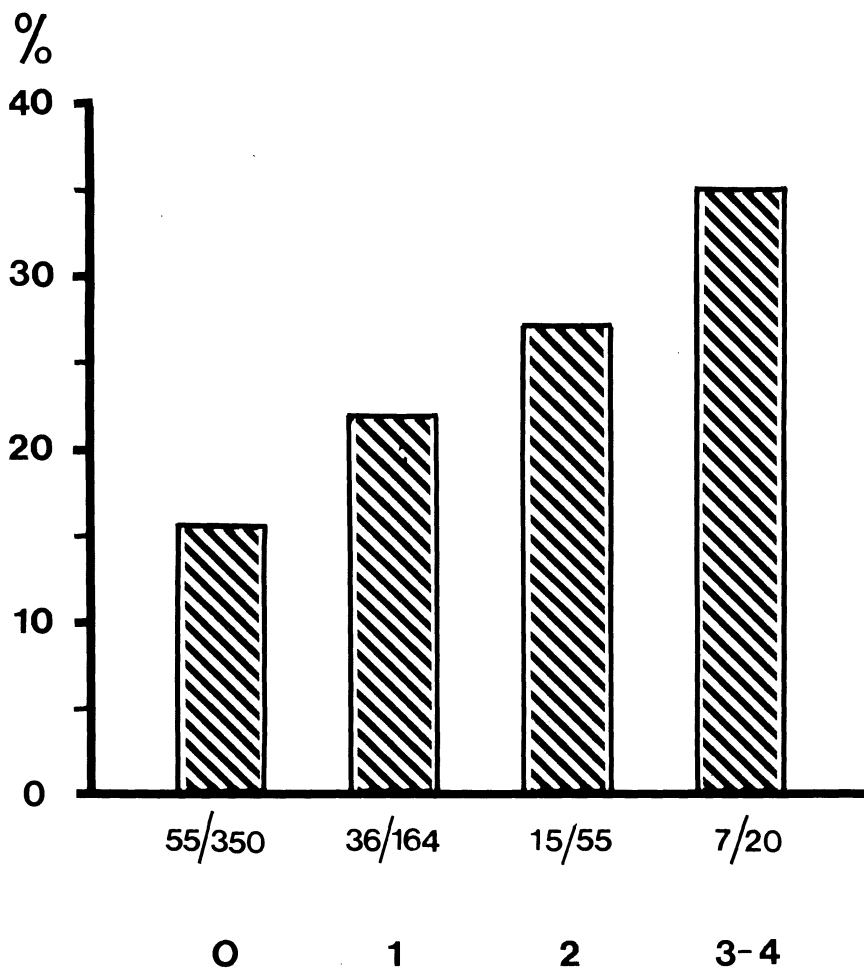
Figure 18–13. High Aggression Rate (%) by Suicidal Behavior During Life (Maximum Degree)
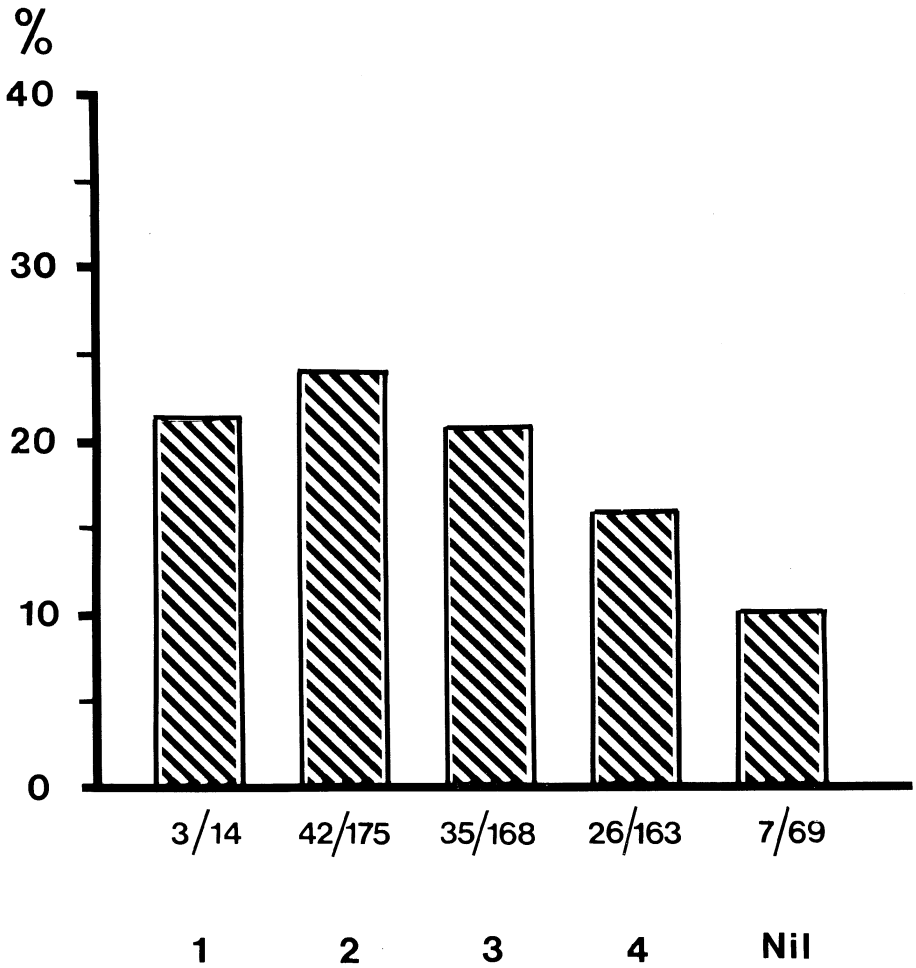
Figure 18–14. High Aggression Rate (%) by Own Occupational Status

18–14). Bad adaptation to job situation was associated with aggression ($p < 0.05$). High aggression had a higher ($p < 0.05$) rate among divorced and widows than in the married or unmarried group (figure 18–15).

Other variables reflecting various aspects of social and interpersonal functioning were not significantly related to high aggression, when age and social class were controlled. These variables were: Social class according to husband's occupational status (only age was controlled) (figure 18–16), job involvement, cohabitating with a man or not, number of children, changes in quality of marriage, own sexual desire, coital frequency, orgasmic capacity, contact with others outside own family, and number of psychosocial stressors last year.

Discussion

Methodology

The aggression scale satisfies conventional requirements as to homogeneity and reliability and some attempts at validation have been made (Cesarec and Marke 1968). It is evident that the aggression scale is only capable of assessing conscious aggressive impulses and behavior. A general problem inherent in self-ratings is the possible effect of the tendency to give conventionally desirable answers. It could be argued that females who did not conform to a traditional sexrole (i.e., a low aggression profile) were possibly prone to give less socially desirable answers about their childhood. However, the high aggression subjects did not differ in their answers regarding some other items highly vulnerable to distortions from social conventions (e.g., father's social class, father's and mother's mental health, father's alcoholism and changes in quality of own marriage). The main results of the present study are also well in line with earlier works (Kagan and Moss 1962, Becker et al. 1962, Eron et al. 1963, 1974). The conclusion is therefore drawn, that the differences found between the aggressive subjects and the others are probably, to a great extent, real ones and not merely expressions of different response styles in the two groups.

Age and Climacteric Phase

In the studied sample of urban Swedish women, the youngest group (age 38) was the most aggressive one. This difference may indicate a true age trend as
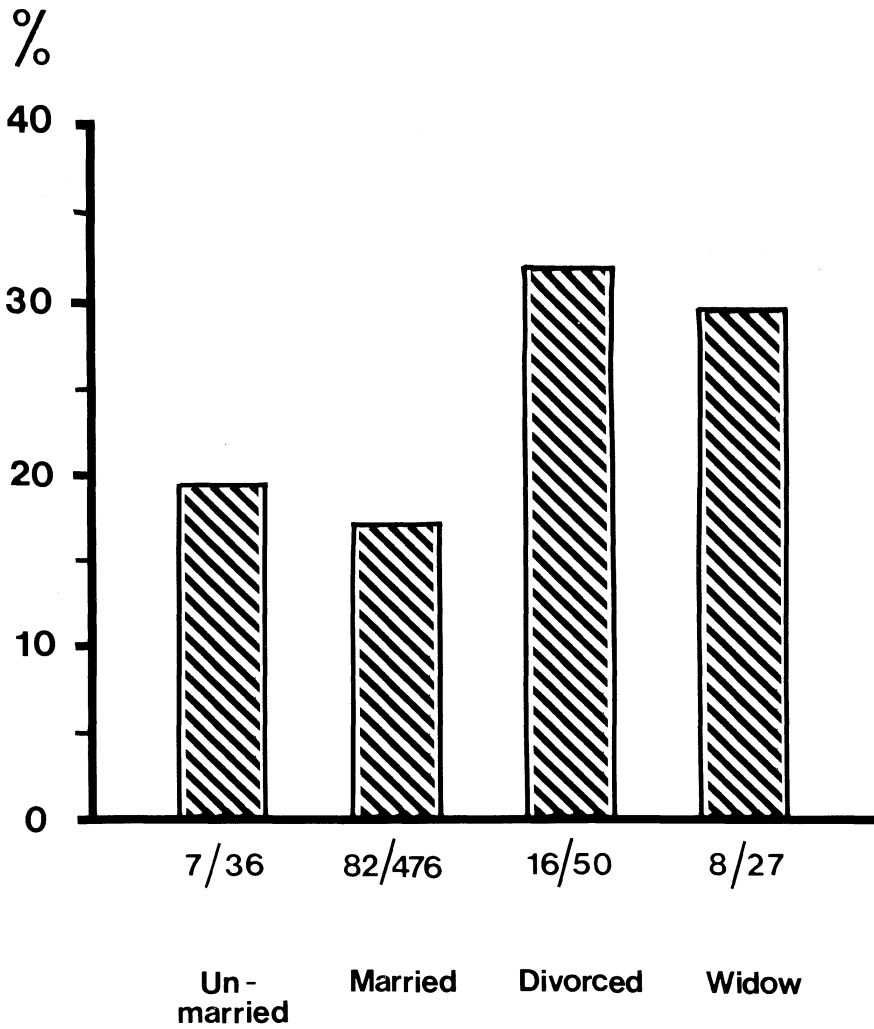
Figure 18–15. High Aggression Rate (%) by Marital Status
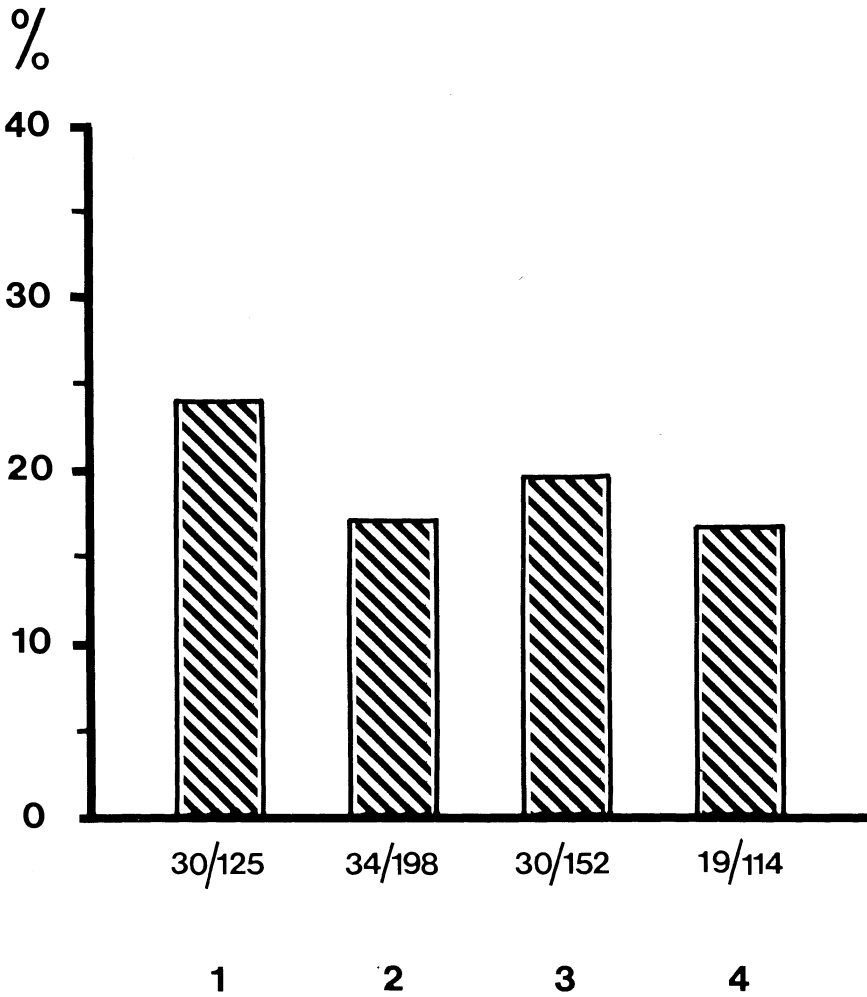
Figure 18–16. High Aggression Rate (%) by Social Class (Husband's Occupational Status Primarily)

it remained significant when educational achievement was controlled. The data are cross-sectional, however, and it is not possible to rule out a generational trend.

The absence of a relation between climacteric phase and high aggression doesn't seem to be in perfect accordance with the findings of Jaszmann et al. (1969) who found that "irritability" was most prevalent in the peri-menopausal years. The probable explanation is that Jaszmann et al. assessed symptoms of a more variable nature while in the present investigation a relatively permanent aggressive component of personality was rated.

Early Experiences and Behavior

The reporting of parental hostility and bad emotional contact with the parents by aggressive subjects, especially with mothers, is in broad accordance with earlier studies on children (Becker et al. 1962) and on adolescents (Eron et al. 1963, 1974). Kagan and Moss (1962) in their prospective study up to age 20–29 found that maternal hostility toward the daughter during the first three years, together with acceleration during age 6 to 10, were associated with childhood achievement and adult intellectual mastery in the women. This finding agrees well with the results in the present study where the group of females with the best parental relations had the lowest rate of educational achievement.

Kagan and Moss further found that acceleratory mothers produced aggressive daughters, but aggressive girls did not grow up to be aggressive adults (while aggressive boys did). However, Eron et al. (1974) found a high correlation between aggression at ages 8 and 18 both in males and females. It seems justifiable to summarize the findings in the present investigation against the background of the two studies mentioned above in the following way: Hostile and acceleratory mothers create daughters who, early in life, experience a bad emotional contact with the mother. They behave aggressively and competitively and achieve well in school and afterwards in spite of early behavioral disturbances. They tend to climb upwards socially and retain much of their aggression up to the age of 50 or more.

The different phases of this process probably gradually raise the risk for the development of a personality structure with a high aggression potential. In the present study, four early factors were identified which, independently of each other, raise the risk for high aggression in adulthood. These risk factors were, with the weakest first: Bad emotional contact with mother, early behavior disturbance, having been misunderstood, and educational achievement.

Two sets of factors reflecting socioeconomic status during childhood and mental health of parents were not related to high aggression. This is not in accordance with the finding of Eron et al. (1974) of a positive relationship between high social class of father and high aggression in the 18 year old daughters.

Psychiatric Illness

The finding of a strong positive association between aggression and mental illness, especially depression, was not unexpected. Since long ago this relation has been in the focus of interest by psychoanalytic writers (Abraham 1927, Klein 1934) and, more recently, by others (Kendell 1970, Cochrane 1975).

Early Experiences and Psychiatric Illness

There are significant associations between some of the early factors and psychiatric illness (Hällström 1973). The present study shows that there is also a positive relation between psychiatric illness and aggression when the early factors are controlled. However, the analyses clearly demonstrate that these associations cannot explain the relationship between aggression on the one hand and the factors of bad contact with mother, having been misunderstood, and educational achievement on the other. Thus, psychiatric illness or depression cannot be labelled as intervening variables in the link between these early factors and aggression. However, psychiatric illness, but not depression, does really seem to intervene in one relation, the link between early behavior disturbance and aggression.

It has thus been demonstrated that at least three factors or groups of factors are partly independently associated with the development of aggression as a relatively stable personality trait. The first group is negatively perceived parent child relations (bad contact with mother and having been misunderstood). The aggression component related to these factors can be thought of as a response to frustration (Dollard et al. 1939) or learned behaviour, i.e. parental identification or modelling (Eron et al. 1974). The second factor is educational achievement. It is possible that aggression related specifically to this is merely the effect of accelerating mothers but biological (endocrine, constitutional) factors cannot be excluded. The third group of factors has to do with psychiatric illness during life, especially depression. The aggression potential related specifically to psychiatric illness

or depression might have been causally involved in the illness development or might have been a secondary phenomenon (Cochrane 1975).

Social Functioning

There is little remarkable in the social functioning of the females with high aggressivity. The most important feature, which has already been dealt with, is the tendency of upward social mobility reflecting the more intense striving for achievement in this group.

Another expected finding is the higher prevalence of aggressive women among the divorced and widows. From this study it is not possible to establish if high aggressivity is a cause for or a consequence of the divorce. The widow's aggression is probably mainly a consequence of her widowhood. It should be mentioned, however, that the battery of preselected and defined psychosocial stressors did not show any relationship with aggression (but a significant association with incidence of mental illness). It seems obvious that the aggression score doesn't readily change with life changes in general.

It is noteworthy that in spite of a higher prevalence of mental health problems, the females with high aggression do not differ from the others regarding job involvement, marital relations including sexual functions, and social contacts outside family.

Acknowledgments

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19 FAMILIAL CHARACTERISTICS OF ADOLESCENTS VULNERABLE TO SUBSEQUENT ANTISOCIAL DISORDERS

Jeri A. Doane and Michael J. Goldstein

Introduction

Are there intrafamilial attributes that are uniquely characteristic of families of antisocial young adults? The UCLA Family Project was designed specifically to answer questions such as this. In 1965 the project began with the goal of studying the family's contribution to the etiology of schizophrenia, (table 19–1). The project is a longitudinal, prospective study of groups of disturbed adolescents thought to vary in their degree of risk for subsequent schizophrenia and schizophrenia—like conditions. Although the original aim was to attempt to identify marker variables which could serve as predictors of schizophrenia, analysis of the first five year followup of this sample revealed that in addition to those who developed schizophrenic disorders, there were

Table 19-1. Overview of UCLA Family Project

	Initial Assessment	5 Years	15 Years
TARGET ADOLESCENT	Initial Interview Psychological Testing (TAT, etc.)	Reassessment Interview	Reassessment Interview & TAT
PARENTS	Interview Psychological Testing (TAT, etc.)	Interview	Interview & Family History of Mental Illness
FAMILY	Direct Interaction Tasks MO & TC FA & TC MO & FA & TC		

also a sizable number of individuals who developed an antisocial personality. The emergence of this subgroup provided a unique opportunity to compare and contrast the familial attributes of antisocial young adults with those who developed other psychiatric disorders.

Previous reports from this project (e.g., Doane, West, Goldstein, et al., 1981) provided evidence that familial attributes play an important role in the development of schizophrenia and related disorders. The obvious next question was, do they have a unique role in the development of other disorders such as antisocial personality? The present study attempts to address this issue of whether intrafamilial variables would allow us to discriminate among three different types of psychiatric outcome: first— normal or neurotic individuals, second—those with a diagnosis of antisocial personality, and third—those with a nonantisocial, schizophrenia-like disorder.

Subjects

A total of 65 moderately disturbed male and female adolescents and their parents participated in the project. The families were middle to upper middle class and were carefully assessed and screened to insure that none of the adolescents were psychotic or had psychotic-like symptoms. The rationale for using nonpsychotically disturbed adolescents as a high risk group was based on the general hypothesis that adolescence is a critical period in

psychosocial adaptation and that failures at this point increased the likelihood of subsequent difficulties.

The adolescents and their parents participated in an intensive initial assessment phase, including interviews, psychological testing, physiological measures, and several directly observed interaction tasks (See Goldstein, Judd and Rodnick, 1968, for further details). The findings to be reported here are derived from three of these interactions tasks: (1) a dyadic discussion between the adolescent and his mother, (2) a dyadic discussion between the adolescent and his father, (3) and a triadic family discussion involving the adolescent and both parents. In these discussion tasks, the participants were asked to discuss a problem that had been previously identified as unique to their family situation. The procedure is designed to elicit an emotionally charged discussion between the participants.

Adolescent Problem Groups

At the time of the initial assessment, each adolescent was classified into one of four empirically derived problem groups based on the adolescent's presenting symptoms. As defined in table 19–2, Group I cases were acting out and in trouble in the school or community. While there might also be some acting out at home, these adolescents' problems more likely involved drugs, the police, school authorities and so on. Group II adolescents were belligerent and antagonistic, but these attitudes and behaviors were confined

Table 19–2. Adolescent Problem Groups at Initial Assessment (N = 52)

GROUP I:	AGGRESSIVE/ ANTISOCIAL (n = 13)	Poor impulse control and acting out, primarily in the school or community setting. Some inner turmoil.
GROUP II:	ACTIVE FAMILY CONFLICT (n = 15)	Belligerence and antagonism in family setting. Inner distress. Slight or no aggressiveness/ rebelliousness outside family.
GROUP III:	PASSIVE, NEGATIVE (n = 11)	Negative, sullen, noncommunicative towards parents. Indirect hostility. Superficial compliance. Underachievement in school.
GROUP IV:	WITHDRAWN, ISOLATED (n = 13)	Marked social isolation. Few or no friends. Excessive dependence on parents. Anxiety.

primarily to the family setting. In contrast to the first two groups, the Group III adolescents were more passive and displayed a negativistic, uncommunicative stance towards the parents, and superficial compliance in the school setting. The Group IV adolescents were withdrawn, social isolates who were markedly dependent upon their parents.

Five Year Follow-Up Assessment

Five years after the initial assessment phase, 52 of the adolescents were reassessed and blindly diagnosed using the Research Diagnostic Criteria (RDC), developed by Spitzer, Endicott and Robins (1975), and the Gunderson Borderline Evaluation Schedule (1977). In addition, extensive questionnaires on drug usage and sexual behavior were employed.

There are several different ways that one can group these diagnostic data depending upon the purposes of the analysis. In the past, we have used the Wender Scale (Wender, Rosenthal and Kety, 1968) which is a seven point scale ranging from no psychiatric disturbance to a series of disorders that are called extended schizophrenia spectrum—for example, borderline disorder, schizoid personality, severe character disorder, and probable or definite schizophrenia. After diagnosis the subjects were classified on this seven point scale and were then regrouped into four categories: First—normal to neurotic cases with no evidence of antisocial personality (n = 29); second—antisocial personality without secondary diagnoses such as borderline disorder or definite drug abuse (n = 6); third—a more disturbed group of antisocial cases—that is, those who were within the schizophrenia spectrum range of the Wender Scale (n = 7). These individuals were more disturbed than the other antisocial cases in that they had additional, secondary diagnoses of definite drug abuse and/or borderline personality. The fourth group consisted of cases with schizophrenia spectrum disorders but without any antisocial features (n = 10).

Adolescent Problem Group as a Predictor
of Diagnostic Group

The first question we asked was, does past behavior predict subsequent behavior? In particular, do aggressive, antisocial adolescents (Group I)

Table 19-3. Adolescent Problem Group as a Predictor of Outcome Diagnosis (N = 52)

Problem Group	Normal → Neurotic Nonspectrum	Antisocial Nonspectrum	Antisocial Spectrum	Non-Antisocial Spectrum
I Aggressive Antisocial (n = 13)	5	3	3	2
II Active Family Conflict (n = 15)	9	1	4	1
III Passive, Negative (n = 11)	8	2	0	1
IV Withdrawn, Isolated (n = 13)	7	0	0	6

become antisocial young adults? In table 19–3 adolescent problem group was used to predict outcome at the time of the five year followup. No systematic differences were observed for males and females, so they were grouped together for this and subsequent analyses. Of the 13 Group I adolescents, six received antisocial diagnoses at followup. However, the antisocial young adults don't come from Group I exclusively, as 5 of 15 Group II cases were so diagnosed at followup. Thus, the antisocial young adults were almost exclusively from Groups I and II, adolescents whose disturbance was active and aggressive, either inside and/or outside the home.

The non-antisocial spectrum cases in contrast, arise primarily from Group IV, the withdrawn/isolated group. Interestingly, Group III cases, the passive negative types of adolescents, are more likely to have relatively benign outcomes.

In short, we can say that the adult antisocial cases almost always have a history of aggressive, active types of behavior as adolescents (11 of 13 cases). However, we cannot say that a history of actively aggressive behavior in adolescence necessarily leads to a continuation of this kind of behavior

into adulthood, as half of the Group I and II cases have a nonantisocial outcome.

Parental Affective Style

Since not all of the adolescents with an actively aggressive history were antisocial later, we wondered whether measures of intrafamilial relationships, obtained during adolescence, would help us to understand why some of these cases developed antisocial disorder and others did not.

In a previous report (Doane, West, Goldstein, et al., 1981) an index of parental affective style, measured in a triadic family discussion task, obtained at the time of initial assessment, was useful in separating the spectrum from nonspectrum outcomes. The affective style (AS) index provides a measure of the quality or nature of emotionally toned remarks made by the parent to the child in a face to face discussion task.

Three classes of negative affective style were coded from typed transcripts of the interaction tasks: criticism, guilt inducement, and intrusiveness. Two types of criticism were distinguished—benign and personal, with the latter defined as a more intense or generalized form of criticism. Examples of personal criticism (table 19–4) are parental statements such as: "You've got an ugly, arrogant attitude," or "The reason you have no friends is because of your personality." Examples of benign criticism would be remarks such as: "When you're screaming and yelling, I can't understand you," or "Let's face it, whenever you take the car, you get into trouble." Guilt inducing remarks are statements like, "You cause our family an awful lot of trouble," or, "You could have mowed the lawn; now we have to pay a gardener to do it." Intrusive remarks imply knowledge of the child's thoughts, feeling states, or motives when in fact there is not apparent basis for such knowledge. A benign intrusive remark would be a statement such as, "You say you're depressed, but I think you're really angry," or, "You know you always feel better when you tell me what's on your mind." A critically intrusive remark would be a statement such as, "You're doing that just to hurt me."

Affective Style Profile Groups

In previous studies (Doane, West, Goldstein, et al.; Doane, Golstein and Rodnick, 1981), a profile approach to categorizing parents on the affective style measure was useful in predicting schizophrenia-spectrum disorders. Two profiles are used—benign and negative. The negative profile contains at

Table 19–4. Negative Affective Style Codes

CRITICISM
1. Personal Criticism
Unnecessary or overly harsh modifiers; and/or,
negative reference to broad classes of behavior; and/or,
negative evaluation of the child's character or nature.
2. Benign Criticism
Mild; circumscribed; matter-of-fact; direct towards specific incidents or sets
of behaviors

GUILT INDUCTION
Conveys child is to blame or at fault for some negative event, and, parent has
been distressed or upset by the event.

INTRUSIVENESS
Parent implies knowledge of child's thoughts, feelings, or motives without
basis for such knowledge.
1. Critical Intrusiveness
Contains a harsh, critical attribution of intent.
2. Neutral Intrusiveness
Neutral quality; refers to child's emotional states, ideas, preferences, etc.

least one instance of three negative marker codes (Personal Criticism, Guilt
Induction, Critical Intrusiveness) or 6 or more Benign Intrusive remarks.
These marker codes were previously found to be associated with a
schizophrenia-spectrum disorder and are listed in table 19–5. The benign
profile reflects a parental style in which these are not present.

For the triadic family discussion task each parental pair or unit was
assigned a family affective style profile, based on whether either parent had a
negative profile when interacting with the target adolescent. For the dyadic
discussion, each individual parent was assigned to one of two profile groups,
i.e., either benign or negative.

Family Affective Style Profile as a Predictor
of Outcome Group

A preliminary step was to determine whether affective style profiles in either
dyadic or triadic discussions were related to an antisocial outcome
independent of adolescent problem group. The results from these analyses
showed that in both settings a benign affective style was significantly

Table 19–5. Affective Style Profile Criteria

Negative Profile (at least one of the following)	Benign Profile
Personal criticism	Benign or no criticism
Guilt Induction	No Guilt Induction
Critical Intrusiveness	No Critical Intrusiveness
Excess Benign Intrusiveness	Mild or no Neutral Intrusiveness

Table 9–6. Maternal and Paternal Interactions AS Profile in Dyadic Interactions as Predictors of Outcome (N = 52)

AS Profile	5-Year Follow-up Diagnosis		
	Normal → Neutotic	Antisocial	Non-Antisocial
Mothers	Nonspectrum	Nonspectrum Spectrum	Spectrum
Benign n = 31	25	2 1	3
Negative n = 21	4	4 6	7
Fathers			
Benign n = 37	26	4 2	5
Negative n = 15	3	2 , 5	5

associated with a benign outcome. There was also a trend for a negative profile to be associated with either an antisocial or nonantisocial spectrum outcome. This relationship was most pronounced in the data obtained for the mother/adolescent dyadic discussions. As seen in table 19–6, 17 of the 21 mothers with a negative profile had offspring with a diagnosis of either antisocial personality or nonantisocial schizophrenia spectrum disorder. This benign-negative profile categorization did not however, allow us to discriminate between which type of negative outcome was manifested. Interestingly, and somewhat surprisingly, the relationship between a negative affective style and a poor outcome was not seen for fathers.

Maternal Affective Substyle as a Predictor of Outcome Group

Thus far, the profile approach—that is, a benign versus negative affective style in the dyad—did not reveal any specific interaction pattern unique to antisocial personality development. We thought perhaps this dichotomous profile was too broad an index to distinguish type of outcome diagnosis. Would prediction improve if mother's negative AS profile in the dyadic setting was redefined in terms of substyles? In table 19–7 maternal affective style was divided into four subtypes: (a) Benign—those whose negative remarks were benign or low-key in nature; (b) Critical—those who used harsh criticism but no guilt inducement; (c) Guilt Inducing—those who used guilt inducement irrespective of whether they also used harsh criticism; and (d) Intrusive—those who were excessively intrusive but refrained from using personal criticism or guilt inducement. The rationale for isolating the guilt inducing mothers in this fashion was the hypothesis that the use of a guilt inducing strategy implies a bond or tie of some kind between the adolescent and his parent, while criticism by itself does not.

In table 19–7 we can see for the first time that affective style distinguishes between antisocial and nonantisocial spectrum outcomes. Of the nine mothers with a critical AS substyle, eight have offspring with an RDC diagnosis of antisocial personality, and none have a nonantisocial spectrum offspring. Almost a mirror image is seen when one examines the offspring diagnoses of the nine mothers with a guilt inducing substyle. Seven of these cases have nonantisocial, schizophrenia spectrum disorders and only one has an antisocial diagnosis. The intrusive substyle was uncommon and was associated with a relatively good outcome.

Table 19–7. Maternal as Substyle in Dyadic Interaction as a Predictor of Outcome (N = 52)

AS Substyle	Outcome Diagnosis at Follow-up			
	Normal → Neurotic Nonspectrum	*Antisocial Nonspectrum*	*Spectrum*	*Non-Antisocial Spectrum*
Benign (n = 31)	25	2	1	3
Critical (n = 9)	1	3	5	0
Guilt-Inducing (n = 9)	1	0	1	7
Intrusive (n = 3)	2	1	0	0

Maternal Affective Substyle & Problem Group as Combined Predictors of Outcome

At this point in the analysis the obvious question was whether the maternal affective substyle of the Group I and II adolescents who became antisocial differed from that of the mothers of Group I and II cases who didn't. In figure 19–1, maternal affective substyle and adolescent symptom group were combined to predict outcome. Here we can see that within Group I, the adolescents who become antisocial young adults, with one exception, have mothers with a critical affective style. Those with a normal/neurotic outcome have mothers with a benign affective style.

Within Group II, the maternal affective style of the cases varies widely. However, those with a relatively benign outcome have mothers with a benign substyle. Although four of the five antisocial outcomes had mothers with a negative profile, the substyle of criticism was not unique to this group.

Group III cases tend to have relatively benign outcomes. Only two are

(N=52)

Group	AS Substyle	Normal → Neurotic / Nonspectrum	Antisocial Nonspectrum	Antisocial Spectrum	Non-Antisocial Spectrum
I (n)=13	Benign	[●●●●●]	■		▲
	Critical		[■■]	[■■■]	
	Guilt-Inducing				▲
	Intrusive				
II (n)=15	Benign	●●●●●●●			■
	Critical				■■
	Guilt-Inducing	●		■	▲
	Intrusive	●	■		
III (n)=11	Benign	●●●●●●	■		▲
	Critical	●	■		
	Guilt-Inducing				
	Intrusive	●			
IV (n)=13	Benign	[●●●●●●●]			▲
	Critical				
	Guilt-Inducing				[▲▲▲▲▲]
	Intrusive				
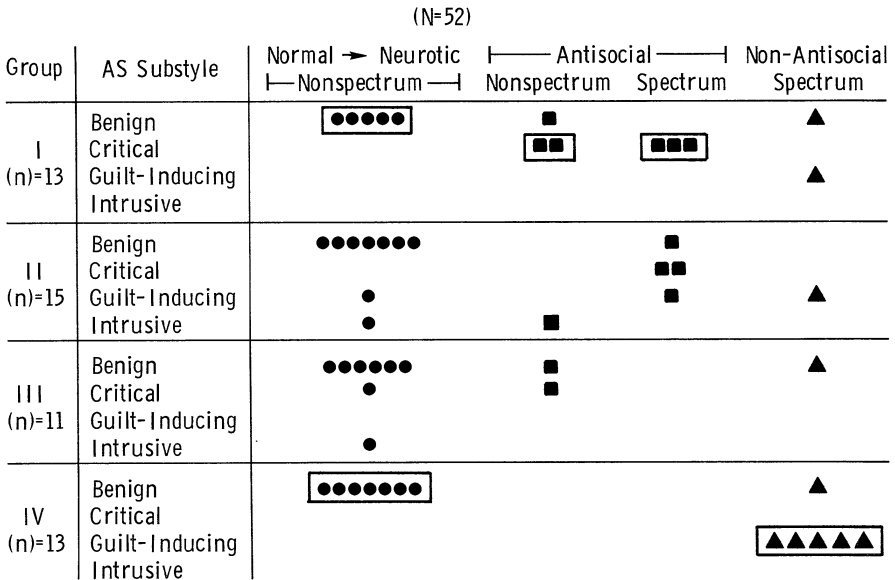
Figure 19–1. Maternal Dyadic as Substyle and Problem Group as Combined Predictors of Outcome

antisocial, and both cases are within the nonspectrum range of the Wender Scale.

In sharp contrast to Groups I and II, Group IV adolescents are never antisocial. However, 6 of the 13 have a nonantisocial spectrum disorder. Five of these six cases have mothers who employ a guilt inducing style when interacting with them.

The crucial issue at this point is whether the Group I and II mothers who use harsh criticism are reacting to something more noxious or disturbing in those particular adolescents. In other words, perhaps these adolescents have been acting out more seriously, or for a longer period of time. Or, perhaps these teenagers are more hostile or provocative towards the mother during the interaction. Maybe they have more aggressive or antisocial attitudes than those whose mothers use a benign affective style. We cannot conclusively answer these kinds of questions from our data since the adolescents were already disturbed at the time of initial assessment. However, we did go back and look at measures on the adolescents themselves to see whether any differential trends appeared which might address these issues.

First, preliminary blind ratings of overall severity of disturbance in Group I and II adolescents revealed no difference in severity of acting-out behavior for those with benign mothers versus those whose mothers were critical. Second, we examined the adolescents' affective style in the five Group I adolescents with benign mothers and a good outcome versus those five with critical mothers and antisocial outcome. Again, no systematic difference in the way they behaved during the interaction could be observed. Finally, we looked at independently rated measures of aggressive content on the Thematic Apperception Test (TAT). Again, Group I or II adolescents with critical versus benign mothers did not significantly differ. In fact, for the antisocial group as a whole, there were no significant differences on aggressive themes when they were compared with either the normal/neurotics or the non-antisocial spectrum cases.

Discussion

The data presented in this paper should be interpreted with caution as the period of followup is only five years. A second, 15 year followup is currently underway which will provide information concerning the stability of these diagnostic appraisals. Nevertheless, certain trends appear in the data.

First, there is a modest relationship between the form of adolescent psychopathology and type of early adult psychiatric disturbance. Individuals with antisocial features are likely to have been actively aggressive as

teenagers, either inside or outside the home, while the non-antisocial spectrum cases were often withdrawn and isolated. This finding is consistent with reports from Robins (1974) who found that all of her antisocial adults had histories of antisocial behavior during childhood. She also found, however, that not all aggressive children became antisocial young adults. Our results are consistent with this finding as well, since exactly half our actively aggressive type of adolescents did not go on to develop an adult diagnosis of antisocial personality.

A second finding is that a relatively benign or low-key style of expressing affective messages to the child is characteristic of both the mothers and fathers of cases who were in neither the antisocial group or the schizophrenia-spectrum group. Whether these adolescents with benign parents are less disturbing or less noxious individuals to live with cannot be answered conclusively in the present study. However, preliminary analysis of these cases suggests that cases with benign parents are not any less disturbed than those whose parents have a negative affective style. This finding that a benign parental affective style predicts a relatively better outcome raises the question of what exactly a benign affective style means. Does it reflect a more mature personality in that parent? Are these parents more effective in coping with teenage behavior problems by virtue of some parental trait or quality which allows the parent to convey dissatisfaction without the use of harsh criticism or guilt inducement? Or, alternatively, is there something about the adolescent which allows him to respond to more attenuated or benign forms of criticism, making harsher criticism unnecessary? In any case, it is important to remember that a benign affective style does not imply that the parent is doing something beneficial. Only that he or she is not doing something relatively more negative.

Finally, the different patterns seen in the data for the two poor outcome groups (see figure 19-1) suggests that both parental and child characteristics are important in predicting outcome. An adolescent history of aggressive acting-out behavior is clearly related to a deteriorating course of antisocial behavior on into adulthood. However, the better predictor of eventual course is a combined one—that is, an assessment that takes into account not only the quality of initial disturbance in the adolescent, but a measure of how the mother responds to it in her interaction with him. This finding is consistent with the work of Vaughn and Leff (1976) in Great Britain who have found that a high level of criticism expressed during an interview predicts a deteriorating course for recently discharged schizophrenics, alcoholics, and depressives. Why this finding does not exist for fathers in our sample is somewhat mysterious. However, it is important to note that many of the

fathers of antisocial cases used harsh criticism, but it was not as consistently related to outcome as maternal data.

Caution should be used because the sample is small and not representative of the total socioeconomic range. However, there are certain findings concerning specific family attributes, which when combined with a tendency towards antisocial behavior, greatly increase the risk for continuation of that behavior into adulthood. We hope that other longitudinal studies can incorporate similar parental measures to test the replicability of these findings.

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