

PATTERNS OF DEVIANCE UNDERLYING THE AGE-CRIME CURVE: THE LONG TERM EVIDENCE

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Abstract

The high prevalence of delinquent behaviour in the teenage years is well documented. The phenomenon that is the age-crime curve, which tends to peak in the mid to late teens, is widely agreed to cross both jurisdictional and temporal boundaries. However, analysis at such an aggregate level conceals important underlying differences between individuals and within different offence types. Furthermore, shifts in prevalence rates are not necessarily mirrored by such consistent changes in incidence rates (see Farrington, 1986). The plethora of cross-sectional studies carried out have been unable to shed light on the nuances of individual offending careers.

Using longitudinal data collected from the first five sweeps of the Edinburgh Study of Youth Transitions and Crime, this paper shall explore patterns and trends in delinquent behaviour of a single age cohort from 12 to 16 years of age. Trends in both prevalence and incidence shall be explored in an attempt to explore the relationship between these two fundamental aspects of offending behaviour. And some exploratory work will be done to identify distinct groups of offender based on their involvement in delinquency over the course of their early teens.

Introduction

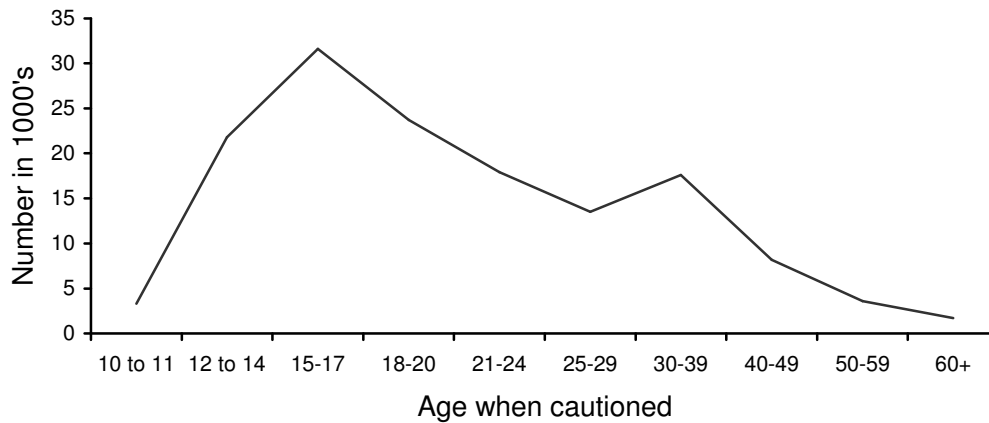
The existence of the age-crime curve has become one of the least contended issues within criminology. Hirshi and Gottfredson (1983; and Gottfredson and Hirshi, 1990) have argued that during a long period of change and development, the age-crime curve remained constant – following a closely similar pattern across different time periods, amongst different populations and even between the sexes. Certainly, many sources of official criminal data – predominantly cautions and convictions – have consistently shown there to be a sharp incline in offending behaviour during early adolescence (from around the age of criminal responsibility), peaking during the mid-late teenage years and then declining, steeply at first (to the mid 20s) and, thereafter, more steadily (Farrington, 1986; 192-5).

The reality is not quite so clear cut. Despite broad similarities in appearance, the ubiquitous curve does in fact vary quite widely in specific terms: the peak may be more or less sharp, the peak age may be higher or lower, the skew may be more to the left or right, and so on. All of these differences have definite significance in terms of interpretation and should not be ignored.

To illustrate the existence and form of the age-crime curve, Figure 1 reveals the most recently published data on the number of cautions issued in England and Wales during 2002 by age band (Home Office, 2003). The first point to note is that the banding

is much narrower for the younger age groups than the older, but the overall pattern is unambiguous. The characteristic peak emerges between age 15 and 17; however, there is another mini-peak around age 30 to 39. This may be an artefact caused by aggregation of the data into age bands, or it may reflect a surge in late onset. Whatever the precise reason, it is true to say that such oddities tend to go unexplained by data analysts so long as the dominant teenage peak is evident.

Figure 1: Number of offenders cautioned in English courts in 2002, by age



At a practical level, getting access to the data necessary to analyse such trends is highly problematic. Published data from official sources tend to vary in terms of availability and age-banding. For example, data on criminal convictions published in the same Home Office report aggregated everyone aged 21 or over into one group, making it impossible to identify trends in adulthood. Once again, it seems, so long as the peak in the teens is evident the patterns within the remaining age groups are irrelevant.

There are other frailties in the official sources of data we use to evidence this relationship. Twenty years of national crime surveys have routinely demonstrated the high level of crime absent from the police recorded crime statistics (for most recent reports see Simmons and Dodd, 2003 and MVA, 2002; also see Anderson, 1999). Levels of attrition in the justice process mean that the proportion of crimes recorded for whom someone is eventually convicted is fractional. And convictions can represent several crimes and often occur long after these were committed. Therefore reliance on either arrest, caution or conviction data appears, at several levels, to be fundamentally flawed.

Self-report studies are now widely regarded as a more accurate source of information on offending patterns (see Junger-Tas et al, 1994). They provide a potentially much more rich source of information about trends in offending, yet they are far and few between, particularly in the UK, and analysis of the results has tended to be simplistic and descriptive. Cross-sectional data from both the 1992 youth crime survey reported by Graham and Bowling (1995) and the 1998/99 Youth Lifestyles Survey (Flood-Page et al, 2000) present both the prevalence and frequency of offending within different offence types, but fail to explore the intricacies of the relationship between the two. An exception is the Cambridge Study of Delinquent Development, which has provided a far more sophisticated analysis of the trends in offending (Farrington,

1990) and continues to do so; however, this study is rather limited in its coverage and excludes female offending completely.

Explaining the age-crime curve is difficult because differences reflect both developmental change within individuals and historical shifts over time. Farrington (1986, 1990) distinguishes between 3 effects: 'age effects' which occur with movement through the life-cycle e.g. maturity, puberty; 'period effects' which are historic changes affecting all individuals, regardless of age e.g. availability of drugs; and 'cohort effects' that affect all individuals of the same age who share a common experience. Disentangling these effects is difficult since cross-sectional studies hold period constant but cannot track aging or cohort effects. Longitudinal studies hold the cohort constant and can track the process of aging, but cannot examine period effects (although this could to an extent be achieved through accelerated cohorts).

In addition to the problem of attempting to disentangle these effects, we must recognise that the age-crime curve is a cumulative product of many different offence categories, which in themselves display great variations in the age crime relationship. Soothill et al (2004), for example, found the peak age of conviction for some crime types, such as burglary, to be far lower than others at around 16 or less. Motoring and drug offences peaked between 21-25 before declining; whereas convictions for fraud and forgery also peaked between 21-25, but remained high until 30. Though the peaks all occurred within young adulthood, the patterns and trends were very different.

There are also opponents to the fundamental principles underpinning the social construction of the crime rates. Tremblay and Nagin (2004) in their study of youthful aggression, for example, believe that if early misbehaviour and conduct problems were to be taken into account, the age-crime curve would start far earlier and peak far less sharply in adolescence. They assert that physical aggression peaks around the age of 2, and subsequently shows distinct individual trajectories, but a general downward trend. This issue is not developed further in this paper, but it is of major importance as this type of work represents a shift in emphasis of the developmental understanding of violence (Fonagy, 2003).

The aim of this paper is to review two of the key debates surrounding the age-crime curve. Firstly, the question of whether the curve is explained by increases in prevalence, incidence or both? And, secondly, does the age-crime curve require to be disaggregated using offence typology or offender taxonomy, or is a general theory of crime sufficient? Thereafter, using data from the Edinburgh Study of Youth Transitions and Crime, I want to explore some of the intricacies of the age-crime curve by comparing prevalence and frequency of offending and examine some differences in offence and offender types.

Key debates on the age-crime relationship:

Prevalence versus incidence

The age-crime curve is typically presented as a count of the total number of crimes committed within a specific time period. It may also be presented in terms of prevalence of offending, i.e. as a count of the number of people within the population who

have offended (or been cautioned or convicted). The shape of these two curves tends to be broadly similar.

A debate is ongoing about whether it is the prevalence of offenders or the incidence of individual offending that most readily explains the age-crime curve (see Smith, 2002). The debate is essentially this: is the age-crime curve for the total count of offences committed (or total number of convictions made) accounted for by the known increase in prevalence of offenders during the same time period, or is there a greater causal influence of an increased frequency of offending amongst offenders.

Since the early 80's, Gottfredson and Hirshi (1986) have stated that there is simply no point in studying the individual's frequency of offending because crime as a function of age follows a 'unimodal' curve, the form of which is invariant over time and place. However, Blumstein et al (1988), in their review of data from the Glueck's longitudinal Boston cohort, found that the number of arrests per person remained constant over time, whereas the total number of arrests fell. They concluded that the fall in the number of arrests after the peak age of offending was due to a decrease in prevalence but there was no reduction in frequency amongst the active offenders.

Farrington also found that the peak number of convictions amongst his longitudinal cohort was primarily affected by prevalence rather than frequency, but problems with sample size and statistical power meant the results were not conclusive. Nevertheless, he contended that the age crime curve reflected variation in prevalence rather than incidence, as the age-crime curves for individuals did not resemble the aggregate curve, and incidence did not change consistently over the course of a criminal career (see Farrington, 1986).

Returning to Farrington's data 10 years on, Nagin and Land (1993) used new statistical modelling methods to understand patterns of convictions. Dividing the sample into 4 groups (those never convicted and adolescent limited, low rate chronic and high rate chronic offenders) they found that the frequency of offending rose and fell gently among the chronic groups but sharply amongst the adolescent limited group from age 10 to 30. This led them to conclude that both prevalence and offending frequency contributed to the overall pattern of convictions.

The balance of existing evidence, then, suggests that the age-crime curve largely reflects changes in prevalence of offending rather than frequency, therefore the sharp rise in crime rates in the teenage years is due to an increase in new recruits rather than an increasing proliferation of offending amongst existing offenders. However, Nagin and Land showed that this was true for some offenders more than others. And Blumstein (1994) emphasised that "it is important to recognise that the aggregate crime rate is the result of the combined effect of participation and frequency".

Unfortunately, the bulk of the data underpinning this debate are from official sources rather than self-reported offending. And Sampson & Laub (2003) argue that incidence of offending varies greatly for some types of crime and some types of offender and that this is characteristic of the enormous heterogeneity in individual criminal behaviour over the life-span. The debate continues, but it is clear that much more evidence needs to be amassed from self-report studies on the incidence of offending and its relative importance in understanding crime rates.

Offence and offender typologies versus a general theory of crime

Treating crime and criminals as homogeneous groups makes an assumption that, despite differences in nature, there are basic similarities which connect behaviour and age. At a theoretical level there are arguments for this position (see Sampson and Laub, 2004), yet intuitively it is hard to connect vandalism and paedophilia, or computer fraud and domestic violence, other than simply as breaches of the criminal law. Francis et al (2004) argue that the focus on totality or frequency of offending is misleading as it encourages the view that patterns of crime (or convictions) are static and unchanging. However, there are enormous differences in offence types and patterns of offending, so a typology approach is far more useful for understanding crime and its causes.

Classification of crime and criminals is not new – it has been common since the 1950's, but started even earlier with people like Cesare Lombroso. This early work was concerned principally with comparing forms of criminal behaviour, using both simple empirical data and a fixed theoretical approach. More recent work has taken both a definite methodological shift towards the use of quantitative data and advanced statistical methods, and a theoretical and semantic shift away from rigid 'typologies' in favour of a more flexible notion of criminal 'pathways' and 'trajectories' (Sampson and Laub, 1993).

Nevertheless, the research results reveal some commonalities. In the early 1970s Wolfgang et al (1972) showed that most youth offenders were versatile, with only some specialisation. In the 1980s, Farrington and others (1988) developed a more analytical approach – using the 'forward specialisation coefficient' – to produce results that broadly agreed with Wolfgang's findings. But he identified considerable variation by offence type, with greater specialisation in offences such as burglary and vehicle theft, and less for vandalism, weapons and trespass. Research has generally shown greater versatility than specialisation amongst all age groups, although specialisation in some crime types does increase with age.

In terms of offender taxonomy, one of the most influential authors of recent years is Terrie Moffitt (1993), who classified 2 distinct categories of offender: the life-course persistent offender and the adolescent limited offender. According to Moffitt, offending amongst the life course persistent group starts early in life and continues throughout the life course, but its forms of expression, the social reactions it receives and the way it is dealt with, vary at different stages of the life cycle. While adolescent limited behaviour increases rapidly in adolescence, peaks and then declines. Moffitt believes the age-crime curve is the result of super-imposing the rate of offending over time amongst one group over the rate of offending over time amongst the other, with the adolescent limited group being almost entirely responsible for the teenage peak

However, Moffitt's approach has been criticised for being too simplistic and not differentiating sufficiently between offending groups. Nagin and Land's analysis of the 4 groups, mentioned earlier, also found that while the adolescent limited group differed on key aspects from low and high rate chronic offenders, they also shared key characteristics with them and differed significantly from the never convicted group. Moffitt (1997) responded to this by arguing that the differences between adolescent limited and life course persistent offenders were predominantly in terms of psychopa-

thology. However, Fergusson et al (1996) conceptualised offending behaviour as a continuum with adolescent limited at one extreme and life course persistent at the other, and considerable blurring in the middle.

Recent statistical advances have seen the application of a semi-parametric group based approach to understanding the underlying trajectories of crime. Francis et al (2004) applied the clustering capability of latent class analysis to the Home Office Offender's Index to describe offending patterns and investigate within-individual changes over time, allowing more advanced investigation of criminal pathways and crime specialisation.

Studying conviction histories of the 1953 birth cohort up to 1993 (age 40), within 5 year age bands, Francis et al demonstrated that patterns of offending varied markedly both in terms of diversity and specialisation. Nine offending classes emerged for males, with quite distinct age profiles for different types of offending, and specialisation of offending increasing with age. Only three offending classes emerged for females, with no distinct age profiles or changes over time. They claim that the fact that clusters emerged demonstrates that offending is patterned – since the clusters show far stronger patterns than individual offence types.

Francis et al's work does provide evidence in support of an offence typology approach. However, Sampson and Laub (1993, 2004) have rejected this type of work on two accounts. First, they reject it on conceptual and pragmatic grounds. They assert that the idea that offences and offenders can be dissected and packaged into neat groups is flawed and, in practice, is impossible to do. They believe the fundamental causes of crime are the same for everyone, even though the offending pathways (single or multiple) between individuals are different, therefore a general theory of crime is most appropriate. This is based on the assumption that, while the manifestations of crime may differ, the same general processes underpin them. They reject the assertion that distinct offender groups have distinct causal mechanisms and argue that many of these typologies are identified retrospectively, based on outcome, rather than prospectively. Their second objection is with the statistical methodology itself. They assert that the robustness of latent class modelling has not been sufficiently validated and, indeed, found considerable variations in trajectories within their own data depending on how they dealt with certain characteristics of the cohort (Eggleston et al, 2004).

Clearly there are many issues that remain unresolved in terms of the exact reasons underpinning this ubiquitous curve. Yet, it is routinely taken for granted as a criminological given, and commonly used as a political tool for justifying the development of crime control policies and initiatives targeted at the young. It is hard to see how broad policies and specific initiatives can be effective if they do not understand such simple issues as whether the age-crime curve is explained by prevalence or incidence. This paper argues that it is not valid to examine the curve at a cumulative level, and that it must be disaggregated to its constituent parts to fully understand the multifarious nature of juvenile offending, and thus begin to do something about it.

Findings from the Edinburgh Study

The analysis for this paper uses data from the Edinburgh Study of Youth Transitions and Crime, a contemporary longitudinal study of the offending careers of over 4000 young people in the Scottish capital (for a full description of the aims, study design and methods of this study, see Smith and McVie, 2003). The approach of the analysis is exploratory and simplistic, in comparison to the many complex statistical modelling approaches prevalent in criminal careers research. However, it is useful in demonstrating some of the problems with the current conceptualisation of crime trends at an aggregate level. Further statistical modelling is currently being developed.

So what might the Edinburgh Study contribute to the debate?

- The study has collected extensive data on a large cohort of young people, providing detailed analysis (on prevalence and frequency of offending) at many levels.
- Data collected includes a broad range of individual, familial, social, peer-related and neighbourhood-related characteristics.
- The research can provide comparison of both official and self-report data to illustrate points of similarity and difference between the two.
- The research has a prospective design with long term predictive capability.

The data I will be presenting shows the offending patterns of the cohort across 5 of the 6 sweeps conducted to date, with analysis restricted to those individuals who participated in all 5 sweeps (n=3523). Analysis is focused on the prevalence and incidence of involvement in twelve particular types of offending or anti-social behaviour which respondents were asked about at all 5 sweeps.¹

A count was made of the total number of incidents of delinquency reported by cohort members at each sweep. For methodological reasons, a closed question was asked to determine the number of times individuals had offended in each way. This grouped together those who had offended between 6 and 10 times (assuming a conservative minimum of 6), and capped the maximum number reported at 11 for those who said they had done things 'more than 10 times'. The disadvantage of this approach is that an accurate count of the total number of crimes committed by the cohort is not possible. In any case, the accuracy of individual's responses after a certain level is questionable, and an advantage of our approach is that it prevents spurious outliers in the data from skewing means and distributions. I, therefore, present a 'conservative minimum' total volume of incidents of offending, which is more than sufficient to meet the criteria of 'persistence' used in most other studies or by youth justice agencies.

Figures 2a and 2b show a very familiar pattern: the minimum number of incidents of offending reported by cohort members at each of the first five sweeps rises steadily from age 12 (the first sweep) to age 13, then steeply to age 14, then declines to age 16. Figures 2a and 2b differ in one important respect: the first displays the mean volume of offending reported by individual offenders; while the second shows the per-

¹ These were fire-setting; driving stolen vehicles; theft from vehicles; physical violence; theft using violence; shoplifting; carrying a weapon; breach of the peace; non-fare payment; housebreaking; vandalism and graffiti (these are described more fully in Appendix A of Smith and McVie, 2003).

centage of cohort members reporting involvement in at least one of the twelve offence types included in the analysis. Interestingly, in our analysis, the mean volume of offending appears to explain far more of the variance in the overall count of incidents reported than the proportion of people involved in offending. In fact, prevalence over the first three sweeps is incredibly stable and the variance in the total count appears to be explained solely by offending frequency. In the later two sweeps, prevalence and incidence appear to have more of a combined effect on the total count, since neither line matches the descent of the total count absolutely.

Figure 2a: Minimum no. of incidents and mean volume of offending

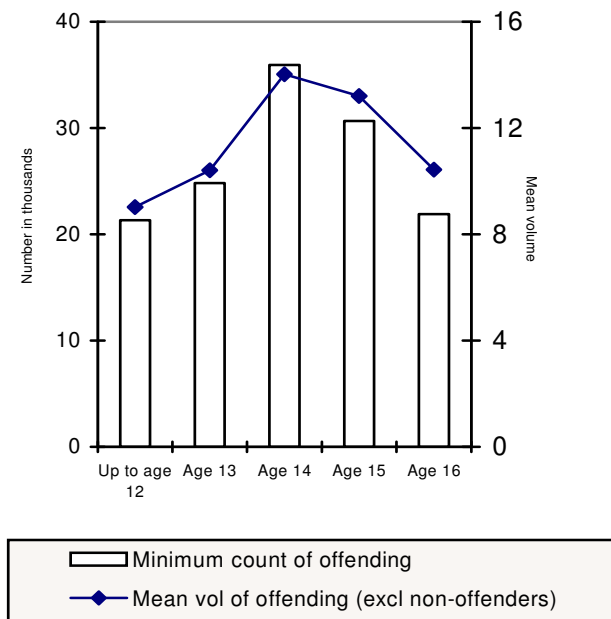
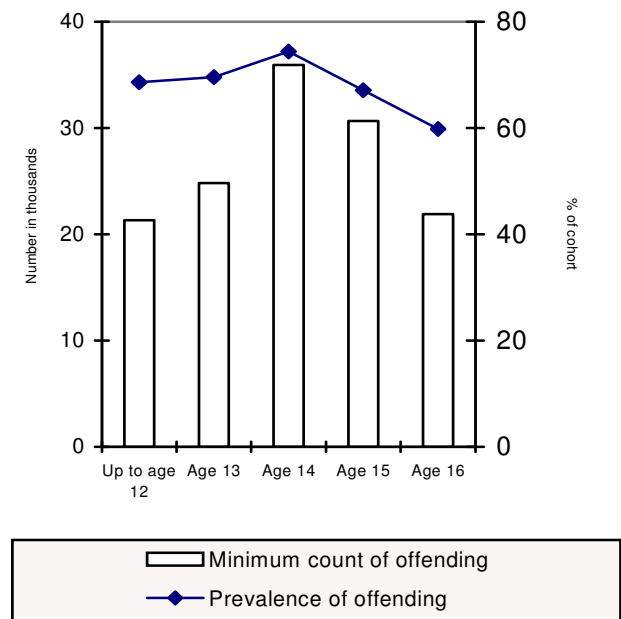


Figure 2b: Minimum no. of incidents and prevalence of offending



Our measure of prevalence does not show the typical age crime curve associated with offending prevalence. The level of kurtosis (or peak) is far more shallow, suggesting a much more stable picture of participation in the early teenage years. This is partly an artefact of the reference period for the first sweep, which was much broader than the subsequent sweeps ('ever' rather than 'the last year'), therefore, the numbers at this point are no doubt inflated to a greater or lesser extent (offence-specific analysis presented later shows the effect is greater for some crime types than others). Our peak age for both prevalence and frequency of offending also appears to be somewhat lower than some other studies of this type, although the Youth Lifestyles Survey did show that overall prevalence of offending amongst both boys and girls peaked at age 14-15 (and peaked again for boys at age 18-21) (Flood-Page et al, 2000).

Looking at the picture overall, the characteristic steep rise in the crime count curve amongst the Edinburgh study cohort appears to be more readily explained by the sharp peak in offending frequency rather than prevalence of offending, whereas, the decline appears to be based on a combination of the two factors. However, this overarching profile conceals important differences in both prevalence and frequency at the level of specific offence types. There is insufficient space here to look at every type of delinquent behaviour covered by the Edinburgh Study, so focus shall be restricted

to four which demonstrate the point. The selected offences presented in figures 3a to 3d, below, demonstrate four different general trends which were mirrored by other items included in the survey, although this is not presented as an offence typology.

Figure 3a shows the relationship between prevalence and incidence of offending in self-reports of fare dodging (defined as travelling on a bus or train without paying or paying too little). Clearly, there has been a steady increase in prevalence of this quite trivial, yet not uncommon, form of delinquency, which has not yet peaked at age 16. At the same time, there has been a parallel increase in frequency over the same period, which almost exactly matches the trend in prevalence. In other words, not only are more individuals involved in this form of behaviour, but those who are report doing so increasingly more often with age (possibly reflective of their growing social mobility).

The pattern for fighting (defined as hitting, kicking, punching or attacking someone with the intention of really hurting them) is quite different. Figure 3b demonstrates that both the prevalence and frequency of fighting, using this broad definition, declined quite markedly during the early teens. The apparent decline between age 12 and 13 is likely to be an artefact of the longer reference period at age 12, however, it seems clear that this form of behaviour plateaued around age 13 to 14, then declined sharply. A similar pattern emerges for frequency of offending, although the 'peak' is more clearly demarcated at age 14 (the same problem of reference period applies to volume of offending), and the decline in frequency of offending is not nearly so steep as the decline in prevalence. This suggests that those who continued to be involved in fighting had a reduced frequency of violent behaviour overall.

Some other forms of offending showed a distinctly different pattern in prevalence and frequency of offending. Figure 3c shows the example of fire-raising, which showed a staggering increase in prevalence between age 12 and 13 (despite the extended reference period at age 12), followed by a fairly steep decline after age 14. The trend in frequency showed a much more consistent pattern, however. There was an overall peak at age 14 in frequency, but the evidence suggests that the volume of offending amongst those joining and leaving the 'pool of offenders' did not differ dramatically from those who stayed.

Finally, I explore the example of weapon possession (defined as carrying a knife or other weapon with you for protection or in case it was needed in a fight). In this case, offending prevalence showed a fairly steep incline from age 12 to age 14, where it peaked, and then declined rather more steadily. Mean volume of offending also showed an increase from age 12 to 14, but this trend-line continued up to age 16. In other words, despite a drop in the number of people involved in offending, the number of weapon offences committed continued to increase showing a dramatic escalation in individual behaviour.

All of the other forms of delinquency analysed for this paper fell into one of these four broad categories; however, there were discrete differences between each offence type. So, at the aggregate level, prevalence was more stable than volume of offending, leading to the conclusion that incidence contributes more highly to the overall totality of these 12 forms of delinquency than prevalence in the early teens. However, it is clear that the individual pieces of the jigsaw are complex and this neat overall

picture masks these different underlying trends. For some crime types, volume of offending actually showed more stability than prevalence, while for others, there were remarkably divergent patterns where prevalence and incidence moved in opposing directions.

Figure 3a: Prevalence and mean volume of fare-dodging

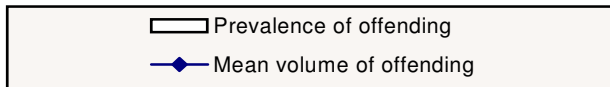
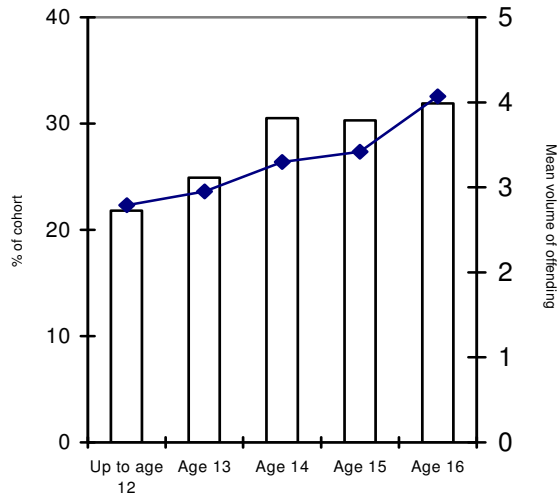


Figure 3b: Prevalence and mean volume of fighting

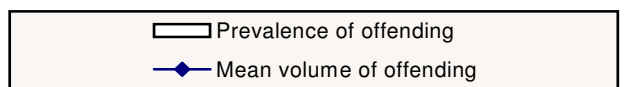
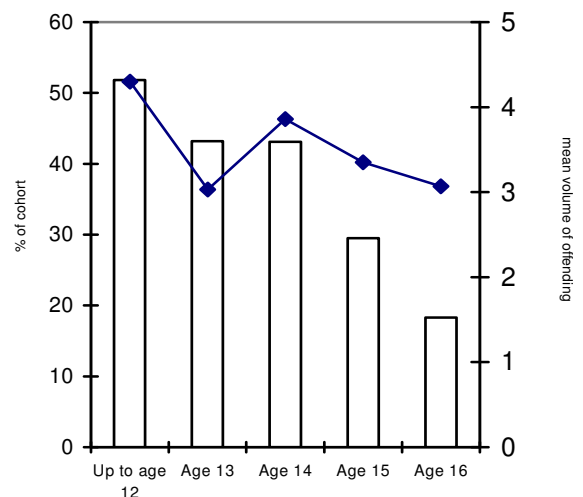


Figure 3c: Prevalence and mean volume of fire-raising

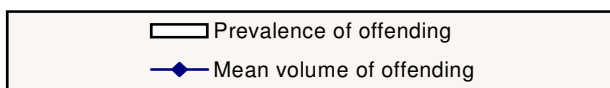
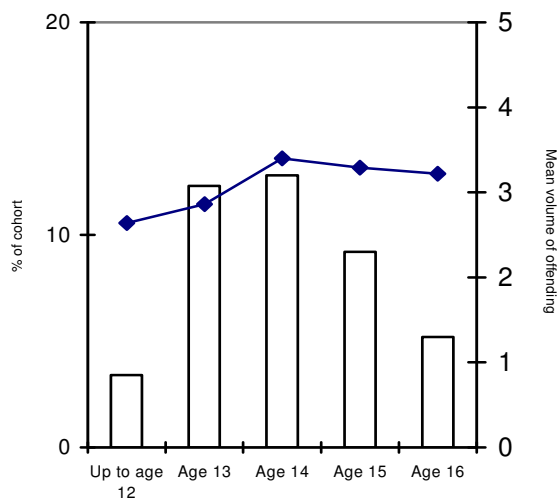
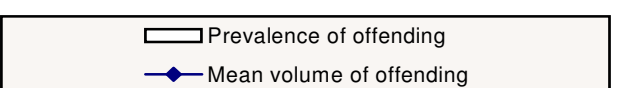
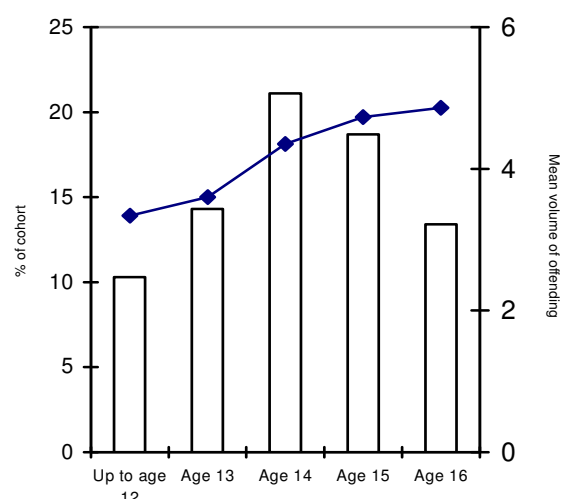
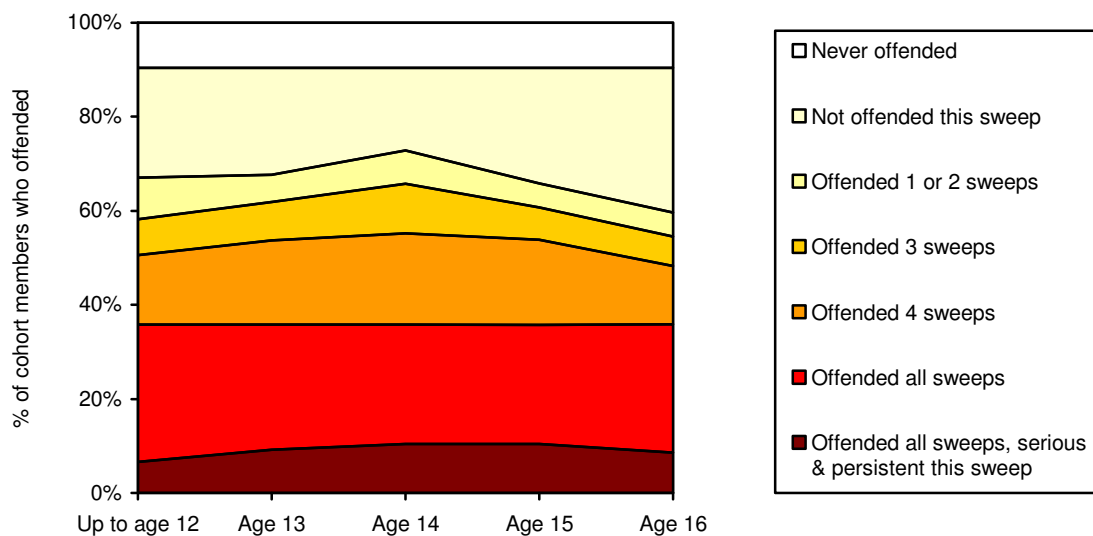


Figure 3d: Prevalence and mean volume of carrying a weapon



So how constant is the population of offenders over time? Is it the same people offending constantly over time, while the non-offenders remain the same? Thinking about Moffitt's taxonomy, I derived a picture of prevalence which distinguishes between offenders in terms of the number of sweeps at which they said they had offended. Figure 4 shows that 1 in 10 cohort members did not report offending at any sweep of the study. At the other end of the spectrum about a third of the cohort reported offending at all 5 sweeps. A significant minority at each sweep said they had not offended, but were noted as being offenders at other sweeps of the study. A fairly sizeable proportion in the middle of the chart (various shades of orange) reported offending at a few sweeps of the survey – these might loosely be described as the 'adolescent limited offenders'.

Figure 4: Prevalence of offending at each sweep, by number of sweeps at which offending was reported



Looking in a little more detail at the group who had offended across all sweeps, we can identify a smaller group who reported persistent offending (in this case defined as more than the mean number of incidents reported each year) including at least one serious offence. These might be defined as 'high level chronic offenders', and they certainly appear to show amazing stability in terms of numbers. However, the number of this group who reported such behaviour at every sweep fell to just 1.1% of the cohort – just a ninth of the number who had been part of this group at any time (9.9% of the cohort).

Conclusion

Much emphasis is placed on the aggregate patterns of crime prevalence or frequency produced regularly by research on offending behaviour, to the extent that the age-crime curve has become a reassuring icon of criminological research. However, what remains relatively under-researched is the extent to which this is explained by changes in the prevalence of offenders or changes in individual frequency of offending is unclear. Self-report data from the Edinburgh Study suggests that changes in offending frequency have most impact on crime rates at the aggregate level, since prevalence of offending stays quite static over the early teenage years. However, disaggregated data

presented by crime type shows enormous divergence in terms of both prevalence and frequency of offending, proving that it is too simplistic to identify one or the other as the primary contributor. The complex nature of the patterns in prevalence and frequency of offending for different offence types implies that a 'general' theory of offending is unwise, as it takes no account of offence classification or attempts to understand the differential groupings of offence or offender. Contra Sampson and Laub, it appears essential that a typology is developed, at least to understand juvenile offending which is diverse and multifarious in nature. To be most effective, crime control policies must take into account the dynamic and multi-faceted nature of youth offending demonstrated here.

Looking simplistically at the extent of cohort member involvement in offending across the first five sweeps of the Edinburgh Study, I have identified different groups of individual who clearly differ in terms of their criminal trajectories, which strongly suggests the need for some form of offender taxonomy approach. Of particular interest, in this era of preoccupation with persistent offenders, are the third of individuals who admitted offending at all 5 sweeps. Nevertheless, even within this group, there was considerable drift in terms of persistence and seriousness of offending, with only 1% of the cohort overall meeting our definition of serious and persistent offenders across all 5 sweeps. In addition, the offenders from our study who might be described as 'adolescent limited' form a far more complex group than Moffitt contends and require much more scrutiny. They span the range of one-off offender through to sporadic but serious offender. This lends support to the proposition that there is a continuum of offending across which boundaries are blurred.

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