

**SOCIAL INCLUSION AND EARLY DESISTANCE
FROM CRIME**

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KEY FINDINGS

Offending peaked around the age of 14 among both boys and girls in the Edinburgh Study cohort. This finding is based on a broad measure of self-reported delinquency. The peak age for a measure of more serious self-reported delinquency was also 14 for girls, but was 14-15 for boys.

After the age of 14 there was a fairly steep and steady decline in the proportion of young people involved in broad delinquency among both boys and girls. Among those who continued to be involved, the amount of offending also declined. There was a similar decline in the proportion involved in more serious delinquency, except that in boys this started after the age of 15 rather than 14.

It was therefore common for young people to reduce their offending sharply or stop altogether in early or middle adolescence. At sweep 3 (age 14), 52.2 per cent of boys had engaged in four or more delinquent acts in the previous 12 months. By sweep 6 (age 17), nearly half of these (amounting to 24.5 per cent of the total) had stopped or sharply reduced their offending. Among girls, the proportion offending was lower, and the rate of desistance from offending was higher.

There was no evidence that deprivation at the level of the individual family was associated with continuing to offend. Young people from higher social classes and intact families were no more likely than others to desist from offending.

Desistance was, however, associated with the characteristics of the neighbourhood where the young person lived. Continuing to offend was more common in deprived neighbourhoods, whereas desistance was more common in advantaged ones. Also, desistance was less likely in neighbourhoods perceived to be disorderly, and where residents were dissatisfied with the neighbourhood.

Bonds with teachers and parents, and parents' involvement in school, were associated with desistance from offending.

Young offenders who had been caught by the police were considerably more likely to continue offending than offenders who had not been caught.

INTRODUCTION

This paper examines the pattern of change in the level of offending as young people move through adolescence between the ages of 12 and 17. In particular, it examines why offending declines among a substantial proportion of young people after the age of 14, whereas it continues among others. The analysis focuses on factors connected with social inclusion and bonds with school and family. It draws on findings from the Edinburgh Study of Youth Transitions and Crime (the Edinburgh Study), a longitudinal research programme exploring pathways into and out of offending among a single cohort of young people who started secondary school in the City of Edinburgh in 1998. The key aims and methods of the study are summarized below.¹

Aims of the programme

- To investigate the factors leading to involvement in offending and desistance from it
- To examine the striking contrast between males and females in criminal offending
- To explore the above in three contexts:
 - Individual development
 - Interactions with formal agencies of control
 - The social and physical structures of neighbourhoods
- To develop new theories explaining offending behaviour and contribute to practical policies targeting young people

Overview of methods

- Self report questionnaires (annual sweeps)
- Semi-structured interviews (40 undertaken in sweep 2)
- School, social work, children's hearings records (annual sweeps)
- Teacher questionnaires (1999)
- Police juvenile liaison officer and Scottish criminal records (from 2002)
- Parent survey (2001)
- Geographic information system

Participating schools

- All 23 state secondary schools
- 8 out of 14 independent sector schools
- 9 out of 12 special schools

Response Rates

- Sweep 1 96.2% (n=4,300)
- Sweep 2 95.6% (n=4299)
- Sweep 3 95.2% (n=4296)
- Sweep 4 92.6% (n=4144)
- Sweep 5 89.1% (n=3856)
- Sweep 6 80.5% (n=3531)

Research Team

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Study Funding

- Economic and Social Research Council (1998 - 2002)
- The Scottish Executive (2002- 2005)
- The Nuffield Foundation (2002 - 2006)

¹ See also Smith et al (2001) and Smith and McVie (2003) for further details of the study.

Context

Delinquency and criminal offending peak in adolescence or early adulthood and decline throughout the rest of the life course (Smith, 2002). In broad terms, this pattern applies to different societies, historical epochs, and population groups. The peak in officially recorded offending (as reflected by convictions) comes later than the peak in self-reported offending (as measured in the Edinburgh Study) but nevertheless comes in late adolescence. The peak in more serious and in white collar crimes comes later, but even these offences tend to be committed by younger people. This pattern means that many young offenders either stop offending or markedly reduce their offending as they reach their early twenties. On the other hand, some continue, and those who do so tend to be the most serious offenders (Smith, 2002).

It is important to understand why some young offenders stop, whereas others continue. Understanding desistance and persistence in offending can help in designing a framework of criminal justice and social work that will encourage young people to grow out of crime. Six types of explanation provide the framework for an investigation of the question.

1. Moffitt (1993) identified two distinct types of offenders, life-course persistent and adolescence-limited. On this view, life-course persistent offenders engage in anti-social behaviour throughout their lives, although this takes different forms at different phases of development.² By contrast, adolescence-limited offending increases rapidly then falls during the teenage years. Persistent behaviour problems are caused by a lack of ability to restrain immediate impulses and plan ahead, arising from constitutional factors combined with early upbringing. By contrast, adolescence-limited offending is normal behaviour aimed at demonstrating maturity, so that once a person appears to be an adult, it drops away.
2. In recent years, some criminologists (e.g. Sampson and Laub, 1993) have returned to the theory that the strength of social bonds explains why most people do not engage in crime. Offending could be high in adolescence when young people are detaching themselves from the childhood relationships that bound them into the social fabric, but have not yet formed adult attachments, so that they are loosely integrated with the rest of society. On this theory, they will desist from crime as new social bonds are formed.
3. The ideas of labelling theorists such as Lemert (1967) were intended to explain why some people become locked into a cycle of offending. On this view, those who are caught and punished are deliberately stigmatized by the criminal justice system. Typically, they change their view of themselves to fit the criminal label, and adopt a way of life and a circle of associates that turn them into confirmed criminals. To a large extent they lose the ability to choose a different way of life. In recent years, criminologists (e.g. Maruna, 2001) have begun to study ways in which people who have been caught up in the criminal justice system can nevertheless find new sources of self worth and a new path in life.

² The term 'antisocial behaviour' includes both criminal and non-criminal conduct. Moffitt argues that an antisocial tendency manifests itself as very difficult behaviour (e.g. tantrums) in early childhood but as dangerous (e.g. fast driving) or criminal behaviour (e.g. serious assault) in adulthood. Also, differences in the way that others react to antisocial behaviour in children and adults mean that similar behaviour may be regarded and classified differently depending on the age of the person concerned.

4. Sampson and Laub (1993) have argued that people's position in the social structure influences their long-term path of development. For example, parenting and hence child development may be influenced by the resources available to parents (money, time, housing, neighbourhood facilities). The strength of social bonds and the formation of a positive self image may be influenced by the level of deprivation, stress, and dislocation in the area where the young person grows up.
5. The balance of opportunities may influence whether a young person desists from offending. Strain theory (Merton, 1938) emphasizes the lack of opportunities to progress legitimately as a cause of continued offending. Situational crime prevention (Clarke, 1997) emphasizes opportunities to commit specific crimes in the absence of effective constraints.
6. The influence of peers and other associates may help to explain why young people go on offending, especially when they engage in crime-prone activities together in small groups. Equally, a change in friends and associates may explain why some people stop offending (Warr, 2002).

The analysis presented in this report focuses on explanations for desistance that are connected with inclusion or integration into the social fabric. It concentrates, therefore, on integration through formation of social bonds, the excluding consequences of punishment, and the influence of social structure on both integration and exclusion (points 2, 3 and 4 above).

Structure of the report

The first part of the report describes the measures of delinquency included in the young people's self-completion questionnaires and shows how prevalence and frequency of offending changed over the six annual sweeps, for males and females. Part two focuses on explaining the changes in offending over the two to three years following sweep 3 (age 14) using a variety of potential explanatory variables, including factors connected with social exclusion and bonds with school and family, neighbourhood characteristics, experience of police contact and level of prior offending. The report ends with conclusions about factors that are most important in explaining desistance from offending.

PART 1: CHANGE IN OFFENDING BETWEEN THE AGES OF 12 AND 17

The present analysis is based on young people's self-reports of their own delinquency. The Edinburgh Study has also collected information about cohort members each year from social work and children's hearing files (where a file exists for the individual or their family). These official records show among other things whether a young person has been referred to the children's hearing system for offence-related reasons in a particular year. Analyses reported elsewhere (McAra and McVie, 2005) have examined the relationship between self-reported and officially recorded offending. Such analyses have shown that self-reports provide a much fuller and in most respects a more accurate account of criminal offending and lesser delinquency than is available from official records.

The questions on self-reported delinquency are summarized in panel 1 and the measures created from these individual questions are shown in panel 2, below. For comparison over the six sweeps of the study, eleven items covering different types of delinquency were used. These were the eleven items that remained exactly the same at all six sweeps (except that one of them, harming animals, was not included at sweep 1). Other items not included in this analysis were ones that being typical of young teenagers were dropped in later sweeps, or ones that being typical of older teenagers were introduced at later sweeps. However, the eleven constant items can be regarded as the central ones describing the mainstream of teenage delinquent behaviour. The broad measure of delinquency covers all eleven items, and counts the number of times that a person engaged in any of these forms of behaviour over a 12-month reference period. At sweep 1, cohort members were asked to rate the seriousness of each type of delinquent behaviour. The seven types of behaviour considered most serious (see panel 1) have been used to construct a measure of the volume of serious delinquency. This measure is necessarily imprecise, because a particular type of delinquency may encompass a wide range (e.g. the seriousness of damage to property varies depending on the extent and value of the damage done).

Panel 1: Items of delinquency

Reference period:

Sweep 1: 'ever'

Sweeps 2-4: last 12 months (the last school year and summer holidays)

Items of delinquency:

1. shoplifting
2. noisy or cheeky in public
3. joyriding*
4. carrying a weapon*
5. damage to property*
6. housebreaking*
7. robbery (theft with force or threats)*
8. fire-raising*
9. assault
10. car-breaking*
11. hurting or injuring animals (not included at sweep 1)

*Items included in the measure of 'serious delinquency'. These are the items rated as most serious by respondents at sweep 2. All 11 items are included in the measure of 'broad delinquency'.

Panel 2: Measures of delinquency

Prevalence:

The percentage of cohort members engaging in any one of the delinquent acts (or serious delinquent acts) in the reference period.

Variety measures:

A count of the number of items (e.g. the number of different types of delinquency the person had engaged in).

Volume measures:

A count of the number of occasions (e.g. the number of occasions on which the person had engaged in a delinquent act).

Figure 1 shows the prevalence and volume of broad offending over the six sweeps of the study for males and females. Among boys, the prevalence of broad offending was 74 per cent at the age of 12; it remained level up to sweep 3 (age 14), then fell fairly steadily and steeply to reach 48 per cent at sweep 6 (age 17). Volume of broad offending among boys rose between the ages of 12 and 14, and then fell more steeply than prevalence. The level of offending was lower among girls throughout, but the pattern of change between the ages of 12 and 17 was similar.

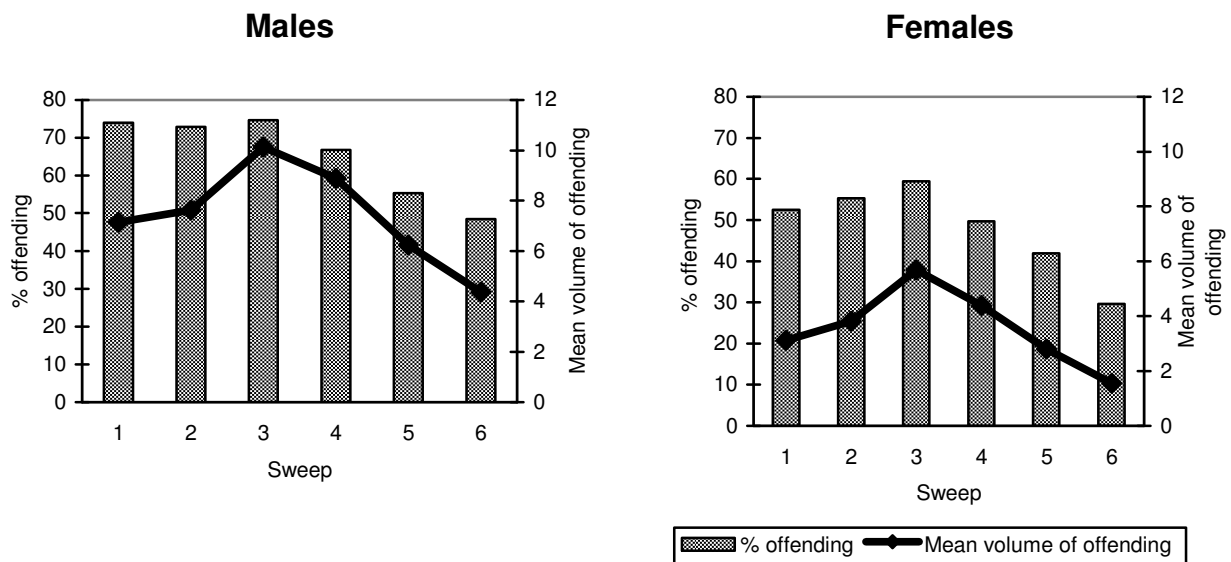


Figure 1: Trends in broad offending (11 items) sweeps 1 to 6 (ages 12 to 17), by sex³

³ In all figures, data for sweeps 5 and 6 are weighted to correct for small biases caused by non-response at these sweeps.

Figure 2 focuses on those who did engage in one of the delinquent acts over the relevant time period. It shows that among offenders, the amount of offending also increased up to the age of 14, and then fell. Thus, the rise and fall in offending in adolescence is a change both in the prevalence of offending (the proportion of young people involved) and in the frequency of offending among those who offend at all. For the Edinburgh Study cohort, this contradicts the theory (Blumstein, Cohen & Farrington, 1988) that the age-crime curve only reflects change in the proportion of people who are active offenders at any one period of their lives. For the Edinburgh Study cohort, it also reflects change in the intensity or frequency of their involvement.

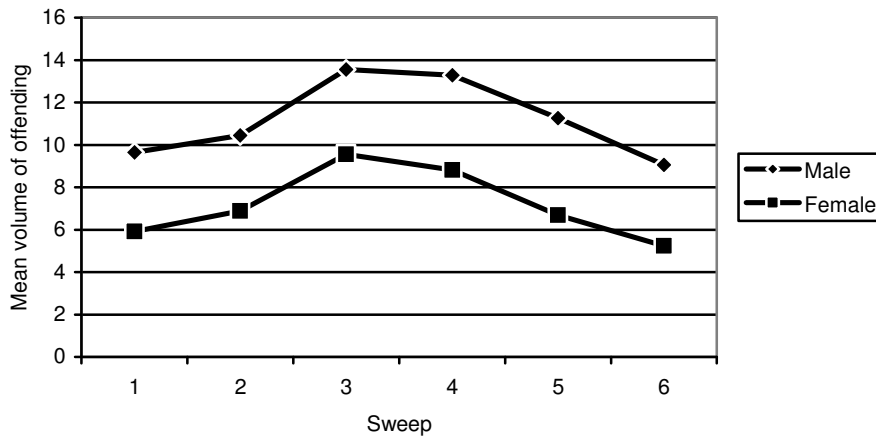


Figure 2: Volume of offending among offenders during the 12 month reference period

The trend in more serious offending is shown in figure 3. As discussed in an earlier report in this series (McAra and Smith, 2004) there is a larger difference between boys and girls in the level of serious offending than in the level of broad offending, as also illustrated by figure 3. In the case of serious offending, the decline among boys did not start until the age of 15.

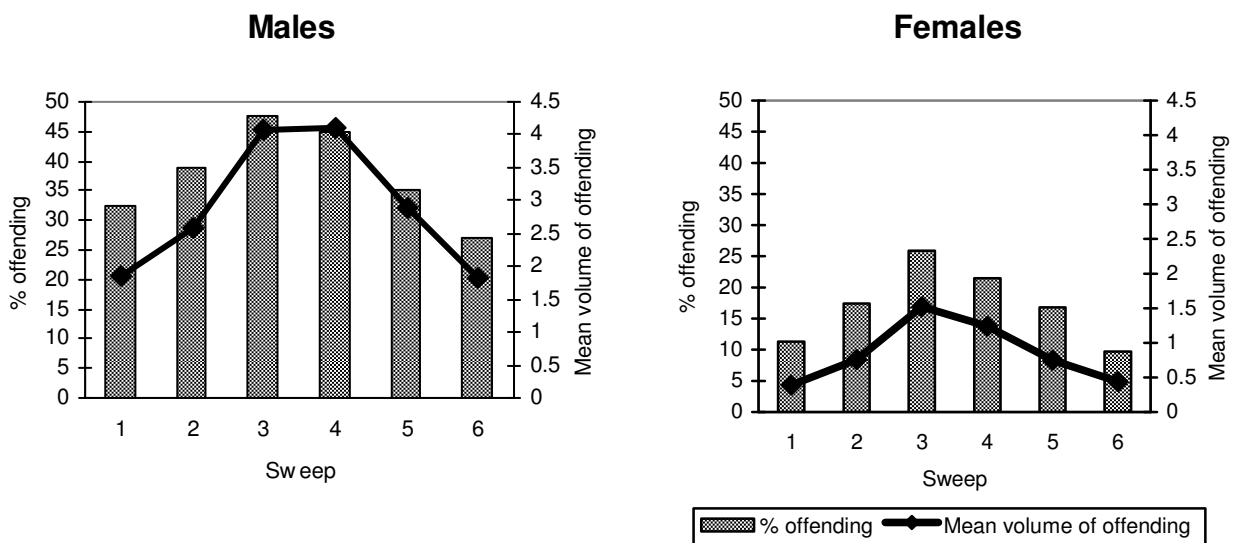


Figure 3: Trends in serious offending (7 items) sweeps 1 to 6 (ages 12 to 17), by sex

An implication of these trends in offending with increasing age is that a considerable proportion of young people stop offending or reduce their offending after the age of 14. There are also some who start offending or increase their offending after this age, but they are more than balanced by a larger proportion of cohort members who change in the opposite direction. Here we focus on the extent of the early decline in offending among the Edinburgh Study cohort. We have first of all identified those whose volume of offending was 4+ at sweep 2 (age 13), meaning that they had engaged in one of the 11 types of delinquency on at least four occasions during the 12-month reference period. For each of these early offenders, we established whether their offending clearly declined at each of the following sweeps. In the case of those whose earlier volume of offending was 10+, a clear decline was defined as a reduction to a score of 0-3. In the case of those whose earlier volume of offending was 4-9, only a drop to zero was regarded as a clear decline. The analysis was repeated taking sweep 3 instead of 2 as the baseline. The findings are shown in table 1.

Table 1: Change in self-reported delinquency at sweeps 2 to 5

	Males		Females	
	% of all		% of all	
<i>Volume of self-reported delinquency at sweep 2</i>				
0-3 offences	52.0		70.7	
4+ offences	48.0		29.3	
		<i>% of those 4+ at sweep 2</i>		<i>% of those 4+ at sweep 2</i>
Clear decline sweep 2-3		12.0		12.1
Clear decline sweep 2-4		20.1		24.7
Clear decline sweep 2-5		32.5		43.8
Clear decline sweep 2-6		53.9		65.9
<i>Volume of self-reported delinquency at sweep 3</i>				
0-3 offences	47.8		62.5	
4+ offences	52.2		37.5	
		<i>% of those 4+ at sweep 3</i>		<i>% of those 4+ at sweep 3</i>
Clear decline sweep 3-4		20.3		23.3
Clear decline sweep 3-5		34.2		44.1
Clear decline sweep 3-6		49.7		64.9

A clear decline is defined as either from 10+ to 0-3, or from 4-9 to 0.

Nearly half (48 per cent) of males scored 4+ on volume of delinquency at sweep 2. Of these sweep 2 offenders, about one third (32.5 per cent) had clearly reduced their offending by sweep 5, and over half (53.9 per cent) by sweep 6. Among the girls, the proportion who had committed 4+ offences at sweep 2 was lower, and the rate of later desistance was higher. Taking sweep 3 as the baseline instead (bottom panel of table 1) half of the high-offending boys (49.7 per cent) had clearly reduced their offending by sweep 6, compared with two thirds (64.9 per cent) of the girls. Thus, a substantial proportion of high-volume offenders at sweep 3 (age 14) had clearly reduced their offending three years later, at age 16. The rest of this report examines the reasons why some young people reduced their offending whereas others did not.

PART 2: EXPLAINING CHANGE IN OFFENDING

This analysis takes sweep 3 (when self-reported offending was at its peak) as the baseline and aims to explain change in offending between sweeps 3 and 5, and between sweeps 3 and 6. Appendix 1 describes the method of statistical modelling that was used, and explains why this particular approach was used. A series of statistical models were specified with the aim of explaining or predicting the volume of delinquency at the later sweep (either sweep 5 or 6). Every model included the volume of delinquency at sweep 3 among the explanatory variables. This kind of model does not explain change in delinquency as such, it aims to explain or predict later delinquency, after allowing for the level of delinquency recorded at sweep 3. The model is not restricted to those whose delinquency fell: instead, it seeks to explain later levels of delinquency, whether high or low, after taking account of earlier levels. However, it is possible to test whether factors influencing change in the level of delinquency are similar or different depending on whether the initial level was high or low. This is similar to testing whether the explanations for a decline in delinquency are just the converse of the explanations for an increase.

The models were designed to test the influence of processes that intervened between the baseline measure of delinquency at sweep 3 and the outcome measure of delinquency at either sweep 5 or 6. Hence the measures of the explanatory factors were always ones taken at least a year before the outcome delinquency measure. Explanatory variables from sweep 4 were preferred when predicting delinquency at sweep 5, and those from sweep 5 when predicting delinquency at sweep 6. However, some of the explanatory variables had to come from earlier sweeps, where the measures had not been repeated later. Most of the explanatory variables related to individual cohort members and their families. However, the Edinburgh Study has also collected information about the 91 neighbourhoods in which cohort members live (see panel 3).

Panel 3: Charting Edinburgh's social geography

- 1991 census data were used to map the social geography of Edinburgh. Later this was updated using 2001 census data.
- Edinburgh was divided into 91 natural, homogeneous neighbourhoods. Boundaries were drawn to coincide with discontinuities in population composition, taking account of physical and transport features, and reflecting the identity of districts known by names.
- Police-recorded crime for three years was mapped onto these neighbourhoods.
- The social demography of the 91 neighbourhoods was summarized from census data, e.g. unemployment rate, proportion in local authority housing.
- Cohort members were geo-coded by place of residence, updated each year. Hence findings can be analysed according to the neighbourhood in which cohort members live.
- Neighbourhood characteristics and dynamics were described from a survey of residents, carried out in 2002 (sweep 4) which was entirely independent of the cohort of young people.

Four neighbourhood characteristics are considered in the present analysis:

1. Neighbourhood deprivation: an index based on census data reflecting the following five characteristics: % unemployed, % in local authority housing, % in overcrowded housing, % of families consisting of lone parents with children, % of population aged 16-24.
2. Rate of police-recorded crime per head of population. This measure includes a wide range of crimes, but not all crime categories.
3. Perception of neighbourhood disorder and incivilities, based on the survey of residents.
4. Satisfaction with the neighbourhood, based on the survey of residents.

These statistical models test the influence of four neighbourhood characteristics on change in levels of delinquency among cohort members. The statistical procedures used provide an accurate estimate of the influence of factors operating at both the individual and neighbourhood levels (for further details on the impact of neighbourhood clustering on Edinburgh Study data, see McVie and Norris 2006a, 2006b). The findings from this sequence of analyses are summarized in table 2 below. The table shows whether each variable had an effect on delinquency at sweep 5 or 6, after allowing for the effects of earlier delinquency at sweep 3, and for the effects of all of the other variables. In the table, a + sign means that the explanatory factor was related to higher delinquency later, whereas a – sign means it was related to lower delinquency later. The letters ns mean that the explanatory factor was not significant: in other words, there was no evidence that the factor had any influence on later delinquency. (See Appendix 1 for further details on the regression specification method.)

Table 2: Summary of findings from a sequence of regression models

Explanatory variables	Measure from sweep	Effect on delinquency at sweep 5	Effect on delinquency at sweep 6
<i>(a) Individual level</i>			
Higher volume of self-reported delinquency at sweep 3	3	+	+
Male	na	+	+
Manual/unemployed social class	2 & 4	ns	ns
Two-parent family	4/5	ns	ns
Commitment to school	4/5	ns	ns
Bonds with teachers	4/5	–	–
Parents' commitment to school	4/5	–	–
Parental monitoring (who the child is with, what he or she is doing)	4	–	ns
Parent/child conflict	4	+	ns
Impulsivity	3/5	ns	ns
Has boyfriend or girlfriend	4/5	+	+
Exclusion from school	4/5	+	ns
Number offence types known to the police	4/5	+	+
<i>(b) Neighbourhood level</i>			
Neighbourhood deprivation	4/5	+	+
Perceived neighbourhood disorder	4	+	+
Rate of police-recorded crime	4	+	+
Satisfaction with the neighbourhood	4	ns	–

Notes:

Measure from sweep 4/5 means that the sweep 4 measure was used to explain sweep 5 delinquency, whereas the sweep 5 measure was used to explain sweep 6 delinquency. The social class measure combines information from the young person's questionnaire at sweep 2 and the survey of parents carried out at sweep 4. The measures of parental monitoring and parent/child conflict combine information from the young person's questionnaire and parents' survey at sweep 4 (for further information, see Smith, 2004). The measure of parents' commitment to school is drawn from the parents' survey alone. The measures of exclusion from school come from the young person's questionnaire and not from official records. The sweep 4 measure reflects whether the young person had ever been excluded, whereas the sweep 5 measure reflects whether he or she had been excluded in the previous 12 months. Number of types of offence that became known to the police derives from the young person's questionnaire: where respondents said they had engaged in a particular type of delinquency, they were always asked whether this had become known to the police.

Perhaps the most important feature of these findings is that the characteristics of the neighbourhood had an effect on later delinquency after allowing for the level of earlier delinquency. The neighbourhood features that were related to change in delinquency include (in broad terms) the level of deprivation, as reflected by factors such as the rate of unemployment or the proportions of lone parents and of families in local authority housing; the level of police-recorded crime; but also local residents' perceptions of incivilities and disorder, and their level of satisfaction with the neighbourhood. It is not possible from these analyses to say which of these features of the neighbourhood is most important as an influence on changes in young people's offending as the four neighbourhood features analysed are quite strongly related to each other.

Whereas neighbourhood features such as deprivation, a high level of police-recorded crime, and perceived disorder made it less likely that young people would stop offending, the characteristics of the individual family had no similar effect. Thus, social class and family structure (i.e. whether or not both parents were present) were unrelated to later delinquency. These findings are interesting, because they suggest that the resources and dynamics of the neighbourhood are more important than the resources available to the individual family as an influence on behaviour change in young people.

As illustrated earlier, there was a substantial drop in self-reported offending between sweep 3 (when it reached its peak) and either sweep 5 or sweep 6. Accordingly, factors explaining change after sweep 3 are predominantly explaining a fall rather than a rise in delinquency. Nevertheless, the sequence of models distinguished between those with high and low levels of delinquency at sweep 3, and found that the explanations for change were similar, regardless of the earlier level of delinquency. Hence, the findings summarized in table 2 can legitimately be regarded as explanations for reductions in delinquency from the peak reached at the age of 14.

The findings support the theory that social bonds help to explain early desistance from offending. Bonds with teachers and parents (as reflected in parental monitoring and the level of conflict between parents and children) were associated with desistance from offending. The parents', but not the young person's, commitment to school was associated with desistance from offending. This finding supports the idea that 'bridging social capital' is an important factor in desistance. This idea is that parents' connections with important sources of power and influence make it more likely that their children will reduce their involvement in criminal behaviour.

Although impulsivity was quite strongly related to offending at one point in time,⁴ it was not a significant influence on desistance in the context of these models. On the whole, this argues against Moffitt's theory (1993), since according to her theory impulsivity should help to distinguish between adolescence-limited and life-course persistent offenders. Young people who had a girlfriend or boyfriend were more likely to maintain or increase their offending than those who did not. This finding fits with Moffitt's theory, if it is assumed that young people have a boyfriend or girlfriend in order to demonstrate maturity, just as they offend for the same reason, so that offending and having a partner tend to go together.

⁴ For example, the correlation between impulsivity and volume of delinquency (11 items) at sweep 5 was .388 (Spearman's non-parametric correlation coefficient).

Finally, we turn to the findings that are related to stigma and labelling as an explanation for continued offending. Exclusion from school was associated with continuing to offend at sweep 5, although not at sweep 6. This effect was weak, even though exclusion from school at any one point in time was strongly associated with offending. However, after allowing for the previous level of self-reported offending, the more often young people had been caught by the police, the less likely they were to reduce their offending— this was independent of their actual level of offending, as revealed by self-reports. A statistical refinement shows that being caught by the police had a particularly strong influence on whether young people gave up delinquency entirely: the more times they had been caught by the police, the less likely it was that their level of delinquency would be zero at either sweep 5 or sweep 6. This fits with the ideas of labelling theory (Lemert, 1967), which holds that people officially labelled as criminals tend to adopt a criminal identity, and find it very hard to escape from it subsequently.

CONCLUSIONS

The design of the Edinburgh Study brings together information about neighbourhoods with the lives of individuals growing up in them. Also, in describing neighbourhoods, it combines information from official sources, such as the census and the police, with survey-based information about the perceptions of residents. The analyses described in this report show that this method has worked. They show that whether or not young people reduced their offending depended partly on characteristics of the neighbourhood such as local levels of deprivation and police-recorded crime and perceptions of disorder and feelings of satisfaction among local residents.

The findings support the view of Sampson and Laub (1993), that social structure and social context influence the development of delinquency in young people. In fact, these contextual influences are shown to be more important than the circumstances of the individual family. Bonds with family and school are shown to be important factors, but it is likely that the neighbourhood context has an influence on the formation of these bonds.

Another striking finding is that young people who were caught by the police were more likely to persist in their offending than those who offended at a similar level but who were not caught. This fits with early findings from the Cambridge Study of Delinquent Development (Farrington, 1977; Farrington, Osborn and West, 1978). These findings support the view that youth crime can be contained by avoiding the punishment and hence stigmatization of young people during their formative years. This fits with Moffitt's (1993) theory that much youth crime is committed by adolescence-limited offenders who will grow out of crime if they are not damaged by interventions from the criminal justice system. Particularly striking is the finding from the Edinburgh Study that the chances that a young person will stop offending altogether are sharply reduced by contact with the police. This does not of course mean that the police and the children's hearing system should not intervene: some offenders have deep-seated problems that will not recede as they reach maturity; and serious offending has to be dealt with regardless of the consequences for the individuals involved. Nevertheless, these findings support the view that a policy of increased intervention by the juvenile justice system is unlikely to lead to a reduction in youth offending.

The findings suggest, instead, that improving the wider context in which young people grow up is more likely to improve the chances that they will 'mature out' of crime. It is not that the poverty or deprivation of individual families directly leads to youth crime. Rather, a wider context of social stress and disorder makes it less likely that young people will form strong social bonds and successfully effect the transition to mature adults who are capable of making informed moral choices.

APPENDIX 1: SPECIFICATION OF REGRESSION MODELS

The statistical models summarized in part two of this report are negative binomial regression models with zero inflation allowed to vary for each independent variable. The statistical package used to run the models was Stata. In the first sequence of models, the dependent variable was volume of delinquency at sweep 5; in the second series, it was volume of delinquency at sweep 6. This particular form of regression was chosen because of the nature of the dependent variable, which is highly skewed, with a substantial proportion (around 30 per cent) of zeros, a large number of moderate values, and diminishing but appreciable numbers of very high values. Logistic regression, which would mean simplifying the dependent variable to a simple opposition between high level offenders and others, was rejected on the ground that it would mean ignoring much of the information in the data. Ordinal regression, which has been used in many earlier analyses, is a fairly good solution to the problem. However, in preparation for the present analyses, we carried out a series of systematic tests of alternative model specifications. The main options that were reviewed were: ordinal regression, multiple linear regression after log-transformation of the dependent variable, Poisson distribution, negative binomial distribution, negative binomial distribution with zero inflation affecting the constant only, and negative binomial distribution with zero inflation allowed to vary for each independent variable. A series of tests showed that the last option always produced a model with a substantially better fit to the data than any of the others.

The following sequence was first run with sweep 5 delinquency as the dependent variable, then repeated with sweep 6 delinquency as the dependent variable. First, a basic model was specified, including only three independent variables at the individual level (sweep 3 delinquency, social class, and gender) along with one or more neighbourhood level variables. In the first version of the basic model, all four neighbourhood level variables were entered, together with terms for the interactions between sweep 3 delinquency and each of the other independent variables. The purpose of including the interactions was to find out whether the explanation for later delinquency was different depending on the level of earlier delinquency. As mentioned in the body of this report, these interaction terms were rarely significant, indicating that the explanations for change in offending were similar regardless of the initial level of offending. However, the basic model including all four neighbourhood level variables had to be abandoned, because wild values for the standard errors indicated that there was a problem of collinearity between these variables, which are quite highly correlated. The basic model was then re-specified, including each neighbourhood level variable singly, along with the three individual level variables. The re-specified models appeared to be robust. An obvious feature was that the four versions were very similar, and in each case the effect of the neighbourhood level variable was about the same (regardless of which particular one was included).

At a second stage, ten further individual level variables were added to one of the basic models (i.e. including just one of the neighbourhood level variables, the three original individual level variables, and ten more individual level variables). No interaction terms were included in these further models. At a third stage, the models were run again with non-significant variables removed.

Table 2 summarizes the effects shown by this sequence of models in the main part. The effects shown in the zero-inflated part have not been summarized in detail in the text. As well as the usual coefficient, the procedure produces a separate zero-inflation coefficient for each independent variable. Where this is significant, it indicates that the variable has a greater than average effect in influencing whether or not the outcome (later delinquency) will be zero. The main finding here was that being caught by the police had a very large negative zero-inflation coefficient, indicating that it greatly reduced the likelihood that the individual would not offend at all at the later sweep.

These models were specified in such a way as to allow for the fact that the cases are clustered into neighbourhoods. This means that the estimates of the standard errors, described as 'robust standard errors', allow for the pattern of clustering, so that the effects of the neighbourhood level variables are accurately estimated. This procedure does not, however, allow us to estimate the proportion of the variance that is explained at the neighbourhood and individual levels. Although this could be done by the multi-level programme, MLWin, negative binomial regression with zero inflation cannot be accommodated at the same time. In our view, the chosen procedure represents the best compromise given the software that is currently available.

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