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KEY RESULTS FROM THE FIRST FORTY YEARS OF THE CAMBRIDGE STUDY IN DELINQUENT DEVELOPMENT

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The Cambridge Study in Delinquent Development is a prospective longitudinal survey of the development of offending and antisocial behavior in 411 South London boys, mostly born in 1953. These males have been followed up by personal interviews from age 8 to age 46. The Study began in 1961, and for the first 20 years was directed by Donald West. I joined him to work on it in 1969, and I have directed the Study for the past 20 years. It has been funded primarily by the Home Office and secondly by the Department of Health. Results of the Study have been described in four books (West, 1969, 1982; West & Farrington, 1973, 1977), and in nearly 120 articles: see Farrington and West (1990) and Farrington (1995b). This chapter focusses particularly on the most recently obtained results.

METHODS

Aims

The original aim of the Study was to describe the development of delinquent and criminal behavior in inner-city males, to investigate how far it could be predicted in advance, and to explain why juvenile delinquency began, why it did or did not continue into adult crime, and why adult crime often ended as men reached their twenties. The main focus was on continuity or discontinuity in behavioral development, on the effects of life events on development, and on predicting future behavior. The Study was not designed to test any one particular theory about delinquency but to test many different hypotheses about the causes and correlates of offending, and many different mechanisms and processes linking risk factors and antisocial behavior.

One reason for casting the net wide at the start and measuring many different variables was the belief that theoretical fashions changed over time and that it was important to try to measure as many variables as possible in which future researchers might be interested. Another important reason was that, in testing hypotheses about the causes of offending, it was essential to investigate how far one risk factor predicted delinquency independently of all other plausible explanatory factors. Another reason for measuring a wide range of variables was the fact that long-term longitudinal surveys were very

uncommon, and that the value of this particular one would be enhanced if it yielded information of use not only to criminological researchers but also to those interested in alcohol and drug use, educational difficulties, poverty and poor housing, unemployment, sexual behavior, aggression, other social problems, and human development generally.

Characteristics of the Sample

At the time they were first contacted in 1961-62, the boys were all living in a working-class area of South London. The vast majority of the sample was chosen by taking all the boys who were then aged 8-9 and on the registers of 6 state primary schools within a one mile radius of a research office which had been established. In addition to 399 boys from these 6 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. Hence, the boys were not a probability sample drawn from a population, but rather a complete population of boys of that age in state schools in that area at that time.

Most of the boys (357, or 87%) were white in appearance and of British origin, in the sense that they were being brought up by parents who had themselves been brought up in England, Scotland, or Wales. Of the remaining 54 boys, 12 were Black, having at least one parent of West Indian (usually) or African origin. Of the remaining 42 boys of non-British origin, 14 had at least one parent from the North or South of Ireland, 12 had parents from Cyprus, and the other 16 boys had at least one parent from another country (Poland, Malta, Germany, France, Australia, Spain, Sweden and Portugal). On the basis of their fathers' occupations when they were aged 8, 94% of the boys could be described as working-class (categories III, IV or V on the Registrar General's scale, describing skilled, semi-skilled or unskilled manual workers), in comparison with the national figure of 78% at that time. The majority of the boys were living in conventional two-parent families with both a father and a mother figure; at age 8-9, only 6% of the boys had no operative father and only 1% had no operative mother. This was, therefore, overwhelmingly a traditional White, urban, working class sample of British origin.

Data Collected at Different Ages

A major aim in this survey was to measure as many factors as possible that were considered (at that time) to be causes or correlates of offending. The boys were interviewed and tested in their schools when they were aged about 8-9, 10-11 and 14-15, by male or female psychologists. For simplicity, these tests are referred to as the tests at ages 8, 10 and 14. The males were interviewed in our research office at about 16, 18 and 21, and in their homes at about 25 and 32, by young male social science graduates. A ninth interview at age 46 is currently under way (see later).

At all ages except 21 and 25 (when subsamples were interviewed), the aim was to interview the whole sample, and it was always possible to trace and interview a high proportion; 389 out of 410 still alive at age 18 (95%) and 378 out of 403 still alive at age 32 (94%), for example. The tests in schools measured individual characteristics such as intelligence, attainment, personality, and psychomotor impulsivity, while information was collected in the interviews about such topics as living circumstances, employment histories, relationships with females, children, illnesses and injuries, leisure activities such as drinking, drug use, physical fighting, and offending behavior.

In addition to interviews and tests with the boys, interviews with their parents were carried out by female psychiatric 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 education. The primary informant was the mother, although many fathers were also seen. The parents provided details about such matters as the boy's daring or nervousness, family income, family size, their employment histories, their history of psychiatric treatment, their child-rearing practices (including attitudes, discipline, and parental disharmony), their closeness of supervision of the boy, and his temporary or permanent separations from them. Obstetric records were obtained for boys born in hospitals. Also, when the boy was aged 12, the parents completed questionnaires about their child-rearing attitudes and about his leisure activities.

The teachers completed questionnaires when the boys were aged about 8, 10, 12 and 14. These furnished data about their troublesome and aggressive school behavior, their restlessness and poor concentration, their school achievement and their truancy. Delinquency rates of secondary schools were obtained from the local education authority. Ratings were also obtained from the boys' peers when they were in the primary schools, about such topics as their daring, dishonesty, troublesomeness and popularity.

Searches were also carried out in the central Criminal Record Office in London to try to locate findings of guilt of the males, of their biological mothers, fathers, brothers and sisters, of their wives and female partners, and of people who offended with them (their co-offenders). The minimum age of criminal responsibility in England is 10. The Criminal Record Office contains records of all relatively serious offenses committed in Great Britain or Ireland. In the case of 18 males who had emigrated outside Great Britain and Ireland by age 32, applications were made to search their criminal records in the 8 countries where they had settled, and searches were actually carried out in five countries. Since most males did not emigrate until their twenties, and since the emigrants had rarely been convicted in England, it is likely that the criminal records are quite complete.

The latest search of conviction records took place in the summer of 1994, when most of the males were aged 40. Between ages 10 and 16 inclusive (the years of juvenile delinquency in England at that time), 85 males (21%) were convicted. Altogether, up to age 40, 164 males (40%) were convicted (Farrington *et al.*, 1996, 1998). Convictions were only counted if they were for offenses normally recorded in the Criminal Record Office, thereby excluding minor crimes such as common assault, traffic infractions and drunkenness. The most common offenses included were thefts, burglaries and unauthorized takings of vehicles, although there were also quite a few offenses of violence, vandalism, fraud and drug abuse. In order to supplement official records information about delinquency and crime, self-reports of offending were obtained from the males at every age from 14 onwards (Farrington, 1989c).

Tracing and Securing Cooperation

Tremendous efforts were made to secure interviews, because of our belief (based in part on previous results obtained in this survey) that the most interesting subjects in any research on offending tended to be the hardest to locate and the most uncooperative. Surveys in which less than 75% of the target sample are interviewed may produce results that seriously underestimate the true level of criminal behavior (see Capaldi & Patterson, 1987, for a review of response rates in longitudinal surveys). Generally, an increase in the percentage interviewed from 75% to 95% leads to a disproportionate increase in the validity of the results; for example, at age 18, 36% of the one-sixth of the sample who were the most difficult to interview were convicted, compared with only 22% of the majority who were interviewed more easily, a statistically significant difference (West & Farrington, 1977).

At age 32, after a great deal of detective work, every one of our men was located. Up to this age, 8 of the men had died, and 20 had emigrated permanently. Of the remaining 383 who were alive and in the United Kingdom, 360 were interviewed personally (94%). Seven of the 20 emigrated men were also interviewed, either abroad or during a temporary return visit that they made to the United Kingdom, giving a total number interviewed of 367. In addition, 9 emigrated men filled in questionnaires, and two cooperative wives of refusers filled in questionnaires on behalf of their husbands, in at least one case with the husband's collaboration and assistance. Therefore, interviews or questionnaires were obtained for 378 of the 403 men still alive (94%).

In general, success in tracing the men was achieved by persistence and by using a wide variety of different methods (Farrington *et al.*, 1990a). Searching in electoral registers and telephone directories, and visits to a man's presumed address, were the most successful tracing methods for the men who were not particularly elusive. Searches in the Criminal Record Office, National Health Service records, and leads from other men were the most useful for the more elusive persons. The key factor in obtaining the men's cooperation was probably the pleasantness of the interviewer in the first face-to-face meeting.

Key Features

Summarizing, the Cambridge Study in Delinquent Development has a unique combination of features. Nine face-to-face interviews have been completed with the males over a 40-year period, from 1961 to 2001. The attrition rate has been unusually low for such a long-term survey. The main focus of interest is on crime and delinquency, but the survey also provides information about alcohol and drug abuse, educational difficulties, poverty and poor housing, sexual behavior, unemployment and other social problems. The sample size of about 400 is large enough for many statistical analyses, but small enough to permit detailed case histories of the males and their families.

Information has been obtained from multiple sources, including the males themselves, their parents, teachers, peers, and official (criminal, hospital and school) records. Generally, the data came from parents, teachers, peers or tests completed by the males between ages 8 and 14, but primarily from interviews with the males between ages 16 and 46. Information has been collected about a wide variety of theoretical constructs at different ages, including biological (e.g. heart rate, height, weight), psychological (e.g. intelligence, impulsivity), family (e.g. parental supervision and discipline), and social (e.g. poor housing, socioeconomic status) factors. Hence, the relative importance of these different factors as predictors and correlates of offending can be investigated. So far, analyses of interview data extend up to age 32, while analyses of criminal records extend up to age 40. As mentioned, the interviews at age 46 are currently (in 2001) under way.

CRIMINAL CAREERS

Natural History of Offending

As mentioned, 40% of the Study males were convicted of criminal offenses up to age 40. The comparable national prevalence of convictions of males in England and Wales born in 1953 up to age 40 is 31% (Prime *et al.*, 2001). The prevalence of offending increased up to age 17 and then decreased. Many other projects show a similar age-crime curve for

prevalence (Farrington, 1986a). While the peak age for the number of offenders was 17, the mean age of convictions was 21, showing the skewness of the age-crime curve (Farrington *et al.*, 1998).

The peak age of increase in the prevalence of offending was 14, while the peak age of decrease was 23 (Farrington, 1990a). These times of maximum acceleration and deceleration in prevalence draw attention to periods in male lives when important life changes may be occurring that influence offending. Perhaps the most important social influence changes from parents to male peers around age 14 and from male peers to female partners around age 23.

Up to age 40, the mean age of onset (the first conviction) was 18.6, while the mean age of desistance (the last conviction) was 25.7. Hence, the average duration of criminal careers was 7.1 years. The average frequency of offending (per offender) was 4.6 crimes. Excluding one-time offenders, whose duration was zero, the average duration of criminal careers was 10.4 years (Farrington *et al.*, 1998). The average time interval between convictions was 3.3 years. The distribution of average time intervals was highly skewed, with about half of the Study males having an average time interval of less than 2 years.

Offending by Family Members

Farrington *et al.* (1998) summarized the conviction careers not only of the Study males but also of their brothers, sisters, fathers, mothers, and wives or female partners. Generally, criminal careers of the Study males' generation (all followed up to age 39-40) were quite similar, although females incurred fewer convictions (average convictions per offender 2.3 for wives, 2.8 for sisters, 4.4 for brothers, 4.6 for Study males). The average age of conviction was similar (21-22) for Study males, brothers, sisters and wives. The peak age of conviction was 2-3 years later for sisters and wives (19-20) than for Study males and brothers (17). The average age of onset was about 2 years later for sisters and wives (20-21) than for Study males and brothers (18-19). The average age of desistance was about one year earlier for sisters and wives (24-25) than for Study males and brothers (25-26).

Excluding one-time offenders, the average duration of criminal careers was 2-3 years longer for Study males and brothers (10-11 years) than for sisters and wives (8 years).

The conviction careers of fathers and mothers (up to an average age of 70) were very different, however (Farrington *et al.*, 1998). Contrary to the view that offending is heavily concentrated in the teenage years, the average age of conviction was 30 for fathers and 35 for mothers. Contrary to the view that most people who are going to offend begin before age 20, the average age of onset was 27 for fathers and 33 for mothers. One-quarter of convicted fathers did not start offending until after age 35, and one-quarter of convicted mothers did not start offending until after age 42. Contrary to the view that most offenders “grow out” of crime in their twenties, the average age of desistance was 36 for convicted fathers and 38 for convicted mothers. One-quarter of convicted fathers did not stop offending until after age 45, and one-quarter of convicted mothers did not stop offending until after age 48. Contrary to the view that criminal careers are relatively short, their average duration (excluding one-time offenders) was 16 years for fathers and 15 years for mothers. Hence, when complete criminal careers are studied, officially recorded offending is far more persistent than previously thought.

Persistence in Offending

There was significant continuity between offending in one age range and offending in another. For example, nearly three-quarters (73%) of males convicted as juveniles at age 10-16 were reconvicted between ages 17 and 24, in comparison with only 16% of those not convicted as juveniles (Farrington, 1992a). Nearly half (45%) of the juvenile offenders were convicted between ages 25 and 32, in comparison with only 8% of those not convicted as juveniles. Other studies show similar continuity in offending (e.g. Krohn *et al.*, 2001; Stattin & Magnusson, 1991).

While offenders were persistent, there was little specialization in offending. For example, 55 of the 65 males with a conviction for violence also had a conviction for a non-violent crime (Farrington, 1997c). To a large extent, the frequent offenders were versatile

and sooner or later committed a violent offense. The probability of committing a violent offense increased steadily with the number of offenses committed, from 18% of one-time offenders to 82% of those with 12 or more convictions (Farrington, 1997c). The data fitted a model specifying that violent crimes occurred at random in criminal careers (Farrington, 1991b).

The probability of persistence in offending increased steadily after each conviction. For the Study males, this probability was .68 after the first conviction, and it increased to .91 after the eighth conviction (Farrington *et al.*, 1998). These results have been replicated in many other studies (e.g. Blumstein *et al.*, 1985; Tarling, 1993; Wolfgang *et al.*, 1972). National English data for males born in 1953 shows that the probability of persistence increased from .51 after the first conviction to .87 after the eighth (Prime *et al.*, 2001). These national probabilities are lower than those in the Cambridge Study because of differences in the definition of what was a conviction. In the Cambridge Study, each offense committed on a different day counted as a conviction, whereas in the national study (where dates of offenses were not recorded) each conviction referred to one court appearance.

The "chronic offenders" at age 32 were defined as the 24 men (6% of the sample) who committed half of all officially recorded offenses (Farrington & West, 1993). Many other projects have reported a similar proportion of chronic offenders (e.g. Tracy *et al.*, 1990). The chronics had each committed at least 9 officially recorded offenses, and they had especially long criminal careers characterized by high rates of offending. They were versatile rather than specialized offenders; 16 of the 24 committed at least five different types of offenses (out of 10 types altogether). They also accounted for substantial proportions of the self-reported offenses (discussed later). For example, between ages 15 and 18, the chronic offenders committed 53% of all self-reported burglaries and 48% of all self-reported thefts of vehicles. Because they are so few and account for so much of the crime problem, the chronics are important targets for prevention and treatment.

The males first convicted at the earliest ages tended to become the most persistent offenders, in committing large numbers of offenses at high rates over long time periods. For example, the 35 males first convicted at age 10-13 averaged 8.8 convictions each up to age 40, with an average career duration of 11.6 years (Farrington *et al.*, 1998). Similar results were obtained for other family members and by many other researchers (e.g. LeBlanc & Frechette, 1989; Tolan & Thomas, 1995). Moffitt (1993) suggested that the “life-course-persistent” offenders, who began early, were different in kind from the “adolescence-limited” offenders who began later and had short criminal careers. These groups were identified using conviction records in the Cambridge Study (Nagin *et al.*, 1995). However, according to self-reports, the apparent reformation of the adolescence-limited offenders was less than complete. At age 32, they continued to drink heavily, use drugs, get into fights and commit undetected offenses.

Replication of Criminal Career Results

Farrington and Wikström (1994) investigated how far the criminal career results (up to age 25) in the Cambridge Study were replicated in Project Metropolitan in Stockholm (focussing on working class boys). Convictions in London were compared with police-recorded offenses in Stockholm. Nevertheless, the cumulative prevalence curves were remarkably similar, as were the age of onset curves, average career durations, measures of continuity in offending and the growth in recidivism probabilities after each offense. In both London and Stockholm, an early onset predicted a long criminal career.

The main differences between the results occurred because there were many more offenses per offender in Stockholm. Whereas 6% of London boys accounted for half of all crimes, only 2% of Stockholm boys accounted for half of all crimes. Also, whereas the average offenses per offender did not vary with age in London, the average offenses per offender increased to a peak in the teenage years and then decreased in Stockholm.

Another replication study, of offending up to age 33, was conducted by Farrington and Maughan (1999). This was a comparison of the Cambridge Study boys with 310 boys born 7

years later and living in the same small area of South London at age 14. The younger birth cohort of London boys was more ethnically diverse. Unlike the Cambridge Study boys, they were subject to police cautioning during their juvenile years, which was intended to divert young people away from court. Nevertheless, the cumulative prevalence of convictions was almost identical in the two studies. Since an additional number of the younger boys had been cautioned, it was concluded that cautioning had widened the net of recorded offenders.

Including cautions, the younger cohort had an earlier age of onset of offending but shorter and less prolific criminal careers. This is understandable if cautioning was bringing in more occasional, less committed offenders. In agreement with this, there was more continuity in offending in the Cambridge Study sample and more chronic offenders.

Co-Offending and Motives

Most juvenile and young adult offenses leading to convictions were committed with others, but the incidence of co-offending declined steadily with age (Reiss & Farrington, 1991). This was not because co-offenders dropped out but because the males changed from co-offending in their teenage years to lone offending in their twenties. Burglary, robbery and theft from vehicles were particularly likely to involve co-offenders.

Generally, there was some consistency in co-offending or lone offending between one offense and the next. Co-offenders tended to be similar in age, gender and race to Study males and lived close to their addresses and to the locations of the offenses. It was rare for Study males to offend with their fathers, mothers, sisters or wives, or with unrelated females. Co-offending with brothers was most likely when a Study male had brothers who were close in age to him.

About one-third of the most persistent offenders continually offended with less criminally experienced co-offenders, and hence appeared to be repeatedly recruiting others into a life of crime. Recruiting was especially common for burglary offenses. The recruiters are prime targets for intervention to reduce offending.

The most common reasons given for property offenses were utilitarian, rational or economic: offenses were committed for material gain (Farrington, 1993c). The next most common category of reasons were hedonistic: for excitement, for enjoyment, or to relieve boredom. Vandalism and joy-riding were mainly committed for these reasons. Similar results were reported in Montreal by LeBlanc and Frechette (1989). Other reasons were designed to minimize the offender's responsibility (e.g. I was young; I was drunk) or to blame peers. Offenses at younger ages (under 17) were relatively more likely to be committed for hedonistic reasons, while offenses at older ages (17 or over) were relatively more likely to be committed for utilitarian reasons.

Reasons for physical fighting depended on whether the boy was alone or in a group (Farrington *et al.*, 1982a). In individual fights, the boy was usually provoked, became angry, and hit out to hurt his opponent. In group fights, the boy often said that he became involved to help a friend or because he was attacked. The group fights were more serious, occurring in bars or streets, and they were more likely to involve weapons, produce injuries, and lead to police intervention. Fights often occurred when minor incidents escalated, because both sides wanted to demonstrate their toughness and masculinity and were unwilling to react in a conciliatory way.

Self-Reported Offending

Most criminal career results reported so far were based on convictions. However, as mentioned, self-reports of offending were obtained at every age from 14 onwards. Compared with convictions, it is to be expected that self-reports will indicate a higher prevalence and frequency of offending, an earlier age of onset and a later age of desistance. The cumulative prevalence of self-reported offending was very high; up to age 32, 96% of males admitted committing at least one crime that could, in theory, have led to a conviction. Hence, at least in this sample of urban working-class males, offending was not statistically deviant, although it was less common to commit relatively serious offenses such

as burglary. Only 22% of males admitted burglary, and only 14% were convicted of burglary, up to age 32 (Farrington, 1989c).

According to repeated self-reports, the most common crimes of burglary, shoplifting, theft of and from vehicles, and vandalism declined in prevalence from the teenage years to the twenties and thirties, but the same decreases were not found for theft from work, assault, drug abuse and fraud (Farrington, 1989c). Interestingly, the degree of continuity and specialization in offending was very similar according to self-reports and convictions.

To a considerable extent, the self-reports and official records identified the same people as the worst offenders, as other researchers have also found (e.g. Huizinga & Elliott, 1986). The 80 boys who admitted the highest number of delinquent acts when seen at ages 14 and 16 overlapped significantly with the 85 convicted juvenile delinquents, since 41 boys were in both groups (West & Farrington, 1973). Consequently, conclusions about characteristics of offenders based on convictions were generally similar to conclusions based on self-reported offending.

The relationship between self-reported offending and convictions was strongest for burglary and for theft of and from vehicles, but it was also significant for shoplifting, theft from machines, assault, and drug use (Farrington, 1989c). The two measures were not significantly related for theft from work, vandalism, and fraud, because of the low probability of an offender being convicted for these offenses. When data were cumulated over the whole period between ages 10 and 32, the probability of an offender being convicted (sooner or later) was quite high for several types of offenses: over 50% for burglary and theft of vehicles, and 25% for theft from vehicles. The probability of an offender being convicted increased with age.

Several methodological studies of self-reported delinquency were carried out. In particular, the first demonstration of predictive validity -- that self-reported delinquency by unconvicted boys predicted later convictions -- was published by Farrington (1973). A later

test (Farrington, 1989c) showed that this was true for particular types of offenses: burglary, theft of and from vehicles, and drug use (but not for shoplifting).

Another important comparison was between prospective self-reports of offending (at ages 14, 18, 21 and 25) and long-term retrospective self-reports of offending at age 32 (in response to the question "Have you ever done X?"). About half of all offenses admitted prospectively were denied retrospectively (Farrington, 1989c). This suggests that valid self-report information about criminal careers requires repeated questions in prospective longitudinal surveys and cannot be obtained retrospectively in a cross-sectional survey.

Mathematical Models of Criminal Careers

Barnett *et al.* (1987) tested several mathematical models of the conviction careers of the Study males, restricting the analysis to those with two or more convictions. They found that models assuming that all offenders had the same frequency of offending were inadequate. In order to fit the data, they assumed that there were two categories of offenders, termed "frequent" and "occasional", who differed both in their rates of offending and in their probabilities of desistance after each conviction. Both types incurred convictions at a constant (but different) rate during their criminal careers. The two types had a similar average career duration.

Barnett *et al.* (1989) also carried out a predictive test of this model. The model was developed on conviction data between the 10th and 25th birthdays and aimed to predict reconviction data between the 25th and 30th birthdays. Generally, the model performed well, but it was necessary to assume that there was some intermittency (desisting and later restarting) of criminal careers. Some of the frequent offenders ceased offending at an average age of 19 but then restarted after a period of 7-10 years with no convictions. This restarting may be connected to life changes such as losing a job or separating from a spouse (see later).

Nagin and Farrington (1992b) articulated two alternative reasons for the continuity between past and future offending. The first is that it reflects a stable underlying construct such as criminal potential; this was termed the "persistent heterogeneity" explanation. The

second is that the commission of one crime leads to an increase in the probability of committing future crimes, perhaps because of reinforcement or stigmatization; this was termed the “state dependence” explanation. Because past convictions did not predict future convictions independently of age and background factors, the persistent heterogeneity argument was supported. In other words, the continuity between past and future convictions reflected continuity in an underlying criminal potential. Similar conclusions were reached by Paternoster *et al.* (2001), arguing that later life events have minimal effects on this continuity.

Nagin and Farrington (1992a) tested similar explanations of why an early age of onset predicts a long criminal career and a large number of offenses. This can occur either because an early age of onset is one symptom of a high criminal potential, which later shows itself in persistent offending, or because an early age of onset in some way facilitates later offending (e.g. because of early reinforcement or early stigmatization). The data showed that the inverse relationship between age of onset and persistence of offending was entirely attributable to the persistence of a previously existing criminal potential, and that an early age of onset had no additional impact on persistence.

RISK FACTORS FOR OFFENDING

Childhood Risk Factors

Before anyone was convicted, at age 8-10, the future convicted juvenile delinquents differed significantly from the nondelinquents in many respects (self-reported delinquency will be discussed later). For example, the future convicted juvenile delinquents were more likely than nondelinquents to have been rated troublesome and dishonest in their primary schools. Convicted delinquents tended to be from poorer families, from larger-sized families, living in poor houses with neglected interiors, supported by social agencies, and physically neglected (in clothing, hygiene or food) by their parents. However, they did not significantly tend to come from low socioeconomic status families (as measured by the occupational prestige of the family breadwinner) or to have working mothers. The delinquents were more likely to have convicted parents and delinquent older siblings (see later). They tended to be

receiving poor parental child-rearing behavior, characterized by harsh or erratic parental discipline, cruel, passive, or neglecting parental attitude, and parental conflict. Their parents tended to supervise them poorly, being lax in enforcing rules or under-vigilant (West & Farrington, 1973; Farrington, 1992c).

Up to the 10th birthday, the future juvenile delinquents were more likely to have experienced broken homes or separations from their parents for reasons other than death or hospitalization. Their parents tended to be uncooperative towards the research, endorsed authoritarian child-rearing attitudes on questionnaires, and were uninterested in the boy's education. Their mothers tended to be nervous or in poor physical health, while their fathers tended to have erratic job histories, including periods of unemployment. The boys who became delinquents were more likely to have low intelligence and low school achievement and to be rated as daring (taking many risks) by parents and peers. The boys' teachers said that they were hyperactive and had poor concentration. Interestingly, hyperactivity at age 8-10 predicted juvenile convictions independently of conduct problems at age 8-10 (Farrington *et al.*, 1990b). Delinquents tended to be impulsive on psychomotor tests and personality questionnaires and unpopular with their peers, but they were not nervous. They were likely to have below-average height and average weight (West & Farrington, 1973; Farrington, 1992c).

Similar results have been reported by many other researchers (see e.g. Farrington, 1999a, 2001c). It seems likely that early risk factors for offending are largely replicable over time and place. Farrington and Loeber (1999) systematically compared childhood risk factors for court delinquency in the Cambridge Study and in the Pittsburgh Youth Study (see the chapter by Loeber *et al.*). Replicable risk factors included hyperactivity, impulsivity and poor concentration; low school achievement; poor parental supervision; parental conflict; an antisocial parent; a young mother; large family size; low family income; and coming from a broken family. It was interesting that these risk factors were replicable despite considerable social differences between London in the early 1960s and Pittsburgh in the late 1980s. For

example, family size was greater in London and broken families and young mothers were more prevalent in Pittsburgh.

Where there were differences in results, these seemed largely attributable to different meanings of the risk factors. For example, maternal physical punishment was more important as a risk factor for delinquency in London, and socioeconomic status was more important in Pittsburgh. However, maternal physical punishment included a cold, rejecting attitude in London, but it could be given in the context of a loving relationship in Pittsburgh; and socioeconomic status in Pittsburgh included parental education, whereas in London it reflected only occupational prestige. (An earlier comparison of personality factors in the Cambridge Study and in a Montreal longitudinal study of adolescents was also completed by Farrington *et al.*, 1982b.)

At age 14, when the boys were in their last year of compulsory schooling, the differences between juvenile delinquents and nondelinquents were similar in many respects to those found at age 8-10. For example, the convicted delinquents still tended to have cruel, passive, or neglecting parents who were in conflict with each other, and they were still significantly low on measures of intelligence and attainment. They were described by their teachers as frequent liars, truants, daring, lacking in concentration or restless, and they left school at the earliest possible age of 15. Special efforts were made at age 14 to measure aggressiveness, and the delinquents proved to be significantly aggressive according to self-reports, teacher ratings, and a semantic differential test. Also, the delinquents were likely to have relatively many delinquent friends (West & Farrington, 1973; Farrington, 1992c), as other researchers have found (e.g. Elliott *et al.*, 1985).

Mechanisms and Processes

Several attempts have been made to go beyond the identification of risk factors in multivariate analyses and to test alternative theories about mechanisms and processes relating risk factors and offending. For example, the concentration of offending in a small number of families was remarkable in the Cambridge Study. Less than 6% of the families

were responsible for half of the convictions of all family members (fathers, mothers, sons and daughters) of all 400 families (Farrington *et al.*, 1996). Having a convicted father, mother, brother or sister significantly predicted a boy's own convictions. In fact, having a convicted parent before the 10th birthday was usually the best explanatory predictor of the boy's later offending and antisocial behavior, and it continued to be predictive after controlling for all other explanatory variables.

The design of the Cambridge Study does not permit any disentangling of genetic and environmental transmission of antisocial behavior from parents to children. However, West and Farrington (1977) did test various hypotheses about the link between convicted fathers and convicted sons. For example, the percentage of males who were convicted did not vary according to whether the father was last convicted before or after the boy's birth, suggesting that there was no direct behavioral influence of criminal fathers on delinquent sons. There was no evidence that convicted fathers directly encouraged their sons to commit crimes or taught them criminal techniques. On the contrary, convicted fathers condemned their sons' offending. Hardly any convicted fathers co-offended with any of the Study males (Reiss & Farrington, 1991).

Convicted fathers were significantly likely to be married to convicted mothers, but a convicted father predicted the boy's offending even when no other family member was convicted. The influence of a convicted father did not vary according to the extent of his criminal record. Convicted fathers had no more effect on older sons than on younger sons, again casting doubt on the importance of direct environmental influence (on the assumption that the older sons, on average, would have spent more time with their fathers).

Convicted fathers also predicted self-reported offending by the Study male. However, at all levels of self-reported offending (even at low levels), a convicted father predicted an increased likelihood of the boy being convicted. This suggests that a boy from a known criminal family who was apprehended for offending might have been more likely to be convicted than an equally delinquent boy from a noncriminal family. A convicted father was

especially associated with poor parental supervision, and this was not because of imprisonment (which was rare). Poor parental supervision may be one link in the causal chain between convicted fathers and convicted sons.

As another example, Juby and Farrington (2001) tested different explanations of the relationship between disrupted families and delinquency. Trauma theories suggest that the loss of a parent has a damaging effect on a child, most commonly because of the effect on attachment to the parent. Life course theories focus on separation as a sequence of stressful experiences, and on the effects of multiple stressors such as parental conflict, parental loss, reduced economic circumstances, changes in parent figures and poor child-rearing methods. Selection theories argue that disrupted families produce delinquent children because of pre-existing differences from other families in risk factors such as parental conflict, criminal or antisocial parents, low family income or poor child-rearing methods.

Juby and Farrington (2001) concluded that the results favored life course theories rather than trauma or selection theories. While boys from broken homes (permanently disrupted families) were more delinquent than boys from intact homes, they were not more delinquent than boys from intact high conflict families. Overall, the most important factor was the post-disruption trajectory. Boys who remained with their mother after the separation had the same delinquency rate as boys from intact low conflict families. Boys who remained with their father, with relatives or with others (e.g. foster parents) had high delinquency rates. The results were similar whether convictions or self-reported delinquency were studied.

Independent Predictors

In order to draw conclusions about possible causal effects, a risk factor should precede the outcome variable of offending, it should significantly predict the outcome variable, and it should predict the outcome variable after controlling for other possible explanatory variables. These considerations drove most of the multivariate analyses, which usually involved regression techniques to investigate the independent predictive effects of

risk factors on outcomes. Sometimes, successive regressions were carried out. For example, in building up a model of stepping stones to adult criminal careers, Farrington (1986b) studied the independent predictors of (a) troublesomeness at 8-10, (b) convictions at 10-13, (c) convictions at 14-16, (d) convictions at 17-20, and (e) convictions at 21-24. In other cases, hierarchical regressions were carried out, entering variables in different categories as blocks (e.g. Farrington & Loeber, 1999).

A fundamental distinction was made between explanatory and nonexplanatory risk factors. An explanatory risk factor was one that measured some underlying theoretical construct that was clearly different from the construct measured by the outcome variable. Thus, the construct measured by poor parental supervision is clearly different from the construct measured by offending, and is plausible to suggest that poor parental supervision could cause child offending. A nonexplanatory risk factor was one that arguably measured the same underlying construct as offending. Thus, it was considered that troublesome child behavior probably predicted later offending because both were measuring an underlying antisocial personality that persisted from childhood to adulthood with different behavioral manifestations at different ages (e.g. truancy, bullying, heavy drinking, drug use). It would not be sensible to suggest that troublesome child behavior caused offending. Heavy drinking may be an immediate situational trigger to offending, but it is not an explanatory risk factor in the sense that this term is used here.

A major problem of interpretation centers on delinquent friends. Having delinquent friends at age 14 (when it was first measured) clearly predicted later offending of the Study male. However, because most offenses under age 17 were committed with other young males, if a Study male offended then in most cases he inevitably had to have delinquent friends. Amdur (1989, p.51) argued that delinquent friends and delinquency could be measuring the same underlying construct. Arguably, having delinquent friends was merely another indicator of offending and hence should not be treated as an explanatory predictor; delinquent friends may have predicted offending because of the continuity in offending over

time. Explanatory analyses were based only on clearly explanatory risk factors, whereas analyses to investigate the accuracy of prediction were based on all (explanatory and nonexplanatory) risk factors.

In the analyses, the large number of possible explanatory variables was reduced to a small number (about 20 at age 8-10) that each seemed to measure a distinct theoretical construct and that were not highly correlated. Further reduction would have required the combination of different constructs. For example, a global measure of poor parenting could have been derived including discipline, supervision, conflict, disrupted families and convicted parents, but it was thought that each of these constructs was potentially important and that a combined scale would be less meaningful. In general, all explanatory risk factors were always included in explanatory analyses, as it was considered problematic to demonstrate (for example) that X predicted offending independently of three possible confounders A, B and C, when there are so many more plausible explanatory variables measured in the Study. Results may differ in neat modelling exercises based on a few variables compared with regression analyses based on many variables (e.g. Rowe & Farrington, 1997).

In many analyses, explanatory variables were dichotomized. Dichotomized variables are more concordant with the idea of “risk factors”, make it very easy to communicate results to policy makers and practitioners, can be easily added to produce risk scores and identify multiple problem youth, and make it easy to study interactions between variables (see later). Dichotomization makes it possible to use the odds ratio, which is a more meaningful, interpretable and realistic measure of strength of association than the product-moment correlation and the percentage of variance explained. Dichotomization equates the sensitivity of measurement of all variables and hence makes it possible to compare their predictive efficiency, and also makes it possible to study nonlinear relationships (e.g. where there is a large increase in delinquency in the “worst” category of an explanatory variable). The main disadvantage with dichotomization is that information is lost, because cases below the threshold are treated as equivalent. Overall, however, it was considered that the

advantages outweighed the disadvantages for many analyses (see Farrington & Loeber, 2000).

The most important predictors, at age 8-10, of later offending (whether measured by convictions or by self-reports) fell into 6 categories of theoretical constructs:

1. Antisocial child behavior, including troublesomeness, dishonesty and aggressiveness;
2. Hyperactivity-impulsivity-attention deficit, including poor concentration, restlessness, high daring (risk -taking) and psychomotor impulsivity;
3. Low intelligence and low school achievement;
4. Family criminality, including convicted parents, delinquent older siblings, and siblings with behavior problems;
5. Family poverty, including low family income, large family size, and poor housing;
6. Poor parenting, including harsh and authoritarian discipline, poor supervision, parental conflict and separation from parents.

In regression analyses, it was often found that one factor from each of the categories predicted offending independently of all the other categories.

At age 8-10, the best independent predictors of official juvenile delinquency (convictions between ages 10 and 16) were troublesomeness, high daring, dishonesty, a behavior problem sibling, a convicted parent, and poor parental child-rearing behavior (Farrington, 1996a). When measures of antisocial child behavior were excluded from the regression analysis in order to investigate explanatory factors only, the best independent predictors were high daring, low school achievement, a convicted parent, harsh discipline, low nonverbal intelligence and separation from a parent (Farrington & Loeber, 1999).

The best independent predictors of convictions up to age 32 were troublesomeness, a convicted parent, high daring, low junior school achievement, poor housing and separation from a parent (Farrington, 1990b). Excluding measures of antisocial child behavior, the best independent predictors of convictions up to age 32 were large family size, a convicted

parent, high daring, poor housing, separation from a parent, low school achievement and not having few friends (Farrington, 1993a); social isolation seemed to act as a protective factor against delinquency (see later). The best explanatory predictors at age 8-10 of adult convictions between ages 21 and 40 were low school achievement, a convicted parent, separation from a parent and large family size (Farrington, 2000b).

Generally, the best predictors of convictions tended also to be the best predictors of the worst self-reported offenders (those who admitted the most acts). For example, of 39 key risk factors measured between ages 8 and 18, 35 were significantly related to both official and self-reported delinquency (Farrington, 1992c, Table 6.1). The only exceptions were that official (but not self-reported) delinquents were attending high delinquency rate schools and were relatively small at ages 8-10 and 18, while self-reported (but not official) delinquents tended to come from low socioeconomic status families at age 8-10.

Predicting Persisters

Farrington (1999b) compared the predictors at age 8-10 of persistent young offenders (those with 3 or more convictions between ages 10 and 18) and of occasional offenders (those with one or two convictions). The best independent predictors of occasional offenders (compared with unconvicted boys) were a convicted parent, high daring, unpopularity and poor housing. The best predictors of persistent offenders (compared with occasional offenders) were different: low family income, poor concentration, low involvement of the father in the boy's leisure activities, low socioeconomic status, and a delinquent sibling. Therefore, predictors of persistence may be different from predictors of onset.

Persistence in crime after the 21st birthday, as opposed to desistance, was predicted especially by heavy drinking at age 18 and by having a father who rarely joined in the boy's leisure activities at age 12, as well as by unemployment at age 16, low verbal intelligence at age 8-10 and not trying to do well at school (Farrington & Hawkins, 1991). Convicted teenagers who were both unemployed and heavy drinkers had an exceptionally

high probability of persistence (nearly 90%). Again, the predictors of persistence were different from the predictors of early onset, as other researchers have found (e.g. Loeber *et al.*, 1991). The best independent predictors at age 8-10 of the chronic offenders up to age 32 were troublesomeness, a delinquent sibling, high daring and a convicted parent (Farrington & West, 1993).

OFFENDING AND ANTISOCIAL BEHAVIOR

Antisocial Behavior at age 18

The Cambridge Study shows that offending is only one element of a much larger syndrome of antisocial behavior that tends to persist over time, as Robins (1986) has persuasively argued. For example, the boys who were convicted up to age 18 (most commonly for offenses of dishonesty, such as burglary and theft) were significantly more deviant than the nonoffenders on almost every factor that was investigated at that age (West & Farrington, 1977). The convicted delinquents drank more beer, they got drunk more often, and they were more likely to say that drink made them violent. They smoked more cigarettes, they had started smoking at an earlier age, and they were more likely to be heavy gamblers. They were more likely to have been convicted for minor motoring offenses, to have driven after drinking at least 10 units of alcohol (e.g. 5 pints of beer), and to have been injured in road accidents. The delinquents were more likely to have taken prohibited drugs such as marijuana or LSD, although few of them had convictions for drug offenses. Also, they were more likely to have had sexual intercourse, especially with a variety of different girls, and especially beginning at an early age, but they were less likely to use contraceptives.

The convicted delinquents at age 18 tended to hold relatively well paid but low status jobs, and they were more likely to have erratic work histories including periods of unemployment. They were more likely to be living away from home, and they tended not to get on well with their parents. They were more likely to be tattooed, and they had significantly low heart rates. The delinquents were more likely to go out in the evenings, and

were especially likely to spend time hanging about on the street. They tended to go around in groups of four or more, and were more likely to be involved in group violence or vandalism. They were much more likely to have been involved in physical fights, to have started fights, to have carried weapons, and to have used weapons in fights. They were also more likely to express aggressive and anti-establishment attitudes on a questionnaire (negative to police, school, rich people and civil servants).

It was interesting that the peak age of offending, at 17-18, coincided with the peak age of affluence for many convicted males. Convicted males tended to come from low income families at age 8 and later tended to have low incomes themselves at age 32. However, at age 18, they were relatively well paid in comparison with nondelinquents; whereas convicted delinquents might be working as unskilled laborers on building sites and getting the full adult wage for this job, nondelinquents might be in poorly-paid jobs with prospects, such as bank clerks, or might still be students. These results show that the link between income and offending is quite complex.

Antisocial Behavior at age 32

Generally, the Study males were less antisocial at age 32 than at age 18. Most types of offending declined with age, although binge drinking, drunk driving and the use of hard drugs (heroin and cocaine) increased (Farrington, 1990a). While the Study males became less deviant in absolute terms, those who were relatively more deviant at age 18 still tended to be relatively more deviant at age 32. Therefore, there was relative stability but absolute change. Between ages 18 and 32, there was a decrease in aggressive and anti-establishment attitudes and in self-reported impulsivity. Most of the men (76%) were living with a wife or female partner at age 32, and their job records had become much more stable. These two factors of settling down with female partners and in stable jobs seemed most plausible in explaining the decrease in offending (see later).

Convicted men differed significantly from unconvicted ones at age 32 in most aspects of their lives (Farrington, 1989b). Convicted men were less likely to be home owners and

more likely to be renting (usually from the local council), more likely to have moved home frequently, more likely to be divorced or separated, to be in conflict with their wife or female partner and to have assaulted her, and more likely to be separated from a child. Convicted men were more likely to be unemployed, had low take-home pay, spent more evenings out per week, were more likely to be involved in physical fights, heavy smokers, heavy drinkers, drunk drivers, drug users and self-reported offenders. Also, convicted men were more likely to be identified as probable psychiatric cases on the General Health Questionnaire (Goldberg, 1978), which detects anxiety-depressive types of mental illness, but this was a relatively weak relationship.

Generally, the convicted men who were persisters (those convicted both before and after their 21st birthdays) were more deviant than desisters (those convicted only before their 21st birthdays) or late-comers to crime (those convicted only after their 21st birthdays). For example, adult social dysfunction at age 32 was assessed on a 9-point scale including quality of accommodation, cohabitation history, success with children, employment history, physical fighting, substance abuse, psychiatric disorder, and self-reported and official offending in the previous five years (Farrington *et al.*, 1988b). A similar composite measure was developed by Zoccolillo *et al.* (1992). While 87% of unconvicted men were living quite successful lives according to this composite measure, this was true of 67% of desisters, 59% of late-comers and only 44% of persisters (Farrington, 1989b). Even at age 32, the persisters tended to be significantly deviant in a variety of ways.

The Antisocial Personality Syndrome

In order to investigate the syndrome of antisocial behavior, composite measures of "antisocial personality" were devised at ages 10, 14, 18 and 32, based on indicators of deviant behavior at each age (Farrington, 1991a). For example, the measure of antisocial personality at age 18 included conviction, self-reported delinquency, self-reported violence, antisocial group behavior, taking a prohibited drug, heavy smoking, heavy drinking, drunk driving, irresponsible sex (having intercourse without using contraceptives), heavy gambling,

an unstable job record, anti-establishment attitudes, being tattooed, and self-reported impulsivity (all referring to the 15-18 age range).

The antisociality scales at the four ages were all significantly intercorrelated, showing the continuity in antisocial behavior over time. For example, the scales at ages 18 and 32 correlated .55, despite the dramatic environmental changes in people's lives between these ages, as they left the parental home, went through a period of residential instability and then typically settled down with a wife or female cohabitee. Hence, the high correlation probably reflects individual rather than environmental stability. Over half (60%) of the most antisocial males at age 18 were still antisocial at age 32, compared with only 14% of the remainder at age 18 who became antisocial at age 32.

The most important predictors of antisocial personality at each age were investigated (Farrington, 1996b, 2000b). For example, the best explanatory predictors at age 8-10 of antisociality at age 18 were a convicted parent, large family size, a nervous mother, high neuroticism, poor child-rearing and low school achievement. The best explanatory predictors of antisociality at age 32 were a convicted parent, large family size, a young mother, and low nonverbal intelligence. Since low school achievement and low nonverbal intelligence were highly correlated, the best predictors of antisociality at ages 18 and 32 were very similar.

Numerous factors predicted adult social dysfunction at age 32, but the best independent predictors (at age 18) were a poor relationship with the parents at age 18, an unskilled manual job at age 18, no examinations taken by age 18, nervous-withdrawn at age 8, small at age 14, hospital treatment for illness at age 16-18, poor concentration or restlessness at age 12-14 and high neuroticism at age 14 (Farrington, 1993a). Nervousness seemed to be negatively related to offending but positively related to other types of social dysfunction.

Truancy and Physical Health

Research on truancy (Farrington, 1980, 1996a) showed that primary school truants at age 8-10 tended to become secondary school truants at age 12-14. The best independent predictors at age 8-10 of secondary school truancy were troublesomeness, a behavior problem sibling, a nervous or psychiatrically treated father, low nonverbal intelligence, separation from a parent, low parental interest in the boy's education, low school attainment and daring. Generally, truants and delinquents were similar in childhood, adolescent and adult features, but the most important difference was that nervousness was positively related to truancy but negatively related to delinquency. This suggested that, for some children, truancy was a behavioral symptom of a nervous-withdrawn temperament rather than of an antisocial personality, thus confirming the distinction between truancy and school refusal (Bools *et al.*, 1990).

Convicted males significantly tended to have accidents and injuries at ages 18 and 32 (Farrington, 1995a). However, convictions were only weakly related to hospital treatment for illness. Generally, convictions and self-reported offending predicted hospital treatment for injury and illness more than the reverse. All these predictive relationships held independently of antisocial personality and childhood risk factors. It was concluded that offending could lead to poor health.

AGGRESSION AND VIOLENCE

Continuity in Aggression

There was significant continuity between childhood aggression and adult violence (Farrington, 1989a, 1991b), as other researchers have also reported (e.g. Eron & Huesmann, 1990). Boys who were aggressive in childhood or adolescence tended to be more deviant in adulthood: living in worse home circumstances, more in conflict with and violent towards their wife or female partner, more likely to be unemployed, heavier smokers and drinkers, more likely to be drunk drivers and drug takers, and committing more offenses (including violence). This continuity, however, was probably not specific to

aggression and violence but was part of the general continuity in antisocial and deviant behavior from childhood to adulthood. This was why aggressive children had deviant life styles 20 years later as adults.

Research on bullying (Farrington, 1993d) shows continuity both within and between generations. There was a significant tendency for the males who reported that they were bullies at age 14 also to report that they were bullies at age 32 and that their children were bullies when the males were age 32. In addition to being bullies themselves, the men who had children who were bullies tended to be poor readers, heavy gamblers and unpopular in their teenage years, and they tended to have authoritarian parents. The men were also asked at age 32 about whether their children were victims of bullying. Those who had children who were victims tended to be those who had been unpopular and had few friends at age 8-10, and those who were nervous and regular smokers at age 14. Knowing that these factors are associated with being bullied, it seemed likely that there was intergenerational continuity in being bullied as well as in bullying (see also Olweus, 1994).

Predictors of Aggression and Violence

The most important predictors of adolescent aggression and adult violence tended to fall into the categories listed earlier (Farrington, 1978, 1989a, 1998, 2000a, 2001a). For example, the best explanatory predictors at age 8-10 of convictions and self-reported violence up to age 20 were high daring, poor parental supervision, low family income, large family size, physical neglect and a convicted parent. The best predictors of violence after age 21 were a convicted parent, separation from a parent, low socioeconomic status, low family income and a young mother.

Conclusions drawn from these predictive analyses of aggression and violence were similar to those drawn about the prediction of delinquency and frequent offending. This further confirmed the argument put forward by West and Farrington (1977) that aggression was merely one element of a more general antisocial tendency, which arose in childhood and continued through the teenage and adult years. Violent offenders were very similar to

nonviolent frequent offenders in childhood, adolescent, and adult features (Farrington, 1991b), suggesting that the causes of aggression and violence were essentially the same as the causes of persistent and extreme antisocial, delinquent and criminal behavior. These results were replicated by Capaldi and Patterson (1996).

The predictors of soccer violence at age 18 and violence against spouses and female partners at age 32 were also investigated (Farrington, 1994a). The best predictors at age 15 of soccer violence were being relatively small, having a father who was not interested in the boy, not attending church, not being nervous, leaving school early and having authoritarian parents. The best predictors at age 15 of spouse assault were a convicted parent, unpopularity, high daring, and separation from a parent. There seemed to be a link between experiencing parental disharmony and early separation from a parent in childhood, difficulties in relationships with peers and parents, and later difficulties in relationships with spouses and female partners. Teenage violence tended to develop into later spouse assault, but particularly for those aggressive males who had long-lasting difficulties in their relationships with other people.

Farrington *et al.* (1982a) analyzed physical fights reported by the males at age 15-18 (most occurring in bars or streets). As mentioned, group fights were more serious than individual fights, in involving weapons, injuries and police intervention. A category of aggressive frequent group fighters was identified, and the best predictors at age 8-10 of these boys were low family income, large family size, low verbal intelligence, high daring and low school achievement. The best childhood predictors of bullying were physical neglect, the father not joining in the boy's leisure activities, low school achievement, a convicted parent, and the boy not having few friends (Farrington, 1993d). As mentioned, boys with few friends tend to be victims of bullying, not bullies.

According to Raine (1993, pp. 166-172), one of the most replicable findings in the literature is that antisocial and violent youth tend to have low heart rates. This may be because a low heart rate reflects autonomic under-arousal, which leads to sensation-

seeking, risk-taking and aggression to increase arousal. Alternatively, a high heart rate may be associated with anxiety, behavioral inhibition, and a fearful temperament, and fearful people are unlikely to commit violent acts. Farrington (1997c) carried out extensive analyses on low heart rate as a predictor and correlate of official and self-reported violence and teacher-reported aggression. The relationship between low heart rate and these outcome variables held up after controlling for all other risk factors.

Accuracy of Prediction

Numerous studies of the accuracy of prediction of offending were carried out. For example, Farrington (1997a) investigated how far the “vulnerability” score at age 8-10 predicted violent and nonviolent convictions and self-reported offending up to age 20. This score was derived at an early stage (West & Farrington, 1973, p. 131) and was the number of risk factors out of five (low family income, large family size, a convicted parent, poor parental child-rearing behavior and low nonverbal intelligence). The percentage who became offenders increased with the risk score. For example, the percentage convicted of violence increased from 3% (score 0) to 31% (score 4-5) and the percentage convicted of nonviolent offenses increased from 20% (score 0) to 70% (score 4-5).

Different risk scores were used in predicting convictions for violence and nonviolent offenses and self-reported violence after age 21 (Farrington, 2001a) and in predicting adult convictions after age 21 and antisocial personality at ages 18 and 32 (Farrington, 2000b). For example, 14% of males with no risk factors were convicted after age 21, compared with 64% of males with three or four risk factors at age 8-10 (low school achievement, a convicted parent, separation from a parent, large family size). Farrington (2002) also investigated the prediction at age 8-10 of boys who both had multiple problems and were violent between ages 10 and 20. The percentage who became multiple problem violent boys increased from 1% (score 0) to 83% (score 7-8). These figures overestimate the extent to which multiple problem violent boys could be predicted in a different sample. Nevertheless, it was generally

true that the degree of predictability of later outcomes at age 8-10 was remarkable (even when behavioral predictors such as troublesomeness were excluded).

It was also surprising how accurately chronic offenders (the small number of men who accounted for half of all convictions) could be predicted. For example, a prediction scale was developed at age 8-10 based on troublesome child behavior, economic deprivation, low nonverbal intelligence, a convicted parent, and poor parental child-rearing behavior (Farrington, 1985). Of the 55 boys with the highest scores on this scale, 15 became chronic offenders up to the 25th birthday (out of only 23 in the whole sample), 22 others were convicted, and only 18 were unconvicted at that time. Hence, there were few "false positives".

LIFE EVENTS AND PROTECTIVE FACTORS

Effects of Life Events

An advantage of a longitudinal survey is that it is possible to investigate the effects of specific life events on the development of delinquency, by comparing before and after measures of offending and carrying out quasi-experimental analyses using each subject as his own control (Farrington, 1988). For example, the effects on delinquent behavior of being found guilty in court were studied. If convictions have a deterrent or reformatory effect, a boy's delinquent behavior should decline after he is convicted. On the other hand, if convictions have stigmatizing or contaminating effects, a boy's delinquent behavior should increase after he is convicted.

These hypotheses were tested by studying self-reports of delinquency before and after a boy was first convicted. It was found that boys who were first convicted between ages 14 and 18 increased their self-reported delinquency afterwards, both in comparison with the level before and in comparison with the offending of a carefully matched group of unconvicted boys (Farrington, 1977). The same result was obtained in studying the effect of first convictions occurring between ages 18 and 21 (Farrington *et al.*, 1978). These results

are concordant with Gold's (1970) findings in Michigan. However, self-reported delinquency decreased after later convictions, especially if they were followed by noncustodial sentences.

The effect on delinquency of going to different secondary schools was also investigated (Farrington, 1972). At age 11, most of the boys went to one of 13 secondary schools. These schools differed dramatically in their official delinquency rates, from one which had 20 court appearances per 100 boys per year to another where the corresponding figure was only 0.3. The key issue was whether the boys who went to high delinquency rate secondary schools became more likely to offend as a result, or whether the differing delinquency rates of the different secondary schools merely reflected differences in their intakes of boys at age 11.

As already mentioned, the best predictor of official juvenile delinquency in this survey was the rating of troublesomeness at age 8-10 by teachers and peers. Generally, the continuity between troublesomeness and delinquency was not greatly affected by the kind of school to which a boy went. There was a marked tendency for the more troublesome boys to go to the high delinquency rate secondary schools, and the delinquency rates of different secondary schools largely reflected their different intakes. In contrast to Rutter *et al.* (1979), who found somewhat greater school effects, it was concluded that these secondary schools had little effect on delinquency.

Another investigation of the effect of a specific event on offending focussed on unemployment (Farrington *et al.*, 1986a). The complete job history of each boy between leaving school at an average age of 15 and the interview at age 18 was obtained, including all periods of unemployment. The key question was whether the boys committed more offenses (according to official records) during their periods of unemployment than during their periods of employment.

The results showed that the boys did indeed commit more offenses while unemployed than while employed. Furthermore, the difference was restricted to offenses involving financial gain, such as theft, burglary, robbery, and fraud. There was no effect of

unemployment on other offenses, such as violence, vandalism, and drug use, suggesting that the boys committed more offenses while they were unemployed because they lacked money at these times. Furthermore, the effect of unemployment only applied to those with the highest prediction scores for crime, suggesting that unemployment had a criminogenic effect especially on those boys with the greatest prior potential for offending.

Factors Encouraging Desistance

An important life event that encouraged desistance was moving out of London (West, 1982). Most families who moved out were upwardly mobile families who were moving to prosperous suburban areas in the Home Counties, often buying their own houses rather than renting in London. It was clear that both official and self-reported offending of the men decreased after they and their families moved out of London, possibly because of the effect of the move in breaking up delinquent groups.

It is often believed that marriage to a good woman is one of the best treatments for male offending. When we asked the males in their twenties why they had stopped offending, they often mentioned marriage and the influence of women, as well as the fact that they did not hang around so much with delinquent friends. The Study males were growing up in a time period when men and women who wanted to live together usually got married. The effects of marriage were initially studied by following both convictions and self-reported offending before and after early marriages (up to age 22). While the numbers were small, there was some suggestion that marriage led to a decrease in offending during the following two years, but only for offenders who married unconvicted women. Those who married convicted women continued to offend at the same rate after marriage as matched unmarried offenders (West, 1982). Similarly, the men's fathers who married convicted women incurred more convictions after marriage than those who married unconvicted women, irrespective of their conviction records before marriage.

A more detailed study of marriage up to age 32 (Farrington & West, 1995) showed that, while convicted offenders were no more or less likely than nonoffenders to get married,

offenders were more likely to separate from their wife and to conceive a child while unmarried. Regression analyses showed that separation from a wife predicted later self-reported and official offending (between ages 27 and 32) independently of all other variables, while an enduring marriage was negatively related to offending and seemed to act as a protective factor. Before-and-after matching analyses showed that getting married led to a decrease in conviction rates compared with remaining single (irrespective of whether a man married a convicted or unconvicted woman), whereas separation from a wife led to an increase in conviction rates compared with staying married. These results are concordant with those reported by Sampson and Laub (1993) in Massachusetts.

Protective Factors

Many of the findings of this survey are probably not surprising to people who work with offenders. Often, people are less interested in the continuity in offending and antisocial behavior than in discontinuity. For example, why do some boys from criminogenic backgrounds nevertheless become successful nonoffenders, and why do some boys from favorable backgrounds nevertheless become antisocial offenders? We investigated good boys from bad backgrounds, and searched for protective factors against delinquency.

About one-sixth of the boys (63) were identified as vulnerable at age 8-10, because they scored at least three out of five on the “vulnerability” measure discussed earlier. Three-quarters of these vulnerable males were convicted of criminal offenses up to age 32, and the vulnerable males were also likely to be identified as having adult social dysfunction at age 32 on the combined measure of living circumstances and behavior. We investigated whether the unconvicted quarter of these boys were affected by any protective factors that might have helped them to achieve successful life outcomes (Farrington *et al.*, 1988b).

Our earlier research suggested that being nervous and withdrawn might act as a protective factor in insulating vulnerable boys against juvenile delinquency (West & Farrington, 1973). Similar tendencies were apparent in the latest analyses up to age 32, but the effects were relatively weak. The most important results were that boys with few or no

friends at age 8, and those without convicted parents or behavior problem siblings at age 10, tended to remain unconvicted; and that boys who were rated favorably by their mothers at age 10 tended to be leading relatively successful lives at age 32. Of course, it may be that the mothers accurately perceived who were the good boys at age 10, rather than that an approving mother had a positive effect on a boy's self-concept. There was some evidence that shyness acted as a protective factor for nonaggressive boys and as an aggravating factor for aggressive boys.

One problem with these analyses was that the unconvicted boys at age 32 were not necessarily leading the most successful lives. We studied the characteristics of unconvicted vulnerable men, convicted vulnerable men, unconvicted nonvulnerable men and convicted nonvulnerable men at age 32 (Farrington *et al.*, 1988a). Surprisingly, the unconvicted vulnerable men were often the most unsuccessful, for example in not being home owners, in living in dirty home conditions, in having large debts and in having low status, lowly paid jobs. They were also the most likely of these four groups to have never married, to have no wife or cohabitee, and to be living alone. Also, they were the most likely to be in conflict with their parents. However, they were generally well-behaved, for example in not taking drugs other than marijuana and in being least likely to commit offenses. Their good behavior may be connected with the fact they were also the most likely to stay in every night.

The search for protective factors often involves the search for interaction effects, for example where a risk factor X predicts offending in the absence of a risk factor Y but not in the presence of a risk factor Y. Interaction effects of various types were reviewed and classified by Farrington (1997b). For example, the most significant interaction effect in predicting early convictions (at age 10-14) was between low family income and separation from a parent: boys who were both separated and from low income families had relatively low conviction rates, compared with boys who were separated only or boys from low income families only. This interaction effect, like others, was significantly predictive independently of all main effects (Farrington, 1994c).

EXPLAINING THE DEVELOPMENT OF DELINQUENCY

As explained, many attempts were made to test hypotheses about intervening causal mechanisms and processes between risk factors and offending, as in the analysis of disrupted families by Juby and Farrington (2001), for example. Also, some attempts were made to test larger theories in specific analyses, such as in the tests of labelling theory by Farrington (1977) and Farrington *et al.* (1978). However, there was also an attempt to propose a larger all-embracing theory that might explain most of the main findings on criminal careers and risk factors for offending.

There is far more agreement about risk factors than about their theoretical interpretation. The major risk factors for offending include poverty, poor housing, and living in public housing in inner city, socially disorganized communities (Farrington, 1999a, 2001c). They also include poor parental child-rearing techniques, such as poor supervision, harsh or erratic discipline, parental conflict, and separation from a biological parent. They also include impulsivity and low intelligence or attainment (which may reflect a poor ability to manipulate abstract concepts and deficits in the "executive functions" of the brain). It seems likely that communities influence parenting, and that parenting influences the development of impulsivity and low intelligence, which in turn are conducive to offending (Farrington, 1993b).

Other risk factors may be linked to poverty, poor parenting, impulsivity or intelligence. For example, teenage mothers tend to live in poverty, with poor housing, unemployed fathers, poor parental supervision and large families, and tend to have impulsive children (Morash & Rucker, 1989; Nagin *et al.*, 1997). Large family size may lead to poor parenting, because of the problem of dividing attention between several children at once. Convicted parents may be poor supervisors of children and disproportionately separated from their spouses, or alternatively there may be genetic transmission of a biological factor linked to offending (Rowe, 1994). The links between delinquent friends, delinquent schools and offending are less clear, but may involve learning

from deviant models. It is also likely that the occurrence of offenses depends on situational factors such as perceived costs, benefits and opportunities (Clarke & Cornish, 1985).

As mentioned, it is important to establish which factors predict offending independently of other factors. Based on the independent predictors in the Cambridge Study, it might be suggested that impulsivity, low intelligence or attainment, poor parenting, an antisocial family and poverty, despite their inter-relations, all contribute in some way to the development of offending. In addition, of course, there is significant continuity in offending and antisocial behavior from childhood to adulthood, even though the prevalence of offending peaks in the teenage years. Any theory needs to give priority to explaining these results.

The Farrington Theory

The theory I have developed (Farrington, 1986b, 1992b, 1996c, 1998) was designed to explain offending and antisocial behavior by working-class males. It distinguishes explicitly between the long-term development of antisocial tendency and the immediate occurrence of offenses and other antisocial acts (Figure 1). The long-term level of antisocial tendency depends on long-term risk factors and on energizing, directing and inhibiting processes. The occurrence of offenses and other antisocial acts depends on the interaction between the individual (with a certain degree of antisocial tendency) and the social environment, and on a decision-making process in criminal opportunities.

It is proposed that the main energizing factors that ultimately lead to long-term, between-individual variations in antisocial tendency are desires for material goods, status among intimates, and excitement. Risk factors influence both long-term antisocial tendency and these desires. For example, the desire for excitement may be greater among children from poorer families, perhaps because excitement is more highly valued by lower-class people than by middle-class ones, because poorer children think they lead more boring lives, or because poorer children are less able to postpone immediate gratification in favor of long-term goals (which could be linked to the emphasis in lower-class culture on the concrete and

present as opposed to the abstract and future). The main energizing factors that lead to short-term, within-individual variations in antisocial tendency are boredom, frustration, anger and alcohol consumption, which are influenced by life events.

In the directing stage, these motivations lead to an increase in antisocial tendency if socially disapproved methods of satisfying them are habitually chosen. The methods chosen depend on maturation and behavioral skills; for example, a 5-year-old would have difficulty stealing a car. They also depend on risk factors. Some people (e.g. children from poorer families) are less able to satisfy their desires for material goods, excitement and social status by legal or socially approved methods, and so tend to choose illegal or socially disapproved methods. The relative inability of poorer children to achieve their goals by legitimate methods could be because they tend to fail in school and tend to have erratic, low status employment histories. School failure in turn may often be a consequence of the less stimulating intellectual environment that lower-class parents tend to provide for their children, and their lack of emphasis on abstract concepts.

In the inhibiting stage, antisocial tendencies can be reduced by internalized beliefs and attitudes that have been built up in a social learning process as a result of a history of rewards and punishments. The belief that offending is wrong, or a strong conscience, tends to be built up if parents are in favor of legal norms, if they exercise close supervision over their children, and if they punish socially disapproved behavior using love-oriented discipline. Antisocial tendency can also be inhibited by empathy, which may develop as a result of parental warmth and loving relationships. There are individual differences in the development of these internal inhibitions. Perhaps because of associated neurological dysfunctions, children with high impulsivity and low intelligence are less able to build up internal inhibitions against offending, and therefore tend to have a high level of antisocial tendency.

The decision-making stage specifies how the individual interacts with the environment to commit crimes and other antisocial acts. In general, crimes require opportunities and victims, and these are influenced by routine activities. Encountering a tempting opportunity may cause a short-term increase in antisocial tendency, just as a short-term increase in antisocial tendency may motivate a person to seek out a criminal opportunity. Whether a person with a certain degree of antisocial tendency commits an antisocial act in a given situation depends on cognitive processes, including considering the costs, benefits and probabilities of the different outcomes and stored behavioral repertoires or scripts. The costs and benefits include immediate situational factors such as the material goods that can be stolen and the likelihood and consequences of being caught by the police, as perceived by the individual. They also include social factors such as likely disapproval by parents or spouses, and encouragement or reinforcement from peers. In general, people tend to make rational decisions. However, more impulsive people are less likely to consider the possible consequences of their actions, especially consequences that are likely to be long delayed.

The consequences of offending may, as a result of a learning process, lead to changes in antisocial tendency or in the cost-benefit calculation. This is especially likely if the consequences are reinforcing (e.g. gaining material goods or peer approval) or punishing (e.g. legal sanctions or parental disapproval). Also, if the consequences involve labelling or stigmatizing the offender, this may make it more difficult for him to achieve his aims legally, and hence there may be an increase in his antisocial tendency. In other words, events that occur after offending may lead to changes in energizing, directing, inhibiting or decision-making processes in a dynamic system.

Applying the theory to explain some of the results reviewed here, children from poorer families may be likely to offend because they are less able to achieve their goals legally and because they value some goals (e.g. excitement) especially highly. Children with low

intelligence may be more likely to offend because they tend to fail in school and hence cannot achieve their goals legally. Impulsive children, and those with a poor ability to manipulate abstract concepts, may be more likely to offend because they do not give sufficient consideration and weight to the possible consequences of offending. Also, children with low intelligence and high impulsivity are less able to build up internal inhibitions against offending.

Children who are exposed to poor parental child rearing behavior, disharmony or separation may be more likely to offend because they do not build up internal inhibitions against socially disapproved behavior, while children from criminal families and those with delinquent friends tend to build up anti-establishment attitudes and the belief that offending is justifiable. The whole process is self-perpetuating, in that poverty, low intelligence, and early school failure lead to truancy and a lack of educational qualifications, which in turn lead to low status jobs and periods of unemployment, both of which make it harder to achieve goals legitimately.

OTHER ISSUES

Limitations of the Study

The Cambridge Study provides information about the development of offending and antisocial behavior in an inner-city, working-class British White male sample born about 1953. How far the same results would be obtained with females, Black or Asian children, suburban or rural children, middle or upper class children, children born more recently, or children born in other countries are interesting empirical questions. Generally, results obtained with the Cambridge Study are similar to those obtained with comparable male samples from Sweden (Farrington & Wikström, 1994), Finland (Pulkkinen, 1988) and from

other Western industrialized countries, but more replications would be desirable. In particular, new longitudinal studies should be mounted in England, to investigate the effect of social changes such as the increased number of single-parent families, and delinquent development in different ethnic groups. No new English studies on the development of delinquency have been mounted for many years (although one began in the 1990s in Scotland).

The Cambridge Study has the usual methodological problems of longitudinal surveys. While the problem of attrition was largely overcome, the problem of testing effects (the effects on the subjects of repeated interviews) was not investigated. In retrospect, other boys from the same schools, who were not interviewed, should have been followed up in records to control for testing effects, but this was not a feature of the initial design (Farrington & West, 1981, p. 139). More frequent data collection would have allowed better tracing of individual development over time, but on the other hand the gaps between data collection efforts gave time to analyze the data and write up the results.

Inevitably, some of the initial measures now appear rather old-fashioned. For example, the method of measuring parenting variables (relying on psychiatric social workers interviewing parents) caused problems, and great efforts had to be made to try to achieve consistency and objectivity. No pilot work was carried out at the beginning of the Study, because of the pressure to begin data collection as soon as possible. While the main aim was to measure all relevant variables, the measurements of biological and neighborhood variables were clearly inadequate, and the measurement of individual factors also left a lot to be desired in retrospect. It is unfortunately not possible in the Cambridge Study to investigate the interaction between individual development and neighborhood context.

Because we did not include a behavior genetic design (e.g. studying twins or adopted children), we cannot investigate how much of the link between poor parenting and behavior

was mediated by genetic factors. Because of the focus on English personality questionnaires, key constructs such as empathy, egocentricity, guilt and depression were not measured. The attempts to study protective factors may have been inadequate, because far more was known about risk factors, and hence the measurement and analyses focussed on risk factors. There should have been more emphasis on resilience, strengths and successful outcomes of disadvantaged males.

Validity checks were made where possible to compare interview data with external information from records. For example, admissions of convictions were compared with criminal records of convictions, and the mother's report of the boy's birth weight was compared with hospital records. Reliability checks were also made. For example, information about the same topic (e.g. school leaving age) from different interviews was compared, as was information about the same topic from different parts of the same interview. Generally, the men were randomly allocated between our two or three interviewers in each wave in order to study interviewer effects, but fortunately these were rare. Sometimes, information could be tested for predictive validity, and the self-reported delinquency tests have already been mentioned. As another example, more than twice as many of those who said that they had sexual intercourse without using contraceptives at age 18 subsequently conceived a child outside marriage as of the remainder (Farrington & West, 1995). All of these checks suggested that our males were genuinely trying to tell the truth. Of course, more validity checks would have been desirable, but these would have required more types of external records than we could obtain.

The sample was too small to study rare events, such as sex offenders or perinatal complications, effectively. The interviews were too infrequent to establish the exact or relative timing of many life events, and hence to establish developmental sequences between presumed causes and observed effects. The lack of experimental interventions

made it difficult to test causal models effectively. The single cohort design made it difficult to distinguish between aging and period effects; for example, between ages 14 and 18 the percentage who had taken drugs increased from less than 1% to 31%, but this was probably a function of the time period (from 1967 to 1971).

In order to overcome these kinds of problems, it would be highly desirable in future longitudinal studies of delinquency to include multiple age cohorts and experimental interventions, to begin prenatally with one cohort, and to have more frequent interviews and larger samples (Farrington, 1991c; Farrington, *et al.* 1986b; Tonry *et al.*, 1991). This kind of design has actually been implemented in Chicago (Harvard University, 2000). However, because ideal designs cost a great deal of money, more limited compromise designs like the Cambridge Study are likely to predominate in the foreseeable future.¹

Policy Implications

The main policy implications of the Cambridge Study are relevant to risk assessment and risk-focussed prevention. Risk assessment tools such as the EARL-20B (Augimeri *et al.*, 1998), which aims to identify children who are at risk of reoffending, are based on longitudinal surveys that have discovered the most important risk factors for offending. As mentioned, the predictive efficiency of various risk scores has been investigated in the Cambridge Study (e.g. Farrington, 2000a, 2001a, 2002). While risk assessment and risk-focussed prevention are relevant to the onset and persistence of offending, the Cambridge Study also has policy implications for desistance (e.g. in showing the beneficial effects of employment, marriage and moving house).

Risk-focussed prevention suggests that, in order to reduce offending, the key risk factors should be identified and programs should be implemented to tackle these risk factors (Farrington, 2001b; Hawkins & Catalano, 1992; Loeber & Farrington, 1998, 2001). Based on the Cambridge Study, it might be suggested that early prevention experiments are especially

needed that target four important risk factors: low intelligence/attainment, poor parental child-rearing behavior, impulsivity and poverty (Farrington, 1990b, 1994b, 2000a). To the extent that these experiments lead to reductions in offending, this will increase our confidence that these risk factors have causal effects or are part of causal chains leading to offending (Robins, 1992).

It is difficult to know how and when it is best to intervene, because of the lack of knowledge about developmental sequences, ages at which causal factors are most salient, and influences on onset, persistence and desistance. For example, if truancy leads to delinquency in a developmental sequence, intervening successfully to decrease truancy should lead to a decrease in delinquency. On the other hand, if truancy and delinquency are merely different behavioral manifestations of the same underlying construct, tackling one symptom would not necessarily change the underlying construct. Experiments are useful in distinguishing between developmental sequences and symptoms, and indeed, Berg *et al.* (1979) found experimentally that decreases in truancy were followed by decreases in delinquency.

There is not space here to review effective intervention programs. Briefly, low intelligence and attainment can be targeted in preschool intellectual enrichment programs such as the Perry study (Schweinhart *et al.*, 1993). Poor parental child-rearing behavior can be targeted in general parent education programs in pregnancy and the first few years of life of the child (e.g. Olds *et al.*, 1998) or in more specific parent management training programs (e.g. Patterson, 1982). Impulsivity can be targeted in cognitive-behavioral skills training programs (e.g. Ross & Ross, 1995). Poverty has been targeted in income maintenance experiments, but there is no evidence of any effect on children's delinquency (e.g. Groeneveld *et al.*, 1979). Combined programs that target several risk factors, using both

parent training and child skills training for example, are often the most effective (Hawkins *et al.*, 1999; Tremblay *et al.*, 1995; Wasserman & Miller, 1998).

The Cambridge Study has influenced the thinking of the British government about crime policy. Certainly, between 1990 and 1992, it influenced Home Secretary Kenneth Baker and his junior minister John Patten, who drafted out a Green Paper on early prevention in 1992 that drew on the Study's conclusions. In 1989, John Patten stated that:

'This important study has been influential both in this country and in the United States. It bears out much of the Home Office's current thinking about juvenile crime. It is an excellent example of how academic work, funded by government, can help in policy-making... I will be examining Dr. Farrington's conclusions, and their pointers toward future action, very fully indeed'.
(Rock, 1994, p.153).

In documenting the development of early prevention ideas in the Home Office in 1990-92, Rock (1994) reported that:

There was one article [Farrington & West, 1990] that circulated about the [Home] Office at just that time, an article that had again made out the case for using longitudinal studies to predict and control delinquency, and for social prevention experiments to prevent the development of crime and antisocial behaviour... An official remarked of Farrington's influence: 'There is a theory for a particular time and maybe what he is saying is just one of the things that particularly suit at the moment'.
(Rock, 1994, p. 150).

From 1997 onwards, the new Labour government became more enthusiastic about risk-focussed prevention, and it has been implemented in numerous places by the Rowntree Foundation in its "Communities That Care" program (Farrington, 1996c; Communities That Care, 1997). Especially taking account of more than 120 publications on the Cambridge Study, I would argue that the benefits of this project in advancing knowledge have greatly outweighed its costs.

Current Research and Future Plans

The males are now (in 2000-02) being given a social interview at about age 46 to assess their current and recent self-reported offending and their current success in different

aspects of their lives (accommodation, employment, debts, illnesses and injuries, relationships, children, drinking, smoking, drug use, aggressive behavior and attitudes, and current personality). Questions are also asked about the use of health and social services, to permit an economic analysis of costs to society, and about problems of the men's children such as lying, stealing, truancy, disobedience, bullying and restlessness. Many of the questions to the males are the same as those given at ages 18 and 32; the same attitude questionnaire is being given at ages 18, 32 and 46. The General Health Questionnaire is given at ages 32 and 46, and the Eysenck Personality Inventory at ages 16 and 46. The "Big Five" Personality Inventory is given at age 46.

The men are also being given a medical interview (using the SCID) to assess their current mental health and their life-time history of psychiatric disorders. Questions in both interviews, together with file data, make it possible to score each man on the Psychopathy Checklist. At the end of the medical interview, biological data are collected; saliva to measure testosterone, height, weight, waist circumference, pulse rate, blood pressure and respiratory function. Questions on physical health and illnesses are also included, and medical records are being collected.

In addition, the men's female partners are being personally interviewed to collect information on household income, children, her child-rearing attitudes, relationships with the man, family violence, her physical and mental health, her antisocial behavior (including debts, offending, drinking and drug use), his antisocial behavior, his personality (on the "Big Five" Inventory), characteristics of the neighborhood, and household victimization. At age 46, the partner completes the same General Health Questionnaire as the man, and the same child-rearing attitude questionnaire as his partner completed at his age 32 and his mother completed when he was age 12.

The current follow-up project is very much a collaborative effort, directed by a steering committee consisting of myself (Chair), Jeremy Coid, John Gunn, Clive Meux, Temi Moffitt and Donald West. The main aims are to investigate offending in the mid-40s, characteristics of late-onset offenders, and how far men who have stopped getting convicted are still involved in antisocial behavior. In addition, the social interview will establish how far former juvenile delinquents, and former chronic offenders, are living successful lives in their 40s, in such areas as accommodation, employment, relationships, drinking, smoking and drug use, so that protective factors can be studied. The medical interview will establish the relationship between offending and adult mental health problems, including antisocial personality disorder. The partner interview will establish the prevalence of different types of family violence and how far it can be predicted by risk factors in childhood and adolescence.

Regarding future data collection plans, it is hoped to obtain funding to interview up to 500 children of the Study males aged 13-30, in 2002-04. This Third Generation Follow-up would establish how far risk factors discovered years ago are still important in modern times, and how far the relative importance of risk factors has changed. It would also provide unique data on the transmission of offending, antisocial behavior and mental health problems between three generations, and also on why children from criminal families are particularly at risk of offending themselves. Perhaps even more important, the new project would suggest reasons why children from criminogenic backgrounds do not become offenders.

Because of the extensive data on the Study males, the Third Generation Follow-Up would provide detailed information about the importance of the father in relation to child offending and antisocial behavior. Many studies of family factors focus on the mother and neglect the father, because fathers are often more elusive than mothers. Also, the new project would make it possible to compare risk factors for offending and antisocial behavior for male children with those for female children. It is important to know whether the risk

factors for offending are similar or different for males and females (see Moffitt *et al.*, 2001).

As indicated, there are many planned analyses, including studies of the development of and risk factors for alcohol and drug use. Currently, one fruitful collaboration is with Carolyn Smith in investigating parental child rearing versus child antisocial behavior in two successive generations. High priority analyses for the future include a more extensive analysis of the onset, frequency and desistance of self-reported offending up to age 32, in comparison with convictions; and a study of the financial costs of offending. It would also be desirable to investigate late-comers to crime and to do more research on protective factors and on successful men from deprived backgrounds.

CONCLUSIONS

The Cambridge Study shows that the types of acts that lead to convictions (principally, crimes of dishonesty) are components of a larger syndrome of antisocial behavior. Generally, working class males are versatile rather than specialized in their offending and antisocial behavior. The high degree of continuity between ages 18 and 32, during a period of enormous environmental change, suggests that stability lies in the individual rather than in the environment. Our conclusion is that there are individual differences between people in some general underlying theoretical construct which might be termed "antisocial tendency", which is relatively stable from childhood to adulthood.

Importantly, there is relative stability but absolute change in antisocial behavior. Offending may increase or decrease over time, but the worst offenders at one age still tend to be the worst at another age. While the relative position of individuals on this underlying dimension is sufficiently stable to allow significant prediction from age 8 to age 32, the stability should not be exaggerated. Significant predictability does not mean that outcomes are inevitable or that people cannot and do not change. The good news is that most juvenile delinquents were leading quite successful lives by age 32.

The Cambridge Study also shows how far self-reported and official offending can be predicted in advance, in childhood. Previous projects did not measure such a wide range of theoretical constructs in advance of offending, and so they were not able to show so effectively which variables predicted offending independently of others or the relative importance of different variables. The most important independent childhood predictors of offending in this research could be grouped under the headings of antisocial child behavior, impulsivity, low intelligence or attainment, family criminality, poverty and poor parental child-rearing behavior. Many of these findings have been replicated in other countries.

The Study also shows how far convicted offenders and unconvicted males were significantly different in numerous respects before, during and after their criminal careers. Furthermore, differences between convicted offenders and unconvicted males were similar to differences between high and low self-reported delinquents, where boys in the high category were more frequent, serious and versatile offenders. Previously, it has been argued that everyone committed offenses and that differences between convicted and unconvicted males largely reflected police or court biases, but this view can be firmly rejected. The concordance between official records and self-reports, and the ability of self-reports to predict future convictions, shows that both measures are validly detecting the worst offenders.

The Study provides detailed information about criminal careers and co-offending, and shows how far offending is concentrated in certain persons and certain families. The study of conviction careers of fathers and mothers shows that offending is more persistent than previously believed. A small number of chronic offenders, usually coming from multi-problem families, accounted for substantial proportions of all official and self-reported offenses, and they were to a considerable extent predictable in advance. The fact that a large proportion of

the crime problem is attributable to a small number of persons and families who are identifiable is potentially good news for prevention and treatment.

The Study also shows the importance of within-individual analyses, in documenting the effects of life events on the course of development of offending. In particular, it provides perhaps the most detailed quantitative information about factors influencing desistance: being employed as opposed to unemployed, getting married and staying married, and moving out of London. It also shows that desistance from offending generally coincides with an improvement in other life circumstances.

The main policy implication of the Cambridge Study is that, in order to reduce offending and antisocial behavior, early prevention experiments are needed targeting four important predictors that may be both causal and modifiable: low achievement, poor parental child-rearing behavior, impulsivity and poverty. Because of the link between offending and numerous other social problems, any measure that succeeds in reducing crime will probably have benefits that go far beyond this. Early prevention that reduces offending would probably also reduce drinking, drunk driving, drug use, sexual promiscuity and family violence, and perhaps also school failure, unemployment and marital disharmony.

Social problems are undoubtedly influenced by environmental as well as individual factors. However, to the extent that all of these problems reflect an underlying antisocial tendency, they could all decrease together. It is clear from our research that antisocial children tend to grow up into antisocial adults, and that antisocial adults tend to produce antisocial children. Major intervention efforts, firmly grounded on empirical research results, such as those obtained in the Cambridge Study, need to be made to break this cycle.

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Note

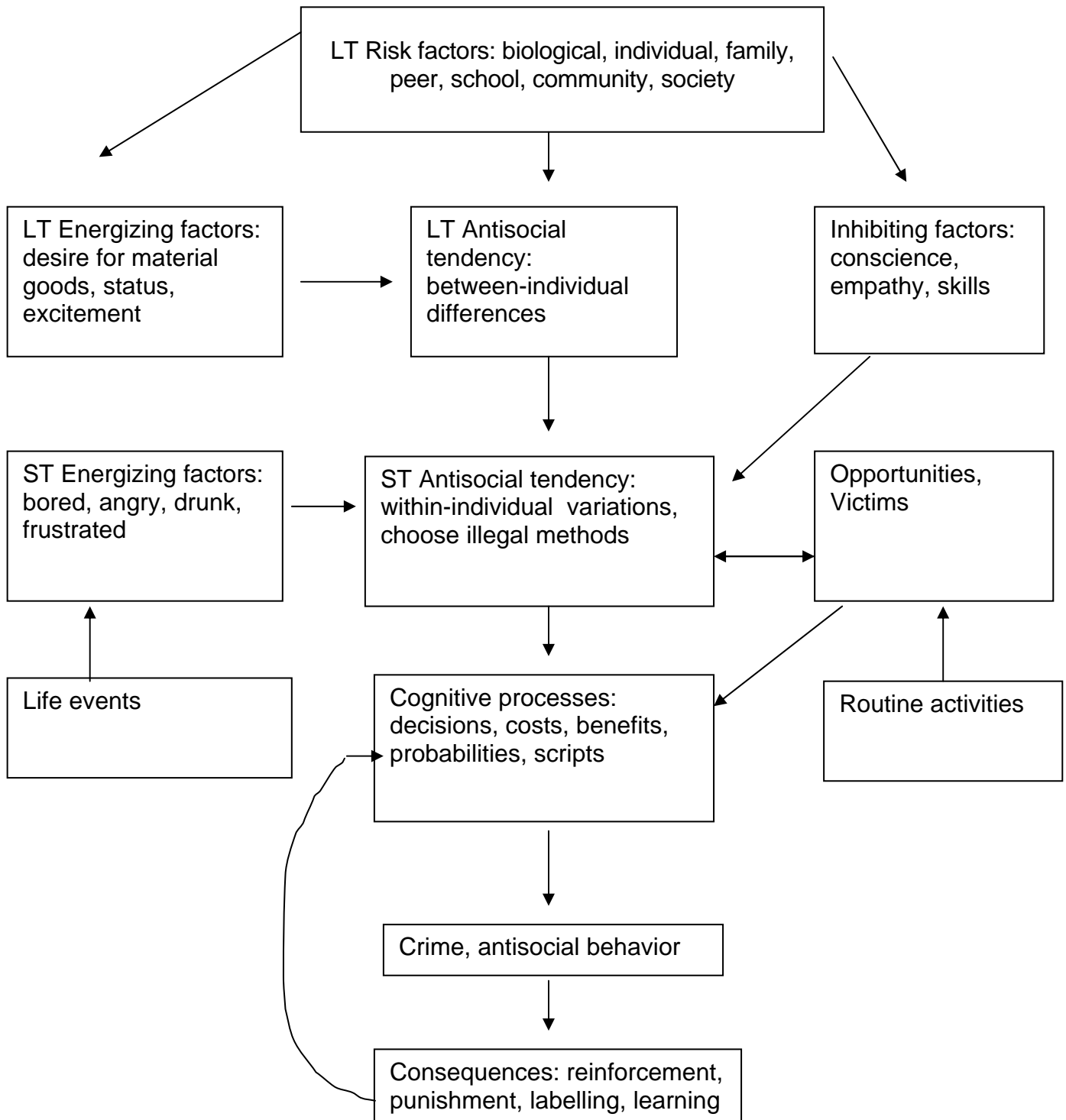
1. I am very grateful to the Home Office and the Department of Health for funding the Cambridge Study intermittently since 1961. However, the Study has never had the generous level of funding enjoyed by major American longitudinal surveys, and neither has it ever had a guarantee of continued funding for more than three years at a time. In general, funds have been provided only for data collection, not for data analysis. This has meant that, certainly in the last 20 years, the main burden of directing the study and doing most of the data manipulation and analysis has fallen on me. There are advantages in the principal investigator having intimate day-to-day contact with the data collection effort and doing most of the analyses himself, but there are obvious limitations on what one person can achieve.

It is easier to plan analyses than to carry them out, and of course it takes even longer to shepherd papers through the typically tortuous process of publication in major journals. Several years ago, I developed a master plan of desirable analyses, and I keep a careful record of all analyses completed and of the contents of all publications, which is necessary in order to write summary chapters like this one. However, the data has never been exploited to study less central topics such as the development of and risk factors for smoking, drinking, drug use and sexual behavior, for example. In Great Britain, we have not generally had the tradition of Ph.D. students working with a Professor on data collected in a major study. Rather, the British Ph.D. student typically designs his or her own study and single-handedly carries it through all the stages from conception to completion, including data collection, analysis and writing up. Not surprisingly, British Ph.D. theses in criminology tend to be small scale cross-sectional surveys of no more than 200 persons.

Of course, one way of increasing the number of publications from a Study is to collaborate with other researchers, and I have enjoyed many collaborations. Another way is to deposit data in a data archive, and anonymized Cambridge Study data from age 8 to age

25 were deposited in the University of Michigan ICPSR archive in 1984, and later in the University of Essex data archive in England. While this has stimulated wider use of the data (e.g. Hagan, 1993; Hagan & Palloni, 1990; Paternoster & Brame, 1998; Polakowski, 1994), one disadvantage is that data users rarely contact the principal investigator, except when they want more data. Hence, it is largely a matter of chance whether the principal investigator finds out about publications based on the data, and there is no communication in practice about how the data are being used.

FIGURE 1
The Farrington Theory



Notes: St = Short-Term, LT = Long-Term

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