LANCASTER UNIVERSITY

Developing Measures of Severity and Frequency of Reconviction

FINAL REPORT
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1. Introduction

In much Home Office research, particularly in evaluation studies, the success of an intervention or programme is commonly measured by whether offenders have recidivated – that is, whether they have been reconvicted or reoffended within a fixed follow-up period, usually two years. For example, Home Office advice provided by Colledge *et al.* (1999), in their *Programmes for offenders: guidance for evaluators* refer to reconviction as the primary outcome measure for an offender.

There have been two common data sources used for assessing recidivism. Colledge et al. (1999) discuss the use of the Offenders Index for measuring recidivism. This data source provides information on convictions but provides limited information on offending and does not include information on cautions, warnings and reprimands. However, more recently, the Police National Computer has provided an alternative source of data, and this has enabled researchers such as Wilcox et al. (2004) to use a measure of reconviction that includes cautions and convictions and what they termed as resanctioning.

However, it has also been recognised that whether or not recidivism has occurred within a fixed period is a rather crude outcome measure.   Other authors have suggested examining the time to recidivism, the nature of the re-offending, of measuring the number or frequency of recidivism within a fixed period or of assessing the seriousness of the recidivism. Hence, going beyond the straightforward dichotomy of recidivating or not produces various options that are potentially interesting but need to be investigated with care.

This report examines the scope for focusing on the seriousness and frequency of recidivism and presents methodology for determining how to measure offence seriousness, and how to measure frequency of offending. It also discusses the advantages and disadvantages of combining these two measures into a combined seriousness/frequency score. However, one needs to recognise that the task of providing alternative measures of recidivism is not simply a technical exercise, for there are both philosophical and practical issues to confront.

Hence, while the main body of the report focuses largely on the feasibility of producing the alternative measures and provides some solid evidence of developing these approaches (sections 3-5), the philosophical issues – which embrace definitional, conceptual and moral concerns – are not overlooked (see section 2). Furthermore, some of the practical issues of introducing these measures are recognised in the final section (section 6). First, however, what are the stated aims and objectives of the work.

1.1 Aims and Objectives

This aim of this research is to identify an approach to measuring recidivism that goes beyond a simple success/failure dichotomy. It aims to devise suitable methodology

to measure crime seriousness and frequency so as to enable these measures to be used in a routine manner on datasets originating from the Police National Computer.

The study has four specific objectives:

- *To review and critically appraise previous analyses conducted on severity and frequency.*
- *To develop a range of seriousness and frequency measures.*
- *To test each measure and supply evidence to verify the strengths and weaknesses of each approach*
- *To consider a combined measure for seriousness and frequency of recidivism.*

1.2 Plan of the Report

We present this report in six sections:

Section 1.   **Introduction.**

Section 2.   **General issues surrounding seriousness and frequency.** This section focuses on definitional and conceptual issues. It includes a brief literature review and a description of the dataset.

Section 3.   **Developing an offence seriousness scale.** This section discusses the methodologies for constructing an offence seriousness scale from official data and identifies the most appropriate approach in the present context. It provides evidence of the development of an offence seriousness scale that covers all offences. Illustrative examples are discussed in the text and the full version is shown as Appendix A and B.

Section 4.   **Measuring frequency of recidivism.** This section considers various approaches for measuring frequency of recidivism. It provides evidence of the usefulness of these competing measures. Again illustrative examples are provided within the text.

Section 5   **A composite measure of seriousness and frequency.** This section focuses on how the two measures might be usefully combined and the implications of doing so.

Section 6   **Conclusions.** This final section both summarises the findings and considers some of the moral and practical issues in relation to introducing these measures

2. General issues surrounding seriousness and frequency

Before considering our approach to the questions posed under 'Aims and Objectives', there is some ground-clearing work to complete. First of all, we need to establish some definitions, so it is clear what we are talking about when we introduce certain terms. However, definitions obtrude into some important conceptual issues that cannot be by-passed. 'Seriousness' is a complex term and there is no agreed definition – if there was, then much of this report would be redundant! Hence, we need to consider whose viewpoint is sovereign – whose version of reality are we embracing? 'Frequency' is less complex as it is a quantitative rather than a qualitative term, but what one is counting needs to be addressed.

2.1 Definitions

We attempt here to clarify our use of various terms.

Seriousness – We restrict the use of 'seriousness' to offences. Offence seriousness can either be unadjusted or raw seriousness measures, or adjusted for other covariates such as age and previous convictions.

Severity – We define the term 'severity' to relate to sentences awarded.

Court appearance - Sometimes also termed sentencing occasion, this is an appearance before the court at which an offender is sentenced for one or more offences.

Target conviction - In recidivism studies, this is the conviction that leads to the offender being included in the study. The target date is usually taken to be the date of sentence, but can be taken to be the date of release if the offender is placed into custody and such information is available.

Reconviction (date of) – A court appearance at which an offender is sentenced; more specifically, the sentencing date, and relates to an offence taking place after the target date.

Resanction (date of) - A court appearance at which an offender is found guilty and is sentenced, or the date on which an offender is given a caution, a warning or reprimand and which relates to an offence taking place after the target date.

Proven reoffending (date of) – The earliest recorded date after the target date at which an offender has reoffended, where that offence has led to a court conviction.

Accepted reoffending (date of) – The earliest recorded date after the target date at which an offender has reoffended, where that offence has led to a court conviction, a caution, warning or reprimand.

Finally, we need a portmanteau term that can be used to talk about the subsequent criminality of an offender, no matter how it is measured. We use the term '**recidivism**' to refer to a return to crime, whether measured by offending, conviction, or other means.

The definitions used here are very much part of a working terminology and cannot be considered definitive, for the concepts are complex and are used in different ways by different authors. However, this section summarises what we mean by these terms. We now move on to the complexity of defining 'seriousness' and 'frequency' in a more systematic way.

2.2 'Seriousness' – exploring different standpoints

'Seriousness' is a complex term that can have various meanings. However, it is not totally relative. In other words, there are understandings about the concept of 'seriousness' that are shared. In seeking some purchase on these shared understandings, we need to recognise some important distinctions about different views or standpoints of what constitutes seriousness. There are essentially three relevant standpoints, namely, the *public* view, the *official* view and the *private view.* Of course, these standpoints interact but they are analytically distinguishable.

First, the private view. Everyone will have a private view of seriousness, but it may be difficult to unearth this private view if it is different from what people say or do. For example, a person may think that 'burglary' is a more serious offence than rape, but – recognising that this is nowadays a discrepant view from the norm – may be unwilling to express this view. Interestingly, a century or so ago, offences against property would have been thought to be more serious than offences against the person and such a view would have perhaps been more readily expressed. This highlights the point that notions of seriousness may change over time. However, the more important point is that the *private* view – that may interest sociologists or anthropologists – is not directly of interest in this study. We are more concerned with what people say or do and to understand this, we need to probe either the *public* view or the *official* view.

The distinction between the *public* view of what constitutes a serious offence, and the *official* view of what constitutes a serious offence is straightforward. The *public* view is that of the public, while the *official* view is that of officials. The latter can alternatively be seen as the criminal justice /lawmakers /judges/ magistrates/ Home Office view. It is highly probable that the public and officials will have some considerable agreement but also some different views of what constitutes seriousness at the margins. For example, the public might label insurance fraud as 'not serious' as the crime is apparently victimless, and might also consider the offence of perjury as towards the less serious. In contrast, those with a more vested interest in seeking to protect the state and financial institutions and the majesty of the law and the courts are likely to have a different view. It would be equally unwise to believe that the officials are all likely to agree any more than the members of the public are likely to agree. Nevertheless, it is important to decide which constituency one is trying to probe in relation to their versions of seriousness.

Previous attempts at probing 'seriousness' have, in fact, divided at this point. Some have used the public as their point of reference, whilst others have used some form of official sources as their data. Before reviewing this work, however, one needs to recognise the methodological differences that underpin these approaches to probing 'seriousness'. Probing the *public's* view of 'seriousness' inevitably involves the use of surveys (which, in turn, involves the respondents in *saying* how they rank 'seriousness'). In contrast, probing the *officials'* view of 'seriousness' usually involves the use of data sources, such as court records (which, in turn, indicates how officials *act* in ranking 'seriousness'). We say this is 'usually' the case, for officials could also be surveyed and asked what they think about 'seriousness', but this rarely happens, for the interest in officialdom is in how they act.

There is an additional dichotomy. The term "crime seriousness" can refer to a specific crime event, or the seriousness of an offence type. The former will take into account the details of each individual crime, and produce a different seriousness measure for every offence of the same type; the latter will produce a common seriousness measure for all crimes belonging to the same offence type. We have taken the view that our task is to produce methodology for determining the seriousness of an event type. This decision is in part pragmatic (as there are no details on victims, degree of aggression etc on the Police National Computer), but also relates to the future use of the measure.

2.3 Previous studies on 'seriousness' of offending

Assessing the public view of 'seriousness'

The public view of seriousness of offences has had a reasonably long history in criminology. The technique is essentially for a sample of individuals to be interviewed or given questionnaire and typically asked to rank or score a set of real or imaginary crimes.

Perhaps the most sustained attempt was in the 1960s by the American criminologists, Sellin and Wolfgang, and published in their book, *The Measurement of Delinquency* (Sellin and Wolfgang, 1964). This involved the construction of a weighted index, based on the notional gravity of each recorded offence, and derived from interviews with random samples of the population.

Similarly, the US National Survey of Crime Seriousness (Wolfgang et al, 1985) asked over 50,000 respondents to compare a set of 204 crime items to a standard item of stealing a bicycle. This provided a national scoring system for offence seriousness which is heavily used in the US.

However, we dismiss the public approach to crime seriousness, partly for theoretical and partly for pragmatic reasons. Among the theoretical reasons are that:

1. The public view of crime is thought to be more volatile and more influenced by current media concerns than that of the courts.

2. Different public constituencies are likely to have different views on seriousness rankings. The assumption that one can identify a general consensus may be a false one. Further, it assumes that the public is well intentioned and law abiding, but around one-third of males and approaching one in ten females have a criminal record. These may come to different conclusions.
3. It seems doubtful that the public is well-informed about all offences. Would they know the difference, for instance, between 'actual bodily harm' and 'grievous bodily harm'?
4. Surveys focus on words rather than deeds or on attitudes rather than behaviour.

Among the pragmatic reasons are that:

1. The requirements of the work were to produce a score within a short period of time. Surveys are time-consuming.
2. A public survey of crime seriousness would be expensive and need careful planning.

2.4 Assessing the official view of 'seriousness'

In attempting to measure the *official* view of crime seriousness, a number of approaches have been suggested. These can be divided into those which determine opinion from officials, and those which examine decisions of the criminal justice system relating to seriousness.

   (a) The expert panel. This involves obtaining a consensus view from experts in the criminal justice system as to which are the most serious offences, and providing a numerical score for each offence. This again, however, is a massive undertaking and it is unclear whether a consensus view could ever be produced. For example, some US penal codes classify crimes into 10 levels of seriousness, with such classification having been carried out by legislators. For example, the Arkansas Sentencing Commission have determined an offence seriousness ranking based on their own judgement .[CHECKING THIS]
   (b) Examination of maximum penalty in legislation. The focus here is on the maximum sentence that can be awarded for an offence within current legislation. The main difficulty is that the maximum sentence is typically an extreme case and is thus rarely awarded. Maximum sentences neither reflect court practice nor public perception of seriousness (Fox and Freiberg, 1990). For example, in the UK, arson has a maximum sentence of life, but this is reserved for the most extreme case. Most convictions for arson in England and Wales receive a non-custodial sentence (80.8% in 2001). For those that receive a custodial sentence, the average sentence is 880 days – just over two years.

   There is evidence of using the maximum sentence as a measure. For example, the University of Western Australia in 1997 attempted to rank

offences by using a composite measure of public opinion and maximum sentence (Ferrente, Loh and Fernandez, 1998). This is now being used throughout Australia (Andersson, 2003).

Of course, it seems likely that maximum sentences will be associated with views of seriousness, but the feature of 'maximum' produces a constraint. Much legislation is ancient and 'maximum' may reflect the preoccupations of an earlier age, while the range of proscribed behaviour within an offence will also be relevant. So, for example, 'indecent assault on a female' ranges from inappropriate touching to behaviour tantamount to rape and the 'maximum' may reflect the latter but not the former.

In Canada, Douglas et. al. (1997) surveyed participants on their perception of offence seriousness for a range of offences. Participants were also asked about their estimations of maximum sentences for these perceptions. These perceptions were compared to actual maximum sentences. On the whole estimates of maximum sentences (and therefore perceptions of seriousness) were lower for most offences.

Rather like surveys which tend to probe what people say rather than what they do, 'law in books' may be somewhat removed from 'law in action'. Hence, we have taken the view that the seriousness of offences should be determined by the actual sentence awarded in court rather than through the maximum sentence available. This allows for social change in crime seriousness to occur that may not be reflected in changes in legislation. Thus, absconding from lawful custody has a maximum sentence of life, but this is rarely now awarded.

(c) Use of court records to determine crime seriousness. This approach takes the actual sentence handed down by the courts as a determination of crime seriousness. This provides the official or state view of the seriousness at a particular moment in time. However, the main difficulty with this approach is that sentences are given on a wide variety of scales and are therefore not directly comparable. It is impossible to compare a sentence, say, of 120 hours of community service with 7 days in prison, without the notion of an underlying sentence severity scale. Furthermore, there are 'contaminating' factors underpinning the award of a sentence. So, for example, a very young or very old age may be a factor associated with greater leniency, while the possession of previous convictions may have the effect of increasing the sentence award. Lovegrove (2001) addresses this problem and proposes the establishment of an exchange rate. This is an issue we address in section 3.

In this study, we have chosen to use court records. We describe the use of these records in detail in Section 3. However, we can briefly highlight the theoretical and pragmatic reasons that encouraged us to proceed down this route.

Among the theoretical reasons are that:

1. We can determine seriousness from what is actually taking place in the courts and the type of offences which are coming before the courts, rather than some

idealised view of the nature of a particular offence. For example, a typical view of an arson offence would be a burning building, but many arson prosecutions relate to less serious fires.

2. This approach allows us to determine seriousness of crimes being committed now, and can be updated routinely to allow for changing official perception on the changing seriousness of offences.

Among the pragmatic reasons are that:

1. The data is readily available through the Police National Computer.
2. Once the methodology has been developed, updates to the scale can be produced at relatively low cost.

Of course, there are some limitations and weaknesses of this approach. Andersson (2003) identifies three reasons – that sentences handed down do not recognise emotional harm to the victim, that mitigating factors are taken into account when sentencing even though the harm to the victim may be the same, and that sentencing is subject to the intuition and experience of sentencers. Nevertheless, this is the approach that we wish to examine in this study and Section 3 will focus on the technical issues in developing a 'seriousness' scale.

2.5 'Frequency' – clarifying the concept

In contrast to 'seriousness', 'frequency' is much less contentious. In short, 'frequency' is a quantitative concept, reflecting the number of occurrences, while 'seriousness' is a qualitative concept which needs to be identified. The contention, if there is such about frequency, is in terms of *what to count* and *for how long* rather than *how to count.*

There are two prime candidates that are appropriate for counting, namely, offence convictions and court appearance dates. The first will count all offences which are separately charged, whereas the second would count the number of separate court appearances. Associated with this dichotomy is the need to determine which offences to include, whether cautions, warnings and reprimands are to be included, and whether offences need to be proved – to have a guilty court verdict or an admission of guilt.

In terms of how long one counts, there are issues to address. Normally, a follow-up is of the order of two years, but even this simple prescription masks some problems. In general, if we are counting offences, we would use offence date to represent the start of reoffending, whereas in counting convictions, we might use the court appearance date or date of sentence. Issues will need to be resolved on which route it is best to follow. This is discussed in Section 4.

2.6 The Police National Computer dataset
This research takes as its starting point the fact that the dataset used to determine measures of frequency and severity will be sets of records extracted from the Police

National Computer (PNC). It is therefore worthwhile looking at the main sources of reconviction data which are available, and their relative advantages and disadvantages.

Historically, the Offenders Index (OI) has provided the primary source of reconviction data to researchers and evaluators. The Offenders Index is a court based system, which brings together court records into a set of criminal histories. Criminal history information is available from 1963 in England and Wales but not Scotland.   It provides details of all standard list offences (that is indictable offences, triable either way offences, and the more serious summary offences), including date of conviction, offence codes and subsequent disposals. No information on dates of offence or on cautions, warnings and reprimands is provided.

PNC data confronts many of the disadvantages of the OI. Cautions and warnings are recorded, the database covers Scottish offending as well as England and Wales, and a fuller range of offences are covered in the dataset. In addition, criminal histories are drawn from operational records and will be more consistent than those from the OI, in the sense that records are formed through fingerprint matching rather than a computerised record linkage system. Francis and Crosland (2001) discuss the relative reliability of PNC and OI data, and found cases where an OI offender record appears to contain information from more than one individual. However, the major advantage for this research is that dates of offence are provided. As reoffending occurs before reconviction, it is a purer measure, and delays in bringing the case to court are removed. In addition, the problem of pseudo-reconvictions is eliminated if offending is used as the outcome.

The disadvantages of using the PNC should also be noted.   We focus on three disadvantages here.

    a) PNC offence codes and disposal codes differ from the standard Home Office codes, and need to be translated. This translation system is imperfect, and in our dataset, 7.6% of offences sanctioned in January 2001 had no equivalent Home Office offence code. However only a small percentage of PNC disposals (10 cases in all) had no equivalent Home Office disposal code.

    b) Another relevant issue is that of record weeding. Current ACPO policy (Criminal Records Bureau, 2003) states that if a person has not been convicted of a recordable offence for more than 10 years, and the record is "less serious" in certain defined respects, then that person's record is deleted. Thus complete criminal histories may not be obtainable as earlier records for an offender may have been lost. Similarly, cautions and warnings are weeded relatively quickly.

    c) For this study, it was not possible to distinguish between consecutive and concurrent custodial sentences using PNC information contained in the disposal qualifiers. However, samples of PNC data now contain this information, in addition to standard information on the length and type of sentence.

It is our view that PNC data provides a suitable data source for the current study as it is concerned with recent criminal history. Other studies which may be concerned

with past criminal history might be better directed towards using the Offenders Index as no weeding takes place.

2.7 Summary

What this section has attempted to do is to confront the definitional and conceptual issues that 'seriousness', 'frequency' and other relevant terms present. It has considered the different standpoints in examining 'seriousness', distinguishing between *private*, *public* and *official* points of view. It has explained why the *official* standpoint is the most appropriate for this study. We point to the use of court records to determine crime seriousness and Section 3 will discuss the data sources and methodologies for constructing an offence seriousness scale and will identify the most appropriate approach in the present context.

'Frequency' as a concept presents fewer problems than 'seriousness' and the focus has been much more of *what* to measure rather than on *how.* Nevertheless, there are technical issues to grapple with in developing a frequency scale and these are considered in Section 4.

3 The Seriousness and Severity study.

The aim of this section is to discuss the methodologies for constructing an offence seriousness scale and to identify the most appropriate approach. First, however, we focus on the data source that is used to develop an offence seriousness scale that covers all offences.

3.1 The dataset and sample

The original dataset of criminal histories was provided by the Home Office on 22 October 2004 and supplied from the Police National Computer (PNC). It consisted of the full criminal histories of all those receiving a sanction (caution, warning, reprimand or conviction) in January 2001 in the UK followed up to around mid-July 2004 for most forces and to mid-October 2004 for some. The data source included sanctioned offences that were dealt with by all police forces in the UK and from some other forces such as the forces within the armed forces, but to effect comparability with most other studies we excluded from the analysis sanctioned offences that were dealt with by the latter forces, Scotland and Northern Ireland.

The choice of a sample date of January 2001 provided us with the opportunity of a two-year follow-up and to allow offences committed during the two-year period to reach court. Offences continue to come on to the statute book and, more rarely, some offences are removed. Hence, in this sense a data source quickly becomes out-of-date. However, there are periods when there are greater changes than others. The last few years have not been notably volatile in terms of offences being added to the offence code, but this is less true with respect to sentencing. New sentences, such as drug treatment and testing orders, have been added. Furthermore, there are significant changes to the sentencing framework to be implemented as a result of The Criminal Justice Act 2003. For example, there are changes relating to the new community and breach provisions, the introduction of custody minus, intermittent custody and custody plus schemes. Certainly, any analysis of offences and sentences will provide a moving target, but the present study aims to point to a strategy that can be applied to any set of offences or sentences. Indeed, a requirement for the scale-in-use will be an update and check every three years or so. Not only do new offences and sentences become added to the repertoire (and sometimes old ones are removed), but the behaviour of the courts towards existing offences and sentences changes over time.

The original dataset contained the complete criminal history of 76,699 offenders who were cautioned, warned, reprimanded or convicted in January 2001 – these offenders had committed 1,478,834 sanctioned offences by the last follow-up date of the end of September, 2004. 137,117 of these offences were sanctioned in January 2001. As stated above, we excluded sanctioned offences that were dealt with by non-Home Office forces, Channel Islands Police, British Transport Police, and forces in Scotland and Northern Ireland from the analysis, which reduced the dataset to

126,790 offences. For the seriousness and severity study, we examined the disposals of all offences that were sanctioned in January 2001.

As already discussed, the conversion process to Home Office offence codes appears to have produced some problems, with some codes not converting at all and with others converting to codes not listed in the Offenders Index Codebook. We removed the first of these (8,687 offences) but not the second. The 8,687 missing offence codes (7.6% of all offences) represent offences with valid PNC codes that have not yet been 'translated'. The conversion routine is still under development and it is expected that many of these will become converted with the development of new conversion routines by the Home Office.

There were other minor problems which we noted. Two of the convictions for murder appear to have incorrect data relating to disposals – one was listed as being sentenced to an absolute discharge, and the other had no information relating to the duration of the prison sentence. These were also removed.

Finally, we noticed that the ages for 153 offenders were calculated as being over 100. This was because the date of birth was recorded as 01/01/1900. We confirmed that these were mostly companies and organisations as opposed to individuals. These were also removed from this stage of the analysis, leaving a total of 117, 954 offences, which were convicted or otherwise sanctioned.

In focusing on the disposals of all offences that were sanctioned in January 2001, we can consider that the sanctions consisted of four broad case types with the major distinction between those that resulted in court appearances (81.7%), and the remainder that did not - cautions (10.7%), reprimands (5.0%) and warnings (2.7%). These offences were sanctioned on 70,326 separate occasions and were for offences committed by 68,359 offenders.

Many of the offenders in the sample were convicted for more than one offence on any one conviction occasion. In addition, a number of offenders were convicted for more than one offence of the same type at the same court appearance. For example, at one court hearing one offender was convicted eight times for stealing.

For these offenders, we can choose to analyse only the principal offence at a court appearance, or to include all charged and convicted offences. We have chosen the latter route as this route more accurately represents the richness of the data. All of this data was included in the subsequent analysis.

We chose to produce scores for the *detailed* Home Office offence codes (that is, the offence code and the sub offence code). This is because there was substantial variability – both potential and actual - in offence seriousness scores within many major codes. For example, code 56 is the major code for 'Arson: criminal damage'. The two sub-codes within this code are 56.01 'Arson endangering life', and 56.02 'Arson not endangering life'. The average length of custodial sentence passed for all offenders sentenced for the former offence is 503 days (1.4 years). In contrast, the average length for the latter offence is 54 days.

3.2 Methodology for assessing crime seriousness

We considered two approaches to the measurement of crime seriousness:

a) A simple measure based on average length of custodial sentences.
b) A scaling measure based on correspondence analysis techniques.

For each method, we illustrate the result by considering the scores of three sets of ten illustrative offences. We wanted to illustrate the procedure by using a limited number of offences, for otherwise the danger is in being overwhelmed by the multitude of offences that comprise the criminal law. Perhaps more importantly, however, focusing on selected offences provide ready access to a form of face validity. One can assess how the procedures relate to the expected results. If the results from the illustrative list of offences do not conform to the expected results, this does not mean that the procedures are 'wrong', but certainly there is a warning for further investigation.

The three sets comprise of:

A. *The set of ten offences originally chosen for the pilot work and some other examples.* These particular offences – rape of a female under 16; aggravated burglary; GBH; supplying heroin; arson endangering life; obtaining property by deception; unauthorised taking of a motor vehicle; shoplifting; possession of cannabis; kerb-crawling - were chosen because they are relatively well understood and they cover the range of different types of offence. Some further examples - we compare 'arson endangering life' and 'arson not endangering life' and, secondly, blackmail and robbery - are considered. The aim of this section is to familiarise the reader with the issues before a more systematic appraisal is made in the next two sections.

B. *The set of ten most prolific offences.* These are (with the number of occurrences in brackets) – shoplifting (16,081); drink/drugs driving (6929); uninsured motor vehicle (6817); abscond bail etc. (6642); possession of cannabis (5565); common assault and battery (4813); malicious damage (4628); drunk and disorderly (public place) (4065); drive whilst disqualified (3995); stealing not classified elsewhere (3633).

C. *A set of offences with the offence with the highest number within each category for each method.* For the simple method based on average length of custodial sentences, the offences are Common Law Murder, Rape female <16, Supplying heroin, Other burglary in dwelling, Dangerous driving, Drive whilst disqualified etc, Unauthorised taking of motor vehicle, Shoplifting, Possession of cannabis, Possession of unspecified controlled drug, Uninsured motor vehicle. For the scaling measure based on correspondence analysis techniques, the offences are Murder, Attempted murder, Rape of a female <16, Importation of a Class A drug, Robbery, Other burglary in dwelling, Shoplifting, Drink/drugs driving etc., Uninsured motor vehicle, selling food not complying with food safety, and 'driving etc not in accordance with licence.'

3.3 Method 1 - Average length of custodial sentence

This analysis was considered first of all as a simple method of producing seriousness scores. It has proved popular in some countries; for example in New Zealand, Spier, Luketina, & Kettles (1991) used this methodology for developing a seriousness of offence scale. We calculated the average custodial sentence (in days) given for each type of offence that received a conviction in January 2001, treating all those who did not get a custodial sentence as having a sentence length of zero. We made the following assumptions:

- Imprisonment included all Young Offenders Institution periods of custody as well as adult custodial sentences. Detention and training orders were included.
- Those given life imprisonment were treated as having a nominal custodial sentence of 25 years. This was a pragmatic decision. Choosing a smaller value will mean that a life sentence might have a shorter disposal than other fixed term prison sentences for rape and other offences.
- No information was available on the database as to whether a custodial conviction was to be served consecutively or concurrently. Thus this information could not be included in the analysis.
- Some offenders receive multiple disposals for the same offence, but in our dataset all secondary disposals were not custodial. Thus, second, third, and fourth disposals were ignored.

In Appendix A we give the average sentence length for each offence. However, we additionally decided to investigate two "presentational scores". These were constructed as follows:

Score A: This is a rescaling of the average custodial length, with Murder scoring 20,000 and the group of least serious offences scoring 1.[1]

Score B. This is a log form of Score A, defined by

$Score\ B = ln(Score\ A)$

and rounded to the nearest integer. This score has the effect of giving more discrimination at the low end of the seriousness scale, at the expense of less discrimination at the top end. Score B has a maximum of 10 and a minimum of zero, and can be used to grade offences into 11 categories of seriousness. We felt that, as most offences will be at the lower end of the seriousness scale, it was more appropriate to consider ways of providing a greater degree of discrimination at this end of the scale. However, this is a matter of judgment.

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[1] rescaled score= 1+ 19999*(score-smallest score)/largest score-smallest score)

3.4 Results of the simple measure based on average length of custodial sentences

Appendix A contains a full list of average lengths of custody for all those sentenced for all offences.

For the three sets of illustrative offences, we obtained the following scores:

A. *The set of ten offences originally chosen for the pilot work*

These are listed in Table 3.1 in order of seriousness with rape of a female under 16 having an average custodial sentence of 3285 days and kerb-crawling – which had no custodial sentences among the ten adjudicated for this offence in the sample period – having a zero. One can see that the number of cases on which the calculations are based range from 16,081 for shoplifting to 17 for aggravated burglary, so one is likely to have more confidence in the former result than the latter. Nevertheless, one can see that the analysis provides some answers to such dilemmas as whether one should consider grievous bodily harm as more serious than supplying heroin or, in turn, more serious than arson endangering life. However, looking at the average custodial sentence which is the source of the answer, one can also recognise that the detailed answers are unwieldy and one needs a summary score. Hence we need to compare the outcomes from calculating the two 'presentational scores'.

Table 3.1. Ten illustrative offences – average custodial sentence

HO code	Offence	No. of cases	Average custodial sentence	Score A	Score B
19.07	Rape female under 16	28	3285.0	7200.6	9
29.00	Aggravated burglary	17	1395.9	3060.3	8
5.01	GBH	112	1177.4	2581.5	8
92.31	Supplying heroin	233	1001.4	2195.7	8
56.01	Arson endangering life	55	522.6	1146.5	7
53.01	Obtaining property by deception	2762	47.5	105.0	5
130.01	Unauthorised taking of motor vehicle	1707	27.5	61.2	4
46.00	Shoplifting	16081	12.5	28.5	3
92.61	Possession of Cannabis	5565	3.1	7.8	2
165.01	Kerb-crawling	10	0.0	1.0	0

Going beyond the raw scores and rankings to a consideration of scores A and B, Appendix A shows that score A ranges from 20,000 (the fixed point for common law

murder) to 1.00 for 'wilful/unnecessary obstruction (Highways Act)', while score B ranges from 10 for common law murder to 0 for the highway offence. However, the most crucial aspect is the different weightings given by the two scores to the various offences situated between these two endpoints. Table 3.1 provides some illustrations and shows that, for example, rape of a female aged under 16 is '7200.6' for score A and '9' for score B, while kerb-crawling – deemed the least serious of the offences in Table 3.1 – has '1.0' for score A and '0' for score B. One can certainly identify some notion of criminal distance between the two offences, but the scales for the two scores are very different.

The difference between the two scales is particularly noticeable in Table 3.1 in considering the offences of aggravated burglary, grievous bodily harm and supplying heroin where score A differentiates between the three offences with a score of 3060.3 for aggravated burglary, a score of 2581.5 for grievous bodily harm and 2195.7 for supplying heroin. In contrast, the calculation of score B produces a score of '8' for each of these three offences.

So how does one assess the usefulness of the two sets of scores? The important point is that the two scores are on different scales. Nevertheless, score A appears to offer detailed precision. In contrast, score B appears to be rather parsimonious. The concern is whether the apparent precision of score A is spurious. Similarly, the concern is whether score B has too little variation and does not discriminate in sufficient detail. In the final analysis a judgment has to be made. Meanwhile, however, we can present and probe further evidence that may eventually evince a sensible decision.

We take two examples – first, we compare 'arson endangering life' (HO offence code 56.01) and 'arson not endangering life' (HO offence code 56.02) and, secondly, blackmail (HO offence code 35) and robbery (HO offence code 34.01).

'Arson endangering life' versus 'Arson not endangering life' – quite appropriately, the former (with a mean custodial sentence length of 522.6 days) is considered much more serious than the latter (with a mean custodial sentence length of 55.1 days). Score A (standardised on 20,000 for murder) for arson endangering life presents as 1146.5, while arson *not* endangering life presents as 121.8. Taken on their face value, the figures suggest the seductive, but perhaps spurious, notion that arson endangering life should be considered as around nine times more serious than arson *not* endangering life. It is seductive because it seems to quantify the difference between the two offences. It is probably spurious because it is simply based on a belief that seriousness can be determined only by lengths of custodial sentences. However, one could also suggest that it is no more spurious than the manipulations of the criminal injuries compensation board making it clear that the compensation for the loss of one part of the body may be 'worth', say, nine times the loss of another part of the body. Nevertheless, there are dangers in attempting this sort of precision, for not only may a precise figure produce a spurious accuracy but also the numbers (if, for instance, one is calculating the rates for a range of offences over a follow-up period) begin to be difficult to manipulate. Score B, in contrast, aims to be less precise but more manageable.

Score B, based on a range from 10 to zero, shows 'arson endangering life' as '7' and 'arson *not* endangering life as '5'. Thus, 'arson endangering life' is presented towards the higher end of a range of offence seriousness, but above 'arson *not* endangering life', which is as one might expect. The numbers '7' and '5' are certainly easier to manage than the more precise scores of '1146.5' and '121.8' of score A. However, it is also important to recognise that score B cannot be interpreted in terms of relative seriousness – in score A 'arson endangering life' is considered to be nine times more serious than 'arson *not* endangering life', while for score B we cannot take such a ratio, as the score is based on a log transformation.

Blackmail and robbery. Both blackmail and robbery would be acknowledged to be serious offences, but few would wish to compare or to pontificate on their relative seriousness. However, this is the task that the present study is attempting to accomplish. The offence of robbery seems a much more 'hands-on' offence with the perpetrator facing the victim quite directly, while blackmail is a 'hands-off' offence with the perpetrator rarely facing the victim directly. How do such disparate offences compare?

Blackmail has a higher ranking than robbery in Appendix A with a mean custodial length of 1119.3 days compared with 700.2 days for robbery. Certainly the courts seem to think that, on average, offences of blackmail that come before them deserve a custodial sentence of about one and a half times the length of offences of robbery. However, one also must remember that a court appearance resulting in a conviction is part of a social process and perhaps blackmail is more difficult to prove than robbery – thus, prosecution and conviction may be rarer as the police may only persevere with the more serious cases of blackmail where, in such situations, victims may be willing to testify. In contrast, victims will more readily admit to being robbed than being blackmailed as hidden secrets are not in danger of being disclosed. In short, there are hidden selections taking place before cases appear in court and it is less likely that one is witnessing in court a cross-section of actual blackmail cases but more likely that one is witnessing a cross-section of robbery cases ranging from the very serious to the less serious (if, indeed, one can have a less serious robbery case). Hence, whatever one thinks of the respective merits of robbery and blackmail, one would *a priori* expect the more serious blackmail cases to be appearing in court, whereas there might be a greater range of robbery cases coming before the courts.

Focusing on scores A and B shows once again the differences between the two approaches. Score A has blackmail with a score of 2454.1 and robbery with a score of 1535.6. Thus, score A represents a similar difference between the two offences of the raw scores where blackmail had roughly one and a half times the score of robbery. Nevertheless, score A unequivocally places blackmail as more serious than robbery in that scoring system. Score B again has the same ordering, placing blackmail in category 8 and robbery in category 7 in that scoring system.

So how does one assess the usefulness of the two scores? As already stated, score A offers a great deal of precision, but little guidance as to what a particular value means. Score B usefully reflects the commonsensical notion that both blackmail and robbery are serious offences and, while very different in performance and perhaps their route through the criminal justice process, they can be regarded as much the

same in their seriousness. Hence, for this type of reason the use of score B rather than score A begins to be the prime candidate for developing a seriousness score that can be used for presentational purposes. Score A, in contrast, has more merit in providing a basis for further statistical manipulation and in determining the relative seriousness of two offences. However, we first need to see how the two scores shape up by exploring offences in a more systematic way.

B. *The set of ten most prolific offences.*

In considering the criminal justice process, it is usually more useful to focus mainly on the usual and the routine rather than the unusual and the strange. In other words, how does this developing procedure cope with the normal routine of cases that come through the courts? The usual and routine are easily identified by focusing on the most prolific offences that come through the courts. The set of offences displayed in Table 3.2 represents the ten most prolific offences in January 2001 – providing a total of 63,168 offences (or 54 per cent of the grand total). These ten offences certainly capture the main activity of the courts. In Table 3.2 the offences are ordered in terms of gross numbers rather than in terms of seriousness.

Table 3.2. Ten most common offences – average custodial sentence

HO code	Offence	No. of cases	Average custodial sentence	Score A	Score B
46	Shoplifting	16081	12.5	28.5	3
803.02	Drink/drugs driving	6929	6.3	14.9	3
809.01	Uninsured motor vehicle	6817	0.2	1.3	0
83.01	Abscond bail etc.	6642	6.6	15.5	3
92.61	Possession of cannabis	5565	3.1	7.8	2
105.01	Common assault and battery	4813	9.7	22.5	3
149	Malicious damage	4628	4.5	10.7	2
141.01	Drunk and disorderly (public place)	4065	0.0	1.1	0
807.01	Drive whilst disqualified	3995	55.5	111.8	5
49.1	Stealing not classified elsewhere	3633	64.4	135.8	5

In terms of seriousness, the most striking feature is that, almost without exception, the average custodial sentence for each offence is remarkably low. The exceptions are 'stealing not classified elsewhere' (64.4 days) and 'driving whilst disqualified' (55.5 days). However, apart from the two exceptions, both scores A and B are comparatively low. While one can discriminate between the offences using score A, again perhaps score B represents a more commonsensical approach with 'stealing not classified elsewhere' and 'driving whilst disqualified' gaining a score of '5' and the rest classified as between '3' and '0'.

The outcomes for the most prolific types of offences as displayed in Table 3.2 remind us of a criminological truth. There is an inverse relationship between prolific offences and the seriousness of offences. In other words, the most prolific tend to be regarded as the less serious. Offence seriousness can be conceptualised as a pyramid as Hagan (1984) has convincingly argued. Hence, we need now to find a way to focus more on offences higher up the pyramid.

C. *A set of offences with the offence with the highest number within each category*

Table 3.3 has a different starting point. It again considers the types of offences with the highest number of cases but, instead of overall as with Table 3.2, it considers the highest number within each category of score B. This perhaps needs to be explained. So, for example, there are 5 different offence types within category 9 but rape of a female under 16 years (with 28 cases) has the highest number of cases.

Table 3.3. The most common offence within each category– average custodial sentence

HO code	Offence	No. of cases	Average custodial sentence	Score A	Score B
1.01	Common Law Murder	20	9125.00	20000.00	10
19.07	Rape female <16	28	3285.0	7200.6	9
92.31	Supplying heroin	233	1001.4	2195.7	8
28.03	Other burglary in dwelling	1692	349.03	766.0	7
802	Dangerous driving	443	120.6	265.3	6
807.01	Drive whilst disqualified etc	3995	55.5	122.5	5
130.01	Unauthorised taking of motor vehicle	1707	27.5	61.2	4
46	Shoplifting	16081	12.5	28.5	3
92.61	Possession of cannabis	5565	3.1	7.8	2
92.69	Possession of unspecified controlled drug	38	0.7	2.6	1
809.01	Uninsured motor vehicle	6817	0.2	1.3	0

However, while offences with the highest number are interesting, they cannot necessarily be regarded as representative of their category. Nevertheless, they can be used to consider face validity in broad terms.

Table 3.3 demonstrates that these most common offences within each category range from serious offences against the person – eg murder and rape of a female under 16 with scores of 10 and 9 respectively – through a mixture of serious crimes against property – eg other burglary in a dwelling - and important motoring offences – eq dangerous driving, driving while disqualified - to the offences which are

generally regarded as much less serious. Among the latter there is the minor property offence of shoplifting, the contentious issue of the possession of cannabis and other unspecified drugs and, finally, a motoring offence in the lowest category.

3.5 Discussion of the simple measure based on average length of custodial sentences

The results above demonstrate that using average length of custodial sentence as a measure of seriousness gives an impressive basic ordering of offences on which we can usefully build.

However, there are concerns with this measure we wish to confront.

1. We are ignoring other disposals which may provide information on crime seriousness scores.
2. For any particular sentence length, we are treating YOI and adult custody as having the same severity, and this assumption may not be valid.
3. There is no discrimination for those who do not receive custodial sentences. In this analysis, all offences which do not receive custodial sentences receive a score of 0.
4. We do not take account of second, third or fourth disposals.

For this reason, we consider an alternative approach – that of correspondence analysis.

3.6 Method 2. Correspondence analysis

The approach of correspondence analysis is akin to a factor analysis, but it analyses a table of cell counts rather than a collection of continuous measures. The analysis produces a "principal" set of row scores (for the offences) and column scores (for the disposals). This method was used by Höfer (2000) in determining rankings of sanction severity in German crime data.

This "principal" set of scores are the scores representing the first dimension of the analysis, and this dimension will explain the greatest degree of inertia. This first dimension will therefore usually represent the underlying seriousness scores for the offences and for the disposals. While the second and third dimensions can also be examined, they will not normally be relevant for this analysis. A short explanation of correspondence analysis is provided in Appendix F [TO BE ADDED], and more details of the methodology is given in Greenacre (1980).

We construct a large two dimensional table of offences by sentence disposals, of the form displayed in Figure 3.1. We first need to determine how to categorise the offences and the disposals.
- Offence categories were determined by the detailed Home Office codes, as before. This gave 405 offence codes which were input into the analysis.
- Sentence information was summarised as follows: Each sentence was represented by one or more disposals. Most offences have only one disposal,

but there are some with more than one disposal. We adopted the following procedure:

1. *Single disposals* were categorised into one of 91 possible categories (the disposals in the dataset fell into 56 of these categories).   Each disposal consisted of a disposal type and a duration, and suitable categories were determined by combinations of disposal type and a range of durations. The correspondence analysis was thus kept to a manageable size. For example, one of the most common disposals is adult imprisonment. The possible duration for this disposal ranges from 1 day to life. If all custodial durations were to be used we would end up with 195 different disposals. Thus, Adult custody was categorised into 11 categories. More detail is provided in Appendix E1.

2. *Fines.* Earlier investigations showed that the amount of the fine appeared to be negatively associated with the severity of the disposal. This is a curious feature that needs some discussion, for it relates to the issue of apparently discriminatory practice in sentencing. Discriminatory practice in prosecution and sentencing has a long history and differential sentencing for different groups continues and can be regarded as either directly discriminatory or by design. The former relates to when particular groups, identified by, say, colour, are routinely given harsher sentences than the norm. The latter however, is less clear, for it may mask indirect discrimination. When fines are imposed according to the ability to pay, this is an attempt to match the 'meaning' of the fine; a £1000 for a millionaire may 'mean' the same as a £1 fine for a person on social security benefits. Hence, fines may have a relative rather than an absolute value. For these types of reasons, we therefore treated fines as a single group.

3. *Multiple disposals* for an offence were categorised into one of 18 possible groups, using the detailed rules in Appendix E2. The disposals in the dataset fell into 13 of these categories

In addition, some of the coded durations are suspect and may not be the true disposal amounts awarded.

Each offence code will have a certain pattern of disposals over these disposal types: Over the 405 offence codes, we produced a two way table of offences by disposals:

Figure 3.1. Form of data for correspondence analysis.

	fine	⋮	⋮	Comm. rehab 180 days	Comm. rehab 270 days	⋮			⋮	Prison 180 days	Prison 270 days …	⋮	Prison life	TOTAL
Murder	0			0	0					0	0		25	25
Manslaughter	0			0	0					0	2		5	22
…														
…														
Rape of female <16	0			0	0					2	3		1	
…														
…														
…														
…														
Bicycle theft	6			12	4						0		0	63

Correspondence analysis is available in SPSS although the statistical models which are equivalent or closely equivalent to correspondence analysis (The Goodman RC model, the Goodman correlation model etc.) are not available.

3.7. Results from the correspondence analysis - Offence seriousness

For the correspondence analysis, we extracted the offence scores for the first dimension of the analysis, and took these to represent seriousness. As the scores will have both positive and negative values, we adjusted the scores through a shift in mean so that the smallest score was given a score of zero.

As before, we decided to investigate two "presentational scores". These were constructed as follows:

> Score A: This is a rescaling of the row scores for Dimension 1, with Murder scoring 20000 and the group of least serious offences scoring 1.00.[2]
>
> Score B. This is a log form of Score A, defined by
>
> $$Score\ B\ =\ ln(Score\ A)$$
>
> and rounded to the nearest integer. This score has the effect of giving more discrimination at the low end of the seriousness scale, at the expense of less discrimination at the top end.

For the three sets of illustrative offences, Tables 3.4 - 3.6 show the seriousness scores. We discuss each in turn, and compare it to the earlier analysis.

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[2] rescaled score= 1+ 19999*(score-smallest score)/largest score-smallest score)

A. *The set of ten offences originally chosen for the pilot work.*

Table 3.4 Ten illustrative offences – correspondence analysis

HO code	Offence	CA adjusted score	Score A	Score B	Average Custodial Score B
19.07	Rape female under 16	8.534	2708.1	8	9
29.00	Aggravated burglary	4.600	1481.89	7	8
5.01	GBH	1.317	458.58	6	8
92.31	Supplying heroin	0.899	328.29	6	8
56.01	Arson endangering life	0.519	209.84	5	7
53.01	Obtaining property by deception	0.001	48.38	4	5
130.01	Unauthorised taking of motor vehicle	-0.015	43.39	4	4
46.00	Shoplifting	-0.040	35.60	4	3
92.61	Possession of Cannabis	-0.057	30.30	3	2
165.01	Kerb-crawling	-0.084	21.88	3	0

We can directly compare the results from the simple average custodial score with the correspondence analysis (CA) approach. Firstly, we can observe that the ten offences are ranked in the same order of seriousness. However the inclusion of more sentencing detail in the CA score has shifted a large number of offences away from a score of zero on score B. This is most dramatically shown in Table 3.4 with the offence of kerb-crawling, which had a score of zero in the earlier analysis (shown in the last column of the table). The score of zero in the earlier analysis is the direct outcome of no offender having a prison sentence. Including other disposals with the CA score has resulted in kerb-crawling now being nearly equivalent to possession of cannabis.

B. *The set of ten most prolific offences.*

Table 3.5: Ten most common offences – correspondence analysis

HO code	Offence	CA score	Score A	Score B	Average Custodial Score B
46.00	Shoplifting	-0.040	35.60	4	3
803.02	Drink/drugs driving	-0.073	25.31	3	3
809.01	Uninsured motor vehicle	-0.126	8.79	2	0
83.01	Abscond bail etc.	-0.083	22.20	3	3
92.61	Possession of cannabis	-0.057	30.30	3	2
105.01	Common assault and battery	-0.032	38.09	4	3
149	Malicious damage	-0.040	35.60	4	2
141.01	Drunk and disorderly (public place)	-0.073	25.31	3	0
807.01	Drive whilst disqualified	-0.129	7.86	2	5
49.1	Stealing not classified elsewhere	0.012	51.81	4	5

We can again directly compare the results from the simple average custodial score with the correspondence analysis (CA) approach. A similar development to that shown in Table 3.4 can be observed in Table 3.5 in the sense that offences in the lower ranges are getting higher scores in the summary "score B". This is most striking with the move of the offence of Drunk and Disorderly from zero in the earlier analysis to 3 in the CA analysis. The CA analysis however distinguishes between the offences of drunk and disorderly and "uninsured motor vehicle", giving these scores of 3 and 2 respectively, whereas both offences were non-custodial in the earlier analysis and had a score of zero.

Comparison of the scores for driving whilst disqualified is interesting as the change between the two scores is particularly noticeable. The score of 5 produced from the average custody analysis is largely a result of (slightly) over 50% of cases receiving custodial sentences. One possible explanation for this relatively high number of custodial sentences is that, as the name of the offence implies, these offenders have some kind of history of motoring offences and this history has influenced sentencers. However, we can see that the CA score ranks this offence as less serious than the average custody score ranks it. In fact, this illustrates how the use of the score obtained from the CA analysis is more realistic as is takes account of *all* sentences given. Although over half of the cases receive custodial sentences about 47% do not. There is a wide distribution of disposals given for driving whilst disqualified. Perhaps the most illustrative summary of this distribution is to note that one fifth of cases receive a custodial sentence of 3+ to six months, whilst one fifth receive a community punishment of less than one year

C. *A set of eleven offences with the offence with the highest number within each category*

Table 3.6. The most common offence within each category– correspondence analysis

HO code	Offence	CA adjusted score	Score A	Score B
1.01	Murder	64.010	20000.0	10
2.00	Attempted murder	17.048	5361.93	9
19.07	Rape female <16	8.534	2708.12	8
92.03	Import Class A	2.643	871.89	7
34.01	Robbery	0.779	290.88	6
28.03	Other burglary in dwelling	0.301	141.89	5
46	Shoplifting	-0.040	35.60	4
803.02	Drink/drugs driving etc.	-0.073	25.31	3
809.01	Uninsured motor vehicle	-0.126	8.79	2
89.05	Selling food not complying with food safety	-0.145	2.87	1
807.02	Drive etc not in accordance with licence.	-0.151	1.0	0

Table 3.6 is not directly comparable with Table 3.3 for the earlier analysis. However, it is important to note that the broad pattern of the relative seriousness of the different types of crime which was identified earlier appears to be even stronger for the correspondence analysis. The most serious offences tend to be crimes against the person or drug importation offences. These are followed by crimes against property (burglary, shoplifting) and then with the less serious motoring and food safety offences.

3.8 Discussion of the seriousness measure based on the correspondence analysis

The development of the serious measure based on the correspondence analysis has made a significant advance over the simple measure. Being based on all disposals, it has enabled a much greater discrimination at the lower end of offence seriousness. In effect, it has moved the baseline on score B from 0 to 2, and thus relatively few offences are now identified in the lowest category of seriousness.

These offences at the lower end of seriousness highlight an important development in the CA analysis. It enables more offences to be 'brought into play' than the earlier analysis. This can be shown by the two histograms in Figure 3.2, where the high proportion of zeros in Method 1 on Score B means that in effect they are excluded from consideration. In contrast, the richer detail considered by the correspondence analysis means that nearly all offences are allocated a positive value of Score B.

Figure 3.2 Histograms showing the distribution of the values of score B for the detailed offence codes.

Average custodial length score — **correspondence analysis score**
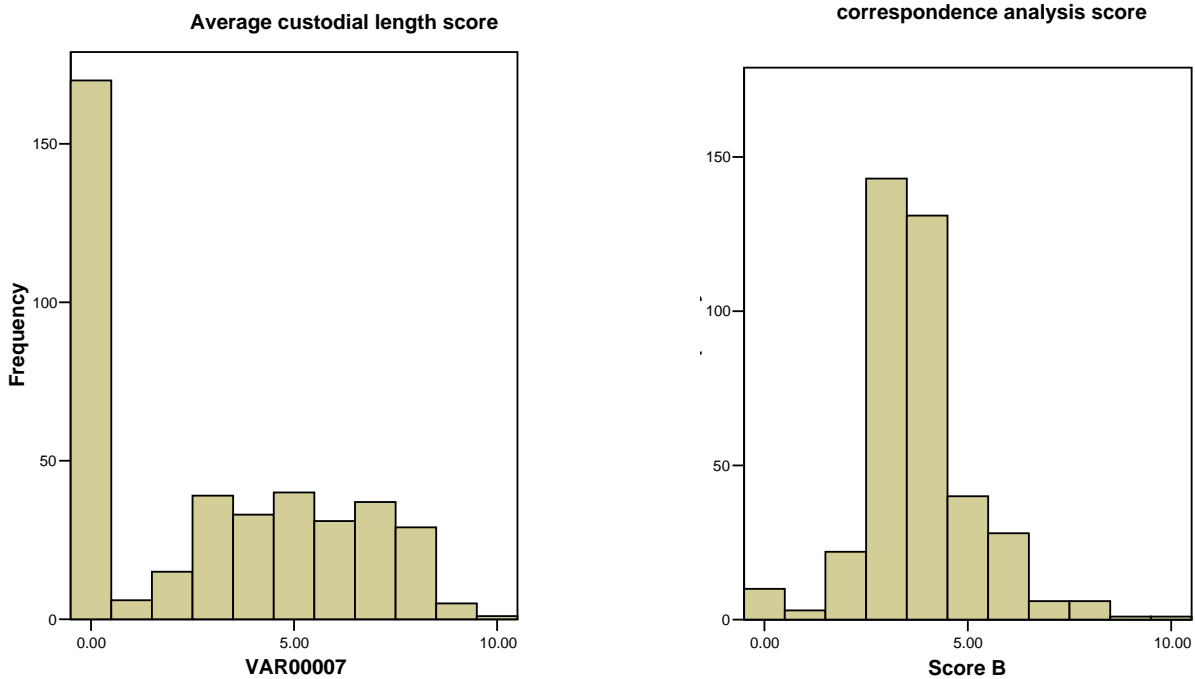
Figure 3.2 demonstrates that, while 3 and 4 are the most popular values for Score B for the CA approach, most offences are categorised into category 0 for the average custodial sentence length approach.

Overall, the ranking of offences by the correspondence analysis in terms of seriousness appears to be acceptable.

3.9 Results from the correspondence analysis - Sentence severity

The correspondence analysis not only gives scores for the offences, but scores for the sentences or disposals are also produced. Appendix C gives the scores for the sentence disposals as produced by the correspondence analysis [3]. The scores are not ranked for this analysis, but are grouped into particular disposal types.

We transformed the disposal scores following the same transformation used on other scores.

Score A: This is a rescaling of the Correspondence Analysis dimension 1 scores, with life imprisonment scoring 20000 and the least serious disposal of "otherwise dealt with" scoring one.

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[3] It is important to note here that (as with the offences) scores can only be produced for those disposals that were evident in the dataset used for this analysis. In other words there are some disposals available to the courts for which no score is calculated as these disposals were not used in January 2001.

Again, the order of the sentence disposal scores seems logical, but some discussion is needed in order to clarify a few points.

Firstly, the severity scores indicate that youth custody is a more serious disposal than the equivalent time given for adult custody. For example, one tariff for youth custody included in the analysis is 2-3 years[4]. This is scored as more serious than 3-4 years of adult custody.

Secondly, there are some anomalies in the ordering. For example,1-2 years in a young offenders institution is scored slightly less than 9-12 months in that institution. However, on closer inspection it is clear that any difference in scores for these two disposals is very small. Similarly, tagging plus a community punishment of one year or more is scored slightly less than tagging and community punishment of less than one year, but again the difference in scores is very small. Such small variations are to be expected to some degree as the scores produced are estimates of the underlying true scores, and Correspondence Analysis does not constrain these scores to be ordered in any way.

3.10 Discussion on the correspondence analysis approach

These results appear to offer a sensible way forward, by taking into account a wide range of disposal information. The distribution of scores produced by the CA methodology seems to be intuitively more correct.

3.11 Other approaches

The paired comparison approach

This uses data at the individual level, by examining pairs of individual sentences for different offences given to the same individual tried before the same court at the same time, and to analyse by using paired comparison methodology. This approach is a complex statistical exercise and initial work on this area was carried out by Francis et al (2001) using a sample of 7400 sex offenders. This method has the considerable advantage of controlling for court, individual and judge effects by design and will be able to produce rankings of offence seriousness as well as sentence severity. The disadvantage is that it is wasteful of data. Additionally, it may introduce bias as those being sentenced for more than one offence are not a random subset of all offenders. We have not explored this work further in this project as the timescale of the project is limited, but have reported briefly on some initial results to provide a comparative measure. Appendix D contains details of the ranking of the most serious 10 offences using historical Offenders Index cohort data (Prime et al, 2001).

Other bilinear modelling techniques

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[4] There were higher tariffs for youth custody imposed in January 2001 but numbers were small

Other bilinear modelling approaches are close in nature to correspondence analysis, and have the advantage of belonging to a well-known family of statistical models. Both the Goodman RC model and the Goodman correlation model can be used as an alternative to the correspondence analysis model. However such models are not available in the standard statistical packages such as SPSS. Firth (2001) provides software on his website for fitting such models and Lambert (2003) provides a description of the use of LEM. Both software packages are free.

3.12 Controlling for other factors affecting sentence length

We now need to address the issue that the concepts of crime seriousness and sentence severity are not the same. This can be seen by examining two crimes – criminal damage and forgery. Forgery tends to be committed by older males, who already have a criminal record and who have perhaps moved into forgery as a less active criminal occupation. Criminal damage is committed by the young – mostly young males. The sentence for forgery offences will be partly determined by the age of the offender and previous criminal history, and average sentences will thus be higher than they would be if committed by a younger male with no criminal history. In contrast, average sentences for criminal damage will be lower, but might be expected to be higher if committed by an older offender with a complex previous history. Sentences will also be determined by other variables – perhaps by the gender and ethnicity of the offender, and certainly by the plea, the degree of co-operation and the physical attractiveness of the offender, and the judge's mood and stress, as well as the court location and court history of sentencing that offence.

We can distinguish between *raw* offence seriousness uncontrolled for the above factors and an *adjusted* offence seriousness, which would attempt to control for many of the above factors. Potential variables available in the PNC as controlling variables are:

> Age at conviction
> Number of previous convictions
> Gender
> Plea

We have considered two approaches to the problem of control:

a) **A statistical modelling approach**. For the average custodial length measure, this is relatively straightforward. A statistical model would be fitted at the individual level, either modelling custodial length as a function of the four controlling variables and detailed offence group, or modelling the probability of custody, and the length of custody given a custodial sentence. For the correspondence analysis approach, the modelling route is more complex. The most promising approach is to start with the Goodman RC association model and to include covariates into the statistical model for the row scores. Due to pressure of time, we have not explored this further.

b) **A subgroup analysis.** This approach, recommended by the steering committee, has been the one that we have investigated more closely at this stage. Essentially one is trying to control for various variables by analysing particular subgroups. There are various ways forward. We focus on two possibilities here – what we call the 'pure' and the 'pragmatic'. However, owing to the question of numbers, we consider males rather than females in this discussion.

In controlling for certain variables, one is further constrained by what is available. While one might have some impressive theory that physical appearance is influential in sentencing decisions, it will remain just an untested theory unless appropriate data is available. In the present study we have reliable information on at least four variables – sex (and we have indicated that we are focusing on males), age, number of previous convictions and plea. We consider the latter three variables in determining a subgroup analysis.

In essence, the *'pure'* approach focuses on sentencing decisions that are uncontaminated by other considerations. So, for example, there may be leniency for younger offenders and so, for a 'purer' sentence, it may be more appropriate to focus on adult offenders. Similarly, with the issue of previous convictions, those with *no* previous convictions uncontaminated by the need to take previous convictions into account will have a 'purer' sentence than those who have previous convictions. Further, those who plead guilty clearly acknowledge their guilt and so again those sentenced after a guilty plea avoid all the contingencies of a trial. Hence, we argue that the 'pure' sentence – based on variables that are available in the analysis – will be adults pleading guilty to the offence with no previous convictions. In the event, however, while this approach may be theoretically sound, the numbers are insufficient to pursue the analyses simply based on males pleading guilty with no previous convictions. Of course, one could claim this problem could be overcome by taking a longer timeframe, that is, longer than a month, but the problem is more structural. In brief, adult first offenders do not display the wide repertoire of offending that one needs in order to construct scores for all offences.

An alternative is a more 'pragmatic' approach. Given that the main problem is about numbers, then it would seem reasonable to focus on the sub-group with the largest numbers. In fact, based on guilty/not guilty and adult/minor dichotomies together with previous convictions divided by nil, 1-2 or 3 or more, the sub-group with the largest numbers is that of adult males pleading guilty with 3 or more previous convictions. While this is an improvement in providing data over a broader repertoire, the present analysis was still limited in terms of numbers.

There is in any case a further justification for restricting analysis to adults. The placement and seriousness scores of some of the offences may be distorted by the inclusion of juvenile offences. For example, unlawful sexual intercourse with a girl under 13 would normally be considered to be a serious offence. However, in our analysis it is given a score B of zero for the average custodial sentence measure and a score B of 4 for the correspondence analysis. The mental picture of this offence is of an far older adult exploiting a young girl, but in fact in our dataset there were two offenders – one with two offences was aged 13 and the other was aged 16. Neither of these offenders received a custodial sentence. In this example, we are left with a

choice of either accepting the score for this offence based on two juveniles, or basing the analysis on an adult dataset and getting no estimate at all. Taking a larger sample is probably the only way of proceeding here.

Table 3.7 below gives the number of offences for each of the two scenarios above. We carried out a correspondence analysis on each of these groups, and Table 3.7 presents correlations between the score A measures for these two subgroups and for the full data.

Table 3.7 Spearman rank correlations between the score A results for the pure and pragmatic subgroups and the total sample.

	Pure subgroup *Males* *Guilty plea* *0 prior convictions* *18 and over*	Pragmatic subgroup *Males* *Guilty plea* *3 or more prior convictions* *18 and over*	Total sample
Pure subgroup		0.842	0.917
Pragmatic subgroup	0.842		0.945
Total sample	0.917	0.945	
N	11016	41727	117954
Number of scored offences	316	287	406

We see first of all that the sample sizes for the two subgroups have reduced substantially. The pure subgroup is about one tenth of the size of the total sample; the pragmatic subgroup does better, having about one third of the number of offences of the full sample. Both subgroup analyses score fewer offences as they are not present in the subgroup. The pure subgroup, surprisingly, does better than the pragmatic subgroup, with 316 offences scored – however this still leaves over 20% of offences present in the full sample unscored.

Spearman rank correlation scores were calculated between the three scores for those offences with scores. The correlations were all very high (above 0.9 for correlations with the score based on the full sample) and highly significant.

Rank correlations are presented as the standard Pearson correlation coefficient would be highly influenced by the small number of large seriousness score values. The Spearman correlations are instead looking at the correlations in the rank ordering of the scores. These high correlations are suggesting that the scores are highly related and so perhaps the need to control for the main factors influencing sentencing is less than we thought.

However, if we do want to control, it is clear that taking one month of offences is no longer sufficient. A longer timeframe would make the analysis of either subgroup possible, and we suggest at least a three month period for the pragmatic subgroup and one year for the pure subgroup.

3.13 Seriousness scores for missing offences.

Another issue in using crime severity scores is how to score offences for which no information appears in the database. For example, some offences are very rare – and will occur only once or twice a year. Other offences might be new onto the statute book. One possibility is for these to be scored according to the closest offence in nature, but this would need judgement in order to carry out such an exercise.

An alternative is simply to omit cases which have offences with no score. This is a satisfactory approach as long as the number of omitted cases is small. A third approach, which we recommend, is to take a weighted average of the seriousness score for each main offence code, and to use that average as the score for all unclassified offences. Thus, if a new motoring offence 802.34 was coded, we would produce a weighted average of all existing 802 codes to produce a seriousness score for the 802 offence group.

3.14 Summary

Of the two measures proposed in this section we recommend the use of the Correspondence Analysis technique over the average length of custody measure. The reason for this is twofold. The first is pragmatic – it produces a score which does not have a large number of zeroes, but which still produces a good spread of values over the range specified. The second is political. It uses all of the disposal information than just the information on custody. It is important to have a methodology that recognises the large range of different disposals now available to courts, and the methodology which analyses such disposal information needs to include such individuals rather than assume that their sentence is zero.

We also discussed the need for control. While our analysis has suggested that perhaps producing a controlled analysis will not give results which are substantially different, we have suggested that a subgroup analysis could be undertaken. This however will need at least three months of offence data rather than the one month of data used in this study.

4. Frequency of offending and offence seriousness over a follow-up period.

4.1 Frequency of offending

We now turn our attention to the concept of frequency of offending. The concept is simple – the number of offences committed by an offender after a target conviction within a fixed period of time, but the complications arise in the detailed specification.

We deal with the points one by one.

a) **What do we count?** There are two basic choices – we can count *offences* or we can count *court appearances*.
   If we count offences, then as we are using an official database, we are limited to an examination of offences known to the police. We therefore have a choice as to whether we count *proven* and *unproven offences* (where no admission of guilt has been made or no court outcome has been obtained) or just *proven offences* (either though a court case or through a caution, reprimand or warning, where guilt is assumed). Within the category of proven offences, we may also choose to limit our attention to those proven in a court of law, and to ignore cautions and other police disposals. We may also decide to include offences taken into consideration (TICs) although the reliability of TIC information on the Police National Computer is questionable.
   If instead we count court appearances, then we need to be careful about pseudo-reconvictions, which are offences for which the court appearances take place *after* the target date but which relate to offending which took place *before* the target date. With PNC data, this problem can be avoided by counting only court appearances which relate to offences committed within the follow-up period. We again might want to consider including cautioning dates in this definition, and include such dates as separate "criminal justice appearances".

   We limit attention in this work to four measures:

   F1) number of proven offences including cautions, warnings and reprimands.
   F2) number of proven offences excluding cautions, warnings and reprimands.
   F3) number of criminal justice appearances relating to offending in the follow-up period (court appearances and caution, warning and reprimand appearances).
   F4) Number of court appearances relating to offending in the follow-up period excluding cautions, warnings and reprimands [5].

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5 Other measures that could have been considered are the number of separate 'start dates' on which at least one proven offence resulted. This measure would lead to a count of one for each start date regardless of the number of offences. In

The utility of these measures is discussed in section 4.3 below.

b) **What timescale do we look at?** This involves two sub-issues – what date do we take as the start of the follow-up interval, and what follow-up time do we take?

1.) The *start date* will usually be the first day after the target conviction or caution. However, we need to consider those in custody. Should we start the clock from the date of conviction or the date of release? Ideally, we would want to use date of release for those in custody, but there is no such information on the Police National Computer database. We might consider instead that an estimate of date of release could be made, given the length of custodial sentence awarded. However, we then run into an additional problem, in that in our PNC dataset, no distinction is drawn between consecutive (or non-effective) sentences, and concurrent (or effective) custodial sentences (note that in current samples from the PNC, this information is now supplied). Thus such an estimate would be very crude, and there are additional difficulties as there is no information on the length of time the offender spent in remand before the court appearance. We have therefore taken the view that we will take the day after the target conviction date as the start point for reconviction studies.

2.) In a standard study, the l*ength of follow up time* will usually be taken as a fixed period – one year, two years or three years, although other times are possible. There is the possibility of taking shorter follow-up times for those with a later target date. If so, then it would be necessary to look at the *rate of offending per year,* dividing the frequency of offending by the length of the offenders follow-up interval. The follow-up interval for this study is two years.

c) **When does reoffending start?** With the PNC database, the event of interest will be the *start date of offending* for an offence. This contrasts to the usual practice of using the date of court appearance when using criminal histories sourced from the Offenders Index [6].

An alternative is to measure frequency through court (or criminal justice) appearances (as is the case when using OI data). In these instances the date of the appearance would still be taken as the reoffending date. At court, this is usually taken to be the date of sentence. Given that the PNC provides us with information on the actual date of offending, for this study we use this date as the date of reoffending.

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addition it would be possible to consider the total number of sanctions received at any criminal justice appearance as opposed to simply counting the court/criminal justice appearances.

6 It is worth mentioning here that the PNC database also contains an end date of offending for an offence. But this is rarely filled in, and is sometimes equal to the start date. Where it is not, it indicates a period of continuous offending activity. Thus a typical case would be an offender charged with stealing from motor vehicles with an offending period spread over two weeks. The offender has been charged with only a single offence, but other offences would be taken into consideration by the courts.

4.2 The follow-up study – examining the measures in practice

We continue with the dataset used in Section 3. This time, we use the data to examine two-year follow-ups for all offenders who were convicted, cautioned, warned or reprimanded in January 2001. We are interested in the ease of use and of calculation of the various measures, the degree of association between them, and how they might be used in practice. For the offence-based measures, we are also interested in the extra follow-up time needed beyond the two-year follow-up period to identify whether a recorded offence is proved , NO DISCUSSION ABOUT EXTRA TIME NEEDED TO ALLOW FOR DETERMINNG WHETHER OR NOT OFFENCES ARE PROVEN.

We start with the 68,359 offenders identified in Section 3 who were sanctioned in January 2001. Our target date is the first sanction in that period. How do the measures compare?

4.3 The summary frequency measures.

We first examine the summary frequency measures. F1 and F2 are very similar, using start of offence date to determine whether or not a subsequent offence falls within the two year follow-up period and counting the number of proven offences in this period. For the second measure, offences leading to cautions, etc are ignored, and only offending proved in a court is included. The first measure includes cautions, warnings and reprimands. F3 and F4 are similar, but use criminal justice appearances. The distributions of the frequency measures F1-F4 are shown in Figure 4.1, displayed on a log-log scale for clarity.

We can see that measures F3 and F4, unsurprisingly, tail off more rapidly than F1 and F2, but both measures appear relatively smooth. Table 4.1 below gives some summary statistics of frequency for the four measures.

Table 4.1 Summary information of the four proposed measures of frequency

	F1	F2		F3	F4
Mean	3.02	2.95		1.44	1.37
Standard deviation	5.79	5.77		2.50	2.47
Maximum	128	128		86	86
Skewness	3.93	3.95		5.64	5.72
Percentage of offenders with			Percentage of offenders with		
> 5 offences	18.3%	18.0%	> 5 court appearances	6.2%	5.9%
> 10 offences	9.0%	8.8%	> 10 court appearances	0.8%	0.8%
> 20 offences	2.1%	2.1%	> 20 court appearances	0.1%	0.1%

All four measures have modes and medians of zero, and all four have high skew. Surprisingly, the maximum number of offences does not vary widely, with a maximum of 86 court appearances and 128 offences.

If we look simply at whether the offender recidivated or not in the two year period, we obtain the results in Table 4.2.

Table 4.2 Binary measures of recidivism

	Number recidivating	% of sample
Reoffending in two year period proven through court proceedings or caution, warning, reprimand (F1,F3)	32962	48.2
Reoffending in two year period proven through court proceedings only (F2, F4)	31230	45.7

Figure 4.1 Histograms of the four measures of frequency over a two-year follow-up period. The histograms are displayed on a log-log scale.

F1 Proven reoffending including cautions etc
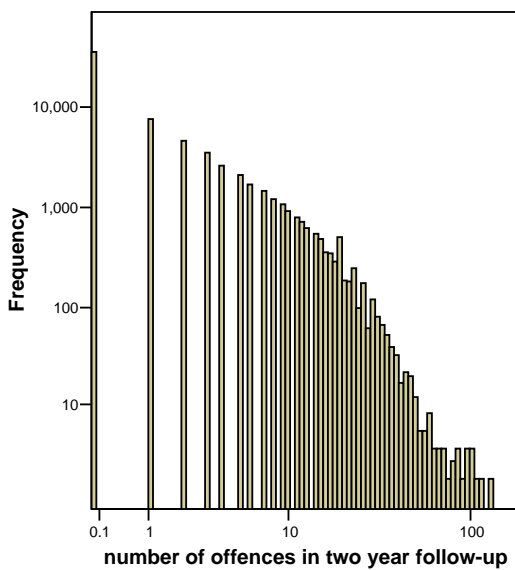
F2 Proven reoffending excluding cautions etc
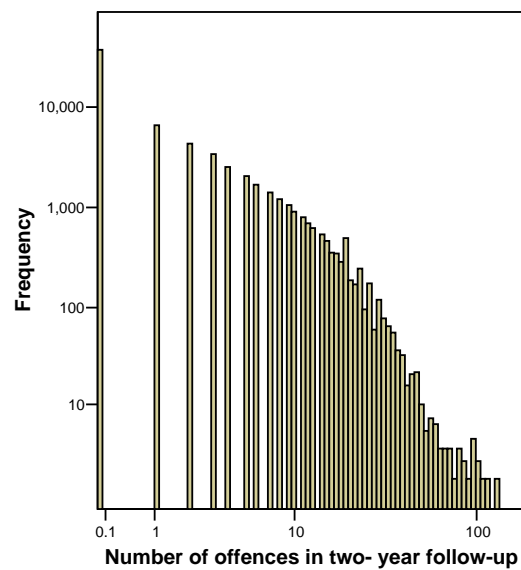
F3. Number of guilty court appearances and cautions, warnings and reprimands.
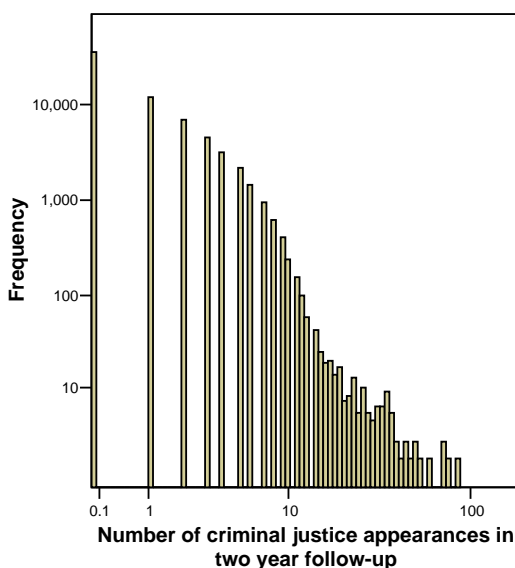
F4 Number of court appearances resulting in guilty verdict
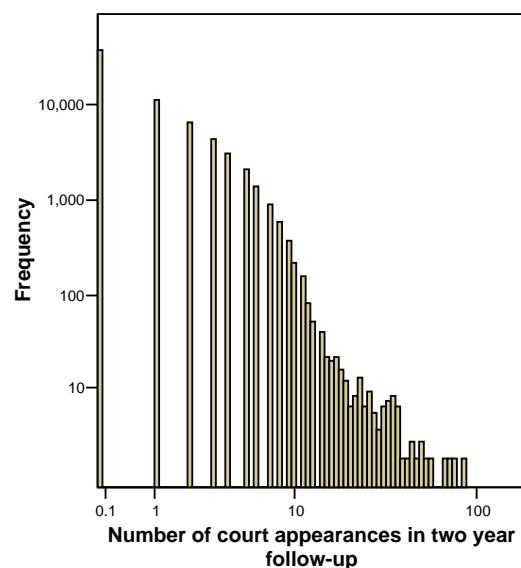
It is clear that there is little difference between the measures F1 and F2, and between F3 and F4. Table 4.3 below provides additional information that this is true. The measures F1 and F2, and F3 and F4 differ on just over 6% of cases, and where they do differ, they do so mostly by only one offence (or court appearance). The decision on whether to include offences leading to caution or not is clearly a criminological matter – we take the view that they should be included and would choose F1 and F3 over F2 and F4.

Table 4.3 Comparison of measures F1 and F2, and F3 and F4

		N	%
F1 vs F2	No difference in frequency measure	64049	93.7
	Difference of one offence	3818	5.6
	Difference of two or more offences	492	0.7
F3 vs F4	No difference in frequency measure	64059	93.7
	Difference of one court appearance	4054	5.9
	Difference of two or more court appearance	246	0.4

We are then left with a choice between F1 and F3. The disadvantage of using F3 is that it counts only contacts with the criminal justice system rather than proven offending. F1, in contrast, has the difficulty that not all offending is prosecuted – the measure does not include offences taken into consideration or those offences where prosecution is deemed not to be in the public interest. Surprisingly, although Table 4.1 shows a degree of difference between the two measures, the differences are not that large.

We therefore recommend the measure F1. It provides a more comprehensive measure of frequency of offending and, moreover, is compatible with the work of other Home Office agencies such as the Youth Justice Board.

4.4 The summary crime seriousness measures.

Our conclusion from the methodology on crime seriousness in Section 3 was that we preferred the correspondence analysis score, as it used more of the data, had good face validity and gave a greater spread of scores over the range. In this section, we use score A from this analysis rounded to the nearest integer. We can assign seriousness scores to each of the offences –however there will be some offences for which the methodology in Section 3 failed to give a score – these will be particularly rare offences which did not occur in our one month sample used to estimate the seriousness scores.

We consider two scenarios.

a) We start by analysing the 68,359 offenders defined previously. These offenders had 194,846 convictions with valid Home Office offence codes in the two year follow-up after the target conviction. Of these convictions, only 1,347 (0.7%) failed to be allocated a seriousness score.
b) We can instead adopt a less favourable scenario, and take a larger sample of offenders, this time including all offences with PNC offence codes, including those

that failed to translate to Home Office codes. This gave 216,732 offences of which 23,233 failed to be allocated a seriousness score (10.7%). This gives a more realistic picture of missing data when using the PNC in practice, but the majority of the offences without seriousness scores are for those without Home Office codes, and this situation is likely to change.

Returning to the first scenario, what are the Home Office offence codes which are not allocated seriousness scores? Of the 1,347 codes without seriousness scores, 807 (59.9%) relate to Home Office offence code 142.00 – 'offences by licensed persons or others acting on their behalf' e.g. permitting drunkenness on the premises or selling liquor to a drunken person, selling alcohol to those under 18. This is a code that is relatively frequent after January 2001 but failed to appear at all in the January 2001 sample. Presumably it is a new code. Similarly, codes 803.09, 803.10, 803.11 and 805.03 account for another 254 cases (18.9%) and are likely to refer to new motoring offences. These five codes account for over three quarters of the missing seriousness values.

Thus, the problem of missing seriousness scores is relatively minor. Mostly they appear to relate to new offences. In this case, a judgement needs to be made, and a provisional score allocated - this score would then be used until the seriousness measure is recalibrated with new data.

We now investigate the 193,499 offences which do have seriousness scores. We need to look at two questions – what is the distribution of these scores, and how is it best to summarise the scores over a follow-up period?

The distribution of the seriousness scores are given in the two histograms in Figure 4.2.

Figure 4.2. Histogram of seriousness scores for individual offences. The left histogram is unlogged on the vertical axis, whereas the right histogram has a logged vertical axis.

Histogram of individual offences - two year follow up.
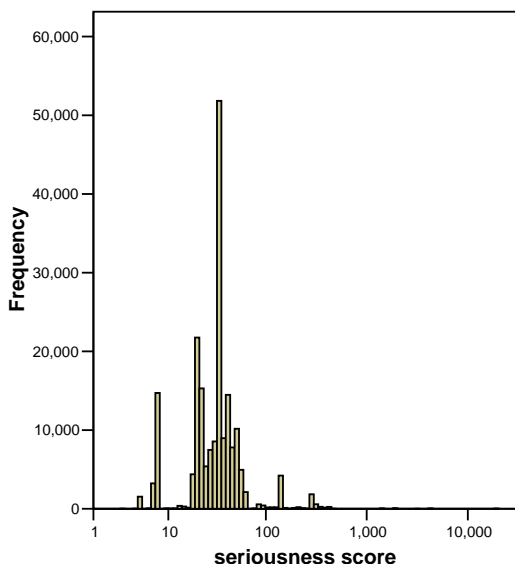
Histogram for individual offences - two year follow up.
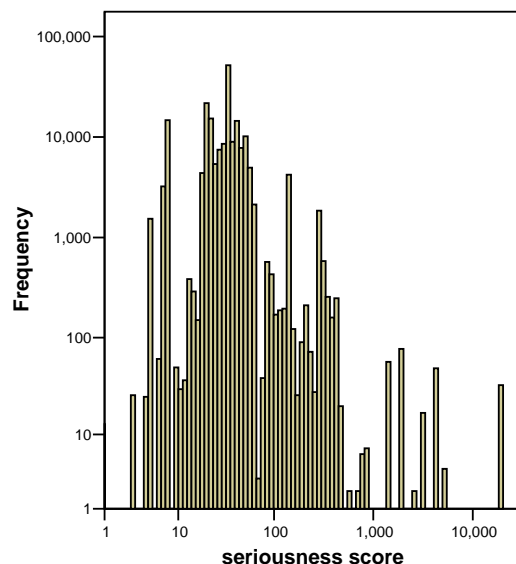
4.5 What summary measure is best for offence seriousness?

We now consider methods of *summarising* seriousness over a fixed period of time (typically a follow-up period, but also a period before a target offence). There are three methods which will be considered:

S1) the seriousness of the first offence which is committed after the target offence.
S2) the average seriousness of *all offences* over the two-year period.
S3) the seriousness of the worst offence over the two year period.

We discuss each of these in turn.

S1. The seriousness of the first offence committed after the target date is the simplest measure. The first offence to be recorded after the target date (based on the start date of offence) would be selected and its seriousness score noted. If more than one offence had the same start date, then the most serious of these would be selected. This measure is using very little of the follow-up data, and may have the disadvantage that the first offence after the target date may not be representative of the two-year period.

S2. This measure is using an average measure of seriousness over the period. We are not enthusiastic about this as we note that a serious offence might be mitigated in the averaging by a large number of more minor crimes. If such a measure were to be used, then a rapist with a string of theft offences would be deemed to be less serious than a rapist without the theft convictions.

S3. This measure looks at all offending over the two year period, and selects the most serious as a measure of offending. This measure has much to recommend it as it gives a measure of the degree of interest that the justice system should be taking in the offender.

The histograms and summary statistics for these three measures are presented on the following page in Figure 4.3, using logs for both axes, as before. The differences are small, but important.

To illustrate the differences between these scores we look at the offence of murder. The offenders in the sample committed 33 murders in the two-year follow-up period. What are the summary scores for these offenders over the two-year period?

- Taking the seriousness score of the first offence (S1) identifies some of the murders, but only if murder takes place as the first offence after the target offence. The scores are sometimes 20000, and sometimes very small.

- The average seriousness score (S2) downweights many of the murders by including minor offences.

- Finally, taking the most serious offence measure (S3), this will always have a score of 20000, and there is no discounting of the effect of a murder.

Figure 4.3 summary measures and histograms of the three summary seriousness measures.

S1. summarising seriousness over a fixed period - first offence
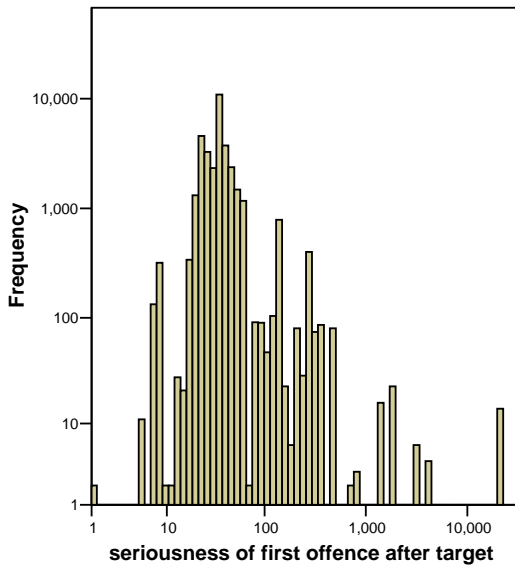
S2. summarising seriousness over a fixed period - average seriousness
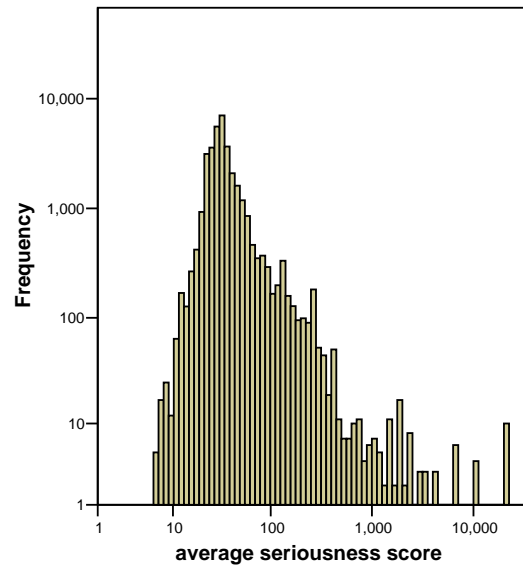
S3. summarising seriousness over a fixed period - highest seriousness score
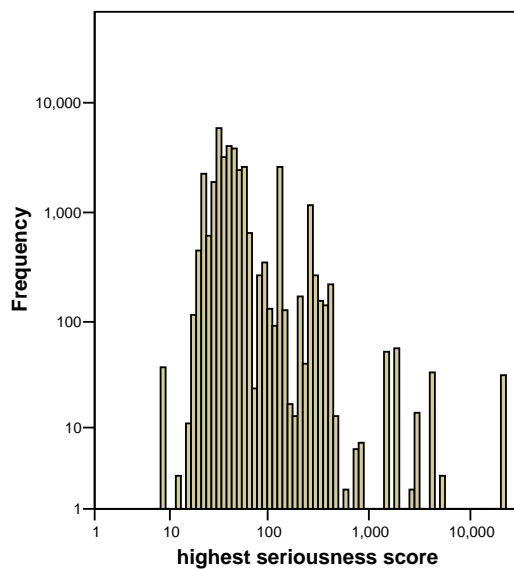
Summary measures of the three scores	First offence S1	Average S2	Worst S3
Mean	54.15	55.12	96.48
Standard deviation	415.67	390.92	640.77
Maximum	20000	20000	20000
Minimum	1	6.5	7
Skewness	3.93	3.95	5.64

The table below presents four of the 33 murder cases to illustrate how the various measures behave. All four homicide cases will have the worst seriousness score (S3) set to 20000. The seriousness score for the first offence measure(S1) will either be 20000, if murder is the first offence after the target, or a small score representing shoplifting (case 4).

The average seriousness score for murder (S2) varies according to how many other proved offences are committed within the two year period. For one of the offenders the average score has dropped to 6684 because of the inclusion of other minor offending.

Table 4.4 The three summary seriousness measures compared for four murderers

Offences in two-year follow-up	First offence score S1	Constituent offence scores	Average offence score S2	Worst offence score S3
Murder and attempted murder	20000	20000+5343	12672	20000
Murder and Public Order Act 1986 Sec.5 Harassment, alarm or distress.	20000	20000+25	10013	20000
Murder and other theft	20000	20000+49	10025	20000
Shoplifting, failing to surrender to bail, Murder	33	33+20+20000	6684	20000

It is clear that neither the score of the first offence S1, nor the average score S2 adequately describes the offending seriousness which has taken place in the two year period. We recommend that the worst offence score S3 be used as a summary of offence seriousness over a follow-up period.

5. Combined measures of seriousness and frequency– degrees of delinquency

In the previous section, we developed measures of severity/seriousness and frequency, and explored their behaviour in a two-year follow-up study. In this section, we now turn to the possibility of combining these measures into a single measure. This combined measure would represent the "degree of delinquency" of an offender, and would represent both the nature and amount of offending. We investigate the issues surrounding the development of such a measure, and the interpretation of a developed measure.

We can develop two approaches to developing a combined frequency and seriousness score:
- a) We form separate summaries of frequency and seriousness as in Section 4, and then combine them in some way.
- b) We form a combined summary of frequency and seriousness from the individual offence data.

We consider each of these in turn,

5.1 Combining separate summaries of frequency and seriousness

In section 4 we developed a preferred measure of frequency (F1: the number of proven offences), and a preferred measure of seriousness (S3: the worst offence score), which describe an offender's behaviour in a follow-up period.

We first examine the scatterplot of the two measures. We present the plot (Figure 5.1) logged on the x-scale because of the wide disparity of seriousness score values.

Figure 5.1 Scatterplot of frequency of offending (F1) against worst offence score (S3)
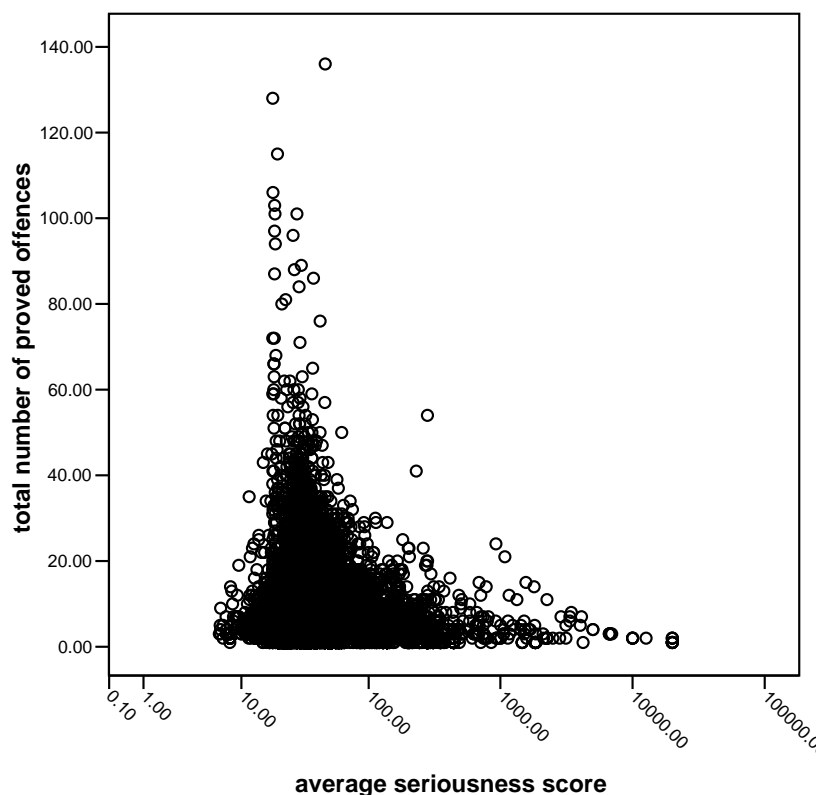
The plot shows some interesting features. We can see that those with the highest seriousness scores have a small frequency count. As the seriousness scores of the worst offence declines, a greater range of frequency values appears, with the greatest spread occurring with a seriousness score of around 20-25.

It is not clear to us whether it makes sense to combine these scores.   For example, we see that there is an offender with a "worst seriousness" score of around 1000 and a frequency count of around 20; there is another offender with a "worst seriousness" score of around 250 and a frequency count of around 50. Multiplying the seriousness score by the frequency would give both of these offenders a score of 20,000 and so we would be saying that both of these individuals would be equivalent to a murderer.

What is probably a better approach is to consider a grouping of the regions of the plot – perhaps into nine different regions, defined by low frequency, moderate frequency and high frequency, and low seriousness, moderate seriousness and high seriousness. The boundaries for these regions would be a matter of criminological judgement, but for illustrative purposes we have taken for frequency, the groups "less than 3 proven offences", "3 and less than 10 proven offences", and "10 or more proven offences", and for seriousness, the score B values of "3 or less", "4-5" and "6 or more". Table 5.1 gives the result for our data.

Table 5.1 categorised frequency and seriousness of offending

		frequency			Total
		low frequency	moderate frequency	high frequency	
Worst seriousness:	low seriousness	6938	3584	580	11102
	moderate seriousness	4687	10694	5357	20738
	high seriousness	459	1145	570	2174
Total		12084	15423	6507	34014

The high seriousness recidivists comprise about 6% of the sample of recidivists. The Criminal Justice system would be particularly concerned with the high frequency offenders (19% of recidivists) who were also committing serious offending. (1.7% of all recidivists).

5.2 A combined summary of frequency and seriousness from the individual offence data.

An alternative approach is to consider the seriousness scores of each offence and to sum them over the follow-up period. This makes the crucial assumption that the seriousness scores are additive and comprise a scale rather than an ordering. So, for example, we have already seen the seriousness scores presented in two ways – score A and score B. While it is clear that score B does not provide an additive measure (no one would equate two shoplifting offences (score 4) with the rape of a

female (score 8), the question is whether Score A does provide that measure, or whether a better transformation would provide a better additive measure.

We take the view that Score A provides a good starting point for an additive measure, but the measure should be verified by comparison with other information. For example, a small-scale survey of judges and magistrates could be asked to try to assess for example how many more times more serious a rape offence is to a shoplifting offence as one of a series of comparator measures.

On Score A for the correspondence analysis approach, we get the result that a shoplifting offence has a score of 35.60, whereas the rape of a female over 16 has a score of 3161.02 – the ratio is 88.79. For the average custodial sentence, we get the result that a shoplifting offence has a score of 28.46 whereas the rape of a female over 16 has a score of 7370.23 – a ratio of 258.96.

While there may be controversy at the top end of the scale, it is also clear that the lower end of the scale may not be interpretable in a ratio sense. For example, for Score A (correspondence analysis), we have the offence of shoplifting getting a score of 35.60 and defective brakes a score of 3.18. If we interpret the scale as additive, this implies that shoplifting is about ten times more serious than having defective brakes. However, a shift in scale so that the lowest value has a score of 10 (with the highest offence remaining at 20000), would change the scores to 12.1 for defective tyres and 42.2 for shoplifting – a ratio of about 3.5.

Thus, there is more validation work to do in converting this score to a ratio scale. However, taking the score at face value and assuming for the time being that it can be interpreted as a ratio scale, how might we proceed?

The simplest method would be simply to sum the scores to produce a total seriousness score over the follow-up for all proven offences. This score, which we term "total 2-year seriousness" is shown in the histogram in Figure 5.2 for all recidivist offenders.

Figure 5.2 Total seriousness score for all recivivist offenders
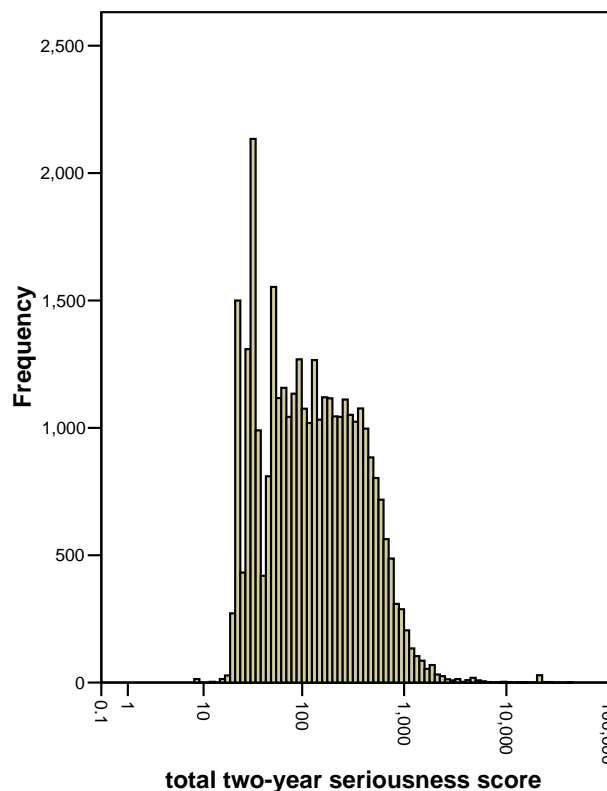
One problem with this approach is that of missing values. However, we have shown that the problem is relatively minor in scale. If we put aside the problem of PNC to Home Office offence code conversion, we have already shown that there are only 1347 offences out of a total of 194686 which did not have an estimated seriousness score. These offences were omitted in the above analysis but there are better approaches which have already been considered for estimating provisional scores for these offences.

We can examine offences at the top end of the scale. Table 5.2 below presents the 45 worst offenders according to the total seriousness score. We see that the most serious offender according to the total score committed two murders and gained a score of 40000. However, the third most serious offender according to the total seriousness score had a score of 25229 from 14 offences, of which the worst score was only 4227 (possession of firearms with intent).   A second example is ranked 45 in the list. This offenders committed 135 different offences, and has amassed a total score of 6272, but the worst offence in the two-year follow-up history had a score of only 50.

Table 5.2 The 45 worst offenders according to the total seriousness score

Rank order	Total two-year serious-ness	Worst serious-ness score	Number of offences	Rank order	Total two-year serious-ness	Worst serious-ness score	Number of offences
1	40000	20000	2	24	20033	20000	2
2	25343	20000	2	25	20025	20000	2
3	25229	4227	14	26	20000	20000	1
4	24654	20000	6	27	20000	20000	1
5	22535	4227	10	28	20000	20000	1
6	21307	20000	23	29	20000	20000	1
7	20886	20000	3	30	20000	20000	1
8	20646	20000	6	31	20000	20000	1
9	20570	20000	19	32	20000	20000	1
10	20529	20000	3	33	20000	20000	1
11	20320	20000	3	34	20000	20000	1
12	20309	20000	13	35	14674	4227	11
13	20166	20000	6	36	13987	4227	12
14	20150	20000	7	37	10935	1854	14
15	20139	20000	6	38	10343	4227	15
16	20122	20000	5	39	9454	4227	41
17	20086	20000	4	40	9103	4227	5
18	20056	20000	3	41	9076	4227	6
19	20053	20000	3	42	8533	1854	12
20	20049	20000	2	43	6728	4227	4
21	20040	20000	3	44	6319	3135	3
22	20037	20000	4	45	6272	50	135
23	20033	20000	2				

The decision here is ultimately a criminological one. The issue of scaling needs to be addressed if the decision is to proceed in the direction of summing offence scores. We discuss such issues further in the last section.

6. Conclusions

The tasks have been broadly accomplished. We have introduced a conceptual and technical framework for developing an offence seriousness scale and identified ways of measuring frequency of recidivism. In fact, we have done more. We have produced actual scores and examined the face validity of the scales. We have gone further. We have indicated a way of combining the scales so that a composite measure of seriousness and frequency is produced. Hence, while the technical problems have not been fully overcome and there is always scope for challenge, it seems that a tidy line can be drawn under the endeavour, for the feasibility study has, indeed, shown that the task is not only feasible but potentially usable. However, there's the rub, for one finally needs to address the question of how should one best use the scales and measures that have been developed. It is to that question we now turn.

However the scales and measures are used, they would seem to be a massive and important development on the simple dichotomy of success/failure on the basis of a reconviction within a prescribed period that is currently the routine measure. Nevertheless, we urge that we still need to proceed with caution, for they could be the source of misinformation, they could be misleading, they could be misused and may misdirect the public. Whatever else, however, as a result of our exposition in the previous sections, they should not be mysterious!

Essentially the crucial issue is one of deciding which scales to use. The offence seriousness scale and the measure of frequency are analytically distinct and separate scales and yet they have been combined to produce a composite measure of seriousness and frequency. The question is whether the composite scale is an appropriate way forward, for the use of that composite scale will inevitably diminish the importance and use of the two contributory scales. In brief, is the use of the composite scale sensible or unwise?

Sensible?

The composite scale seems the logical outcome of trying to summarise an offender's criminal record over a prescribed period. While both the offence seriousness score and the measure of frequency contribute to the composite scale, it has the added value of parsimony, that is, just one figure summarises. However, the parsimony and simplicity of the measure is also its shortcoming and potential danger, for it is likely to be used unthinkingly. So what should one be thinking about?

Unwise?

One could consider that the composite scale is produced by combining apples and oranges – 'seriousness' and 'frequency' are very different concepts. The most serious outcome is that different combinations of these very different concepts can produce identical scores. Put bluntly, one rape may equal 94 shoplifting convictions. In short, the procedure produces a spurious equivalence that is technically unjustified and morally unwise to display. It is technically unjustified because the seriousness score scale is fixed at arbitrary cut-points and shifting those cutpoints

will produce different results. It is morally unwise because it suggests that two sets of actions given the same score are morally equivalent. If displayed, there is no other reading of the outcome. Quite simply, it is morally repugnant to suggest that any number of shoplifting offences are equivalent to a rape, for instance, and we would be wise to avoid such a reading.

However, there is also a concern that is less related to morals but more to the operational focus. By focusing on the composite score, some potentially important information is either masked or lost. An offender can produce the same score by being either 'frequent but not serious' or 'serious but not frequent'. This distinction should not be lost for these are potentially very different offenders. In fact, the two measures of offence seriousness and frequency should be combined as a pattern rather than a score so that the very different moral quadrants are exposed: We have suggested a three by three table as a possible way of proceeding.

A three by three table provides a healthy compromise between spurious precision and imprecise simplicity. There is a gradient ranging from high to low on the seriousness scale and ranging from high frequency to low frequency on the frequency scale. The resulting nine-cell grid emerges from a complex analysis but is also meaningful on a commonsensical basis. Within each cell the range of both seriousness and frequency is circumscribed, so that one does not have the gross distortion of the same score (and thus residing in the same cell) being produced by being either 'frequent but not serious' or 'serious but not frequent'.

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Appendix A. Seriousness scores calculated through average sentence length

Offence code	Offence description	No. of cases	Mean custodial sentence length	Standard deviation	Score A	Score B
1.01	Common Law Murder of person >1 yr	20	9125	0	20000	10
77.56	Carry or concealing Class A drug on ship	1	5475	0	12000.4	9
2	Common Law Attempted murder	9	3913.89	3331.06	8578.96	9
19.08	Rape of female 16+	21	3362.38	2070.93	7370.23	9
19.07	Rape female <16	28	3285	1897.9	7200.64	9
8.16	Possession of firearm/imitation with intent	21	2857.38	3399.57	6263.44	9
92.06	Export Class A drug	5	2224	864.66	4875.28	8
92.07	Export Class B drug	1	2190	0	4800.76	8
92.03	Import Class A drug	29	2062.24	705.24	4520.76	8
4.01	Manslaughter	16	1973.75	2147.21	4326.81	8
92.72	Possession with intent to supply LSD	1	1825	0	4000.8	8
5.14	Possession of firearms etc with intent to endanger life or injure property etc (Group I)	7	1690	872.46	3704.92	8
92.01	Offence in relation to the unlawful importation of a controlled drug	8	1674.38	921.62	3670.68	8
81.16	Conversion of firearms (I)	4	1620	0	3551.51	8
92.1	Produce etc Cocaine	1	1460	0	3200.84	8
92.11	Produce etc Heroin	1	1460	0	3200.84	8
93.11	Permitting premises to be used for unlawful (drug-related) purposes:- Heroin	4	1460	842.93	3200.84	8
36.01	Common Law. Kidnapping	13	1415	2493	3102.21	8
29	Aggravated burglary/dwelling (inc attempts)	17	1395.88	2081.66	3060.32	8
3.03	Assist off impede prosecution	2	1367.5	1679.38	2998.11	8
92.34	Supplying etc Crack	40	1214	508.58	2661.69	8
4.06	Death by dangerous driving drink/drugs	9	1191.11	578.13	2611.52	8
19.09	Rape male <16	4	1186.25	862.46	2600.87	8
5.01	Wounding with intent (GBH)	112	1177.41	910.75	2581.5	8
35	Blackmail	14	1119.29	1728.65	2454.11	8
92.74	Possession with intent to supply Crack	22	1090.91	853.47	2391.91	8
92.7	Having possession of a controlled drug with intent to supply:-Cocaine	46	1036.85	793.03	2273.43	8
92.31	Supplying etc Heroin	233	1001.4	659.75	2195.74	8
92.71	Possession with intent to	130	988.85	704.43	2168.23	8

	supply Heroin					
19.11	Attempted rape of female <16	3	973.33	1685.86	2134.23	8
23.02	Other incest	12	969.17	405.98	2125.09	8
92.04	Import Class B drug	10	939	821.93	2058.98	8
92.39	Supply &c other class A drug	128	901.27	672.11	1976.28	8
8.13	Possession of firearm/imitation at arrest etc	10	875.5	864.08	1919.81	8
92.88	Having possession of a controlled drug with intent to supply: Other class C	3	845	581.79	1852.96	8
4.04	Death/dangerous driving	20	823	845.73	1804.75	7
8.33	Racially Aggravated GBH/malicious wounding	2	815	120.21	1787.21	7
99.23	Fraudulent evasion of duty etc other than drugs	55	769.36	1098.11	1687.19	7
11.03	Cruelty or neglect of children	18	768.61	1022.24	1685.54	7
53.16	Dishonestly procuring execution of a document	43	723.02	715.77	1585.63	7
74.01	Gross indecency with boys	50	708.6	803.06	1554.02	7
34.01	Robbery	667	700.21	770.7	1535.62	7
92.33	Supplying etc MDMA	69	634.28	693.16	1391.12	7
20.01	Indecent assault of female <16	384	624.7	656.68	1370.14	7
92.73	Possession with intent to supply MDMA	76	586.18	677.89	1285.72	7
92.3	Supplying etc Cocaine	31	567.74	564.74	1245.3	7
31	Aggravated burglary not dwelling	2	547.5	774.28	1200.94	7
53.38		1	540	0	1184.5	7
66.08	Breach Sex Offender Order	1	540	0	1184.5	7
34.02	Assault with intent to rob	12	535	577.57	1173.54	7
56.01	Arson endangering life.	55	522.64	695.4	1146.45	7
92.4	Supplying etc Amphetamine	24	521.04	261.49	1142.95	7
82.02	Offences against laws relating to Customs, Excise and Inland Revenue: triable either way	8	520.63	580.77	1142.04	7
81.27	Carry loaded firearm in public (II)	5	508	596.76	1114.37	7
81.72		5	468	414.39	1026.7	7
17.12	Indecent assault of male 16+	19	457.37	561.48	1003.4	7
8.02	Administer Poison to injure/annoy	2	450	636.4	987.25	7
24.01	Procuring female for immoral purposes/using drugs for intercourse	2	450	127.28	987.25	7
92.79	Possession/intent to supply other class A drug	58	449.34	507.32	985.82	7
24.06	Living on earnings of prostitution/exercising	2	405	190.92	888.63	7

	control					
53.04	Conspiracy to defraud	41	398.29	401.33	873.93	7
53.34	Computer Misuse Act/Unauthorised access/intent to commit offence	5	396	225.9	868.9	7
74.02	Gross indecency girls	80	389.94	340.1	855.61	7
92.8	Possession with intent to supply Amphetamine	33	382.27	378.19	838.82	7
20.02	Indecent assault of female 16+	117	375.47	591.66	823.91	7
17.11	Indecent assault male <16	69	372.61	470.24	817.64	7
8.29	Breach injunction harassment.	2	360	0	790	7
76	Suicide Aiding, Abetting etc	1	360	0	790	7
28.03	Other burglary in dwelling	1692	349.03	427.72	765.95	7
36.03	Common Law False imprisonment	13	348.46	386.57	764.71	7
92.89	Possession with intent to supply unspecified controlled drug	2	330	42.43	724.25	7
92.81	Possession with intent to supply Cannabis	218	312.84	471.55	686.64	7
28.02	Burglary in a dwelling/violence/threat	4	292.5	339.74	642.06	6
19.02	Unlawful intercourse with woman who is a defective	1	270	0	592.75	6
51.03	Frauds by company directors	2	270	127.28	592.75	6
53.99	Other Frauds	2	270	0	592.75	6
92.14	Produce etc Crack	1	270	0	592.75	6
53.31	Obtain money transfer by deception	183	263.28	299.28	578.02	6
8.01	Wounding or inflicting grievous bodily harm	68	250.29	262.85	549.56	6
57	Other criminal damage endangering life	14	245.71	551.87	539.52	6
8.23	Possession/firearm cause fear violence (I)	40	245.38	437.14	538.78	6
92.41	Supplying etc Cannabis	128	233.2	467.83	512.1	6
80	Escape lawful custody	37	227.84	306.2	500.35	6
66.22	Public Nuisance	17	217.94	795.18	478.66	6
92.45	Supplying or offering to supply a controlled drug:-	16	193.75	513.9	425.64	6
37.02	Aggravated vehicle taking causing injury/damage	4	180	254.56	395.5	6
79.01	Interfere with witness/fabrication evidence leading to wrongful conviction	191	179.42	411.7	394.23	6
92.85	Possession with intent to supply other class B drug	16	178.75	221.42	392.76	6
52.01		316	178.01	224.23	391.13	6
65	Violent Disorder	97	175.82	353.89	386.35	6
3.01	Make threats to kill	93	165.75	378.82	364.28	6
13.02	Abduction of a child by other persons	9	150	277.4	329.75	6
92.27	Produce etc anabolic	1	150	0	329.75	6

	steroids				
86.01	Possess obscene material for gain	29	137.52	108.69	302.39	6
22	Unlawful sexual intercourse girl under 16	53	136.98	205.21	301.22	6
8.34	Racially Aggravated ABH	9	134.44	241.25	295.66	6
8.38	Racially Aggravated, put in fear of violence	6	130	182.65	285.92	6
81.03	Possess firearm no certificate (I)	54	128.5	232.52	282.63	6
67.01	Perjury/false written statements	9	126.67	197.74	278.61	6
802	Dangerous driving	443	120.57	162.08	265.25	6
8.25	Possession/firearm fear of violence (group III)	3	120	103.92	264	6
83.03		4	120	84.85	264	6
84.01	False trade descriptions	85	114.71	106.29	252.4	6
39	Stealing from the person of another	335	107.89	218.1	237.46	5
8.35	Racially Aggravated common assault	26	105.85	159.91	232.98	5
92.48	Supplying or offering to supply a controlled drug:-	10	105	132.85	231.13	5
79.02	Intimidate juror/witness etc who is assisting in investigation of offences	78	100.58	147.78	221.43	5
55.03		3	100	91.65	220.17	5
81.35	Possession of firearms by person previously convicted (I)	14	97.14	198.7	213.91	5
61.23	Possess false instrument or materials to make false instrument	46	94.13	137.2	207.3	5
53.15	Dishonestly destroying, defacing or concealing a document	1	90	0	198.25	5
79.03	Harm/threat witness juror etc	8	90	78.56	198.25	5
92.67	Possession of Anabolic Steroids	2	90	127.28	198.25	5
30.02	Other burglary/building other than dwelling	1742	87.92	198.6	193.7	5
48.01	Theft etc of motor vehicle	253	85.41	211.51	188.19	5
41	Stealing by an employee	1019	82.32	210.14	181.41	5
92.21	Produce etc Cannabis	128	81.18	265.71	178.92	5
60.22	Use/copy false instrument	24	80.42	164.28	177.25	5
8.2	Assault/intent to resist apprehension etc	101	75.69	108.78	166.89	5
194.16	Make false statements &c to immigration	5	72	54.5	158.8	5
61.21	Other forgery – copy false instrument	164	70.4	160.37	155.29	5
61.22	Use/copy false instrument	223	67.04	130.01	147.93	5
49.1	Stealing not classified elsewhere	3633	64.4	200.02	142.14	5
86.05	Possessing video recording of unclassified work for supply	19	61.89	49.9	136.65	5
99.43	Drunkenness in aircraft	3	60	103.92	132.5	5

37.01	Aggravated Vehicle Take where driving leads to death	148	57.27	115.3	126.52	5
8.06	ABH	2364	57.07	193.21	126.09	5
54.01	Receiving stolen goods	1990	55.9	152.05	123.52	5
807.01	Drive whilst disqualified etc	3995	55.45	67.31	122.53	5
56.02	Arson not endangering life	171	55.13	227.82	121.84	5
66.01	Affray	998	54.91	127.61	121.34	5
86.02	Take/permit etc distribution etc of indecent photos of children	134	53.73	126.38	118.76	5
8.32	Breach ASBO	26	52.46	92.51	115.98	5
53.23	Obtain services by deception	215	51.6	96.45	114.09	5
66.04	False info relating to bombs	27	50	146.26	110.58	5
78.04	Non GB citizen obtains etc leave to enter or remain etc in UK	3	50	45.83	110.58	5
60.21	Forgery etc. prescription/scheduled drug etc	31	49.35	113.46	109.17	5
53.01	Obtain property by deception	2762	47.47	129.73	105.03	5
54.02	Undertaking or assisting in the retention, removal, disposal or realisation of stolen goods or arranging to do so	285	46.32	114.59	102.51	5
8.3	Putting people in fear of violence.	97	45.07	89.71	99.78	5
67.02	Perjury/false statements	4	45	90	99.63	5
81.36	Possession of firearms by person previous convicted (II)	2	45	63.64	99.63	5
105.04	Assaulting a prison custody officer	4	45	30	99.63	5
92.54	Possession of Crack	66	43.61	159.33	96.57	5
8.31	Breach of restraining order.	67	41.61	104.56	92.2	5
66.09	Racially aggravated fear/provocation violence	50	40.12	103.66	88.93	4
93.3	Obstruct search for drugs	24	37.71	130.33	83.64	4
81.17	Possesion/distribution of weapon etc(I)	87	35.86	103.91	79.6	4
53.02	Obtaining pecuniary advantage by deception	102	35.48	90.76	78.76	4
45.1	Stealing from motor vehicles	1188	30.28	81.95	67.37	4
99.3	Assist offender (triable either way)	1	30	0	66.75	4
108.11	Cruelty to animals. Relating to disqualification	4	30	0	66.75	4
53.24	Evasion of liability by deception	51	28.78	75.41	64.09	4
40	Stealing in dwelling other than automatic meters	321	28.13	71.28	62.65	4
92.55	Possession of Methadone	45	27.73	114.12	61.78	4

130.01	Unauthorised taking of motor vehicle etc	1707	27.47	61.13	61.21	4
47	Stealing from automatic machines and meters.	83	27.47	84.1	61.2	4
33	Going equipped for stealing etc	338	26.8	72.47	59.74	4
59.11	Threat to commit criminal damage:-	61	25.82	142.67	57.59	4
92.51	Possession of Heroin	777	24.75	110.03	55.23	4
93.21	Permit premises to be used for Cannabis	23	23.48	112.6	52.46	4
61.26	Possess counterfeit notes/coins	25	22.8	55.64	50.97	4
53.25	Making off without payment	333	22.17	63.24	49.6	4
92.5	Possession of Cocaine	310	21.28	103.76	47.65	4
61.25	Pass etc. counterfeit notes/coins	26	20.77	43.9	46.52	4
104.23	Assault on a constable	934	20.61	42.74	46.17	4
92.52	Possession of L S D	19	18.95	64.2	42.53	4
73.03	Failure to notify police of name (Sexual Offences)	13	18.46	35.79	41.46	4
115.28	Loaded firearm public place	43	18.14	85.39	40.76	4
42	Take away/open mail bag	24	18.13	56.18	40.72	4
8.11	Possess offensive weapons without lawful authority etc	1021	17.31	64.36	38.94	4
43	Abstracting electricity	97	17.03	45.92	38.33	4
195.26	Public Libraries and Museums Act Offences against L A bylaws	99	16.88	36.87	37.99	4
807.9	Other driving licence offences	48	16.88	116.91	37.98	4
92.53	Possession of MDMA	451	15.6	72.29	35.19	4
92.59	Having possession: other class A	559	15.42	73.58	34.79	4
803.09		101	15.11	39.97	34.11	4
8.37	Racially aggravated harassment	12	15	51.96	33.88	4
26	Bigamy	4	15	30	33.88	4
92.49	Supply etc drug Class unspecified	2	15	21.21	33.88	4
195.79	Failure to comply/licence conditions following return to prison	52	14.33	35.61	32.4	3
130.02	Unauthorised take conveyance (not motor vehicle or cycle)	21	14.29	46.11	32.31	3
108.02	Cruelty to Animals	91	14.13	41.75	31.97	3
195.63	Violence Criminal .Law Act securing entry	39	13.79	30.63	31.23	3
803.11		28	13.79	37.67	31.21	3
8.26	Have blade in public place	665	13.78	45.83	31.2	3
5.11	Causing danger interfering with a vehicle etc	20	13.5	60.37	30.59	3
126	Interfering with motor vehicles	511	13.21	37.25	29.95	3

53.2	Railway Frauds	7	12.86	34.02	29.18	3
59.13	Possession with intent to commit criminal damage	14	12.86	32.68	29.18	3
46	Shoplifting	16081	12.53	40.21	28.46	3
49.12	Stealing conveyance other than Motor Vehicle or cycle.	5	12	26.83	27.3	3
81.04	Possess shotgun no certificate	30	12	65.73	27.3	3
44	Stealing pedal cycles	184	11.39	32.95	25.95	3
814.04	Work records falsification (vehicles)	53	11.32	35.41	25.81	3
92.6	Possession of Amphetamine	320	11.32	44.14	25.8	3
803.03	Drive &c not provide police with specimen	624	11.13	33.26	25.39	3
105.01	Common assault and battery	4813	9.7	48.47	22.25	3
803.1		55	9.38	30.9	21.56	3
8.36	Racially aggravated intentional harassment/alarm/distress	69	9.33	28.31	21.46	3
125.58	Racially-aggravated harassment, alarm or distress	87	8.76	37.52	20.2	3
53.33	Dishonest representation for obtaining benefit	577	8.18	36.55	18.94	3
73.04	Failure to notify address(Sexual Offences)	27	7.7	19.59	17.88	3
151.14	False representations social .security	1507	7.57	35.4	17.6	3
86.1	Possession of indecent photo child	66	7.27	26.34	16.94	3
58.01	Racially aggravated other criminal damage	589	6.93	40.6	16.18	3
83.01	Abscond etc bail	6642	6.6	23.34	15.47	3
125.11	Fear or provocation of violence	1896	6.5	30.17	15.26	3
195.67	Failure of young offender to comply with supervision requirement	61	6.51	19.33	15.26	3
803.02	Drink/drugs Driving etc	6929	6.33	27.01	14.88	3
195.94	Offence of harassment	456	6.13	25.11	14.43	3
185.01	Being on enclosed premises for an unlawful purpose	71	6.11	21.55	14.4	3
805.03		50	6	24.24	14.15	3
814.03	Registration and licensing forgery deception	319	5.92	39.83	13.99	3
99.99	Other Indictable Offences	1531	5.85	45.43	13.83	3
58	Other criminal damage (explosives)	2383	5.35	33.97	12.73	3
99.84		18	4.67	6.79	11.23	2
149	Malicious damage	4628	4.45	30.47	10.74	2
803.05	Drink/drug driving of mechanical propelled vehicle	171	4.39	17.42	10.61	2
104.33	Resist or obstruct PC/assault	1652	4.18	13.96	10.16	2

803.07	Fail to give specimen for preliminary test	230	3.72	18.24	9.15	2
805.01	Fail to stop after accident	609	3.62	19.31	8.94	2
195.99	All summary offences not specified elsewhere	826	3.61	25.31	8.91	2
92.68	Possession of other Class C drug	56	3.59	24.09	8.87	2
92.61	Possession of Cannabis	5565	3.12	39.42	7.83	2
105.03	Assault a person assisting a constable	16	2.81	8.04	7.16	2
139	Indecent exposure/insult female	47	2.79	13.3	7.11	2
8.21	In charge of a dog out of control	44	2.73	18.09	6.98	2
125.09	Intentional harassment causing alarm/distress	69	2.17	11.87	5.76	2
195.41		15	2	7.75	5.38	2
805.02	Fail to report accident within 24 hrs	401	2	14.6	5.38	2
195.56	APO Order failure to comply	65	1.85	14.88	5.05	2
92.65	Possession of other class B drug	310	1.78	13.33	4.9	2
803.06	Fail to give specimen/driving mechanically propelled vehicle	33	1.33	5.69	3.92	1
162.03	Town Police Clauses Act 1847 other offences (against Police	24	1.25	6.12	3.74	1
92.69	Possession of unspecified controlled drug	38	0.74	4.54	2.61	1
141.12	Drunk in charge of under 7yr old	33	0.42	2.44	1.93	1
125.12	Cause harassment, alarm or distress	2396	0.22	4.88	1.49	0
825.9	Miscellaneous offences Road Traffic Act	600	0.17	3.72	1.38	0
809.01	Uninsured motor vehicle uninsured	6817	0.15	3.18	1.33	0
182	Begging, wandering etc	14	0.07	0.27	1.16	0
807.02	Drive &c contrary to conditions of licence	2072	0.07	3.3	1.16	0
141.01	Drunk and disorderly (public place)	4065	0.03	1.48	1.07	0
140.01	Being found drunk in a highway / public (not a building)	104	0.02	0.14	1.04	0
818.9	Neglect traffic directions. other (Road Traffic Act)	73	0.01	0.12	1.03	0
166.04	Common prostitute loitering or soliciting	467	0.01	0.08	1.01	0
8.22	In charge dog in non-public place and allowing it to injure.	1	0	0	1	0
8.27	Having blade in school	7	0	0	1	0
8.28	Possession of offensive weapon school premises	10	0	0	1	0
15	Concealment of birth.	1	0	0	1	0

21	Unlawful sexual intercourse with girl under 13	3	0	0	1	0
27	Man soliciting	2	0	0	1	0
36.02	Hijacking/endangering life etc	1	0	0	1	0
45.11	Stealing from other vehicles	6	0	0	1	0
52	False accounting	1	0	0	1	0
53.32	Dishonestly obtain goods with false credit	4	0	0	1	0
53.35	Unauthorised modification of computer material (Computer Misuse Act)	3	0	0	1	0
55.01	Offences in relation to bankruptcy and Insolvency	24	0	0	1	0
55.02		2	0	0	1	0
55.04		1	0	0	1	0
55.05		3	0	0	1	0
61.24	Make counterfeit notes/coins	5	0	0	1	0
66.03	Place etc bomb hoax	4	0	0	1	0
66.21	Act outrage public decency	6	0	0	1	0
66.99	Instruct in terrorism/invite another in weapon training	11	0	0	1	0
75.56	Restrictions on sale of maintenance of gaming machines	2	0	0	1	0
81.09	Sell firearm to person without certificate (I)	2	0	0	1	0
81.26	Carrying loaded firearm in public (I)	1	0	0	1	0
81.29	Trespassing with firearm etc in building (I)	2	0	0	1	0
81.3	Trespass with firearm in building (group II)	1	0	0	1	0
81.37	Possess firearms person previously convicted (III)	2	0	0	1	0
84.02	False/misleading indications as to price of goods	5	0	0	1	0
84.03	False/misleading statements as to services	8	0	0	1	0
84.08	Unauthorised use of trademark.	86	0	0	1	0
84.09	Falsification of Register etc (Copyright etc Act)	13	0	0	1	0
86.03	Displaying indecent matter	1	0	0	1	0
86.04	Supplying video recording of unclassified work	8	0	0	1	0
87.02	Unlawful harassment of occupier (Protection from Eviction Ac	1	0	0	1	0
89.05	Selling food not complying with food safety	18	0	0	1	0

89.07	Falsely describe food	2	0	0	1	0
91.15	Deposit &c controlled waste	21	0	0	1	0
91.17	Handle &c controlled waste w/out reasonable measures	2	0	0	1	0
92.02	Offences in relation to exportation of controlled drugs	2	0	0	1	0
92.13	Production of MDMA	1	0	0	1	0
92.19	Production of a controlled drug: other class A	2	0	0	1	0
92.35	Supplying etc Methadone	4	0	0	1	0
92.95		1	0	0	1	0
93.13	Permitting premises to be used MDMA	2	0	0	1	0
93.15	Permit premises to be used: Methadone	1	0	0	1	0
93.19	Permit premises to be used other class A drugs	6	0	0	1	0
93.2	Permitting premises to be used Amphetamine	2	0	0	1	0
93.28	Permit premises to be used other class C	1	0	0	1	0
99.06	Personation	1	0	0	1	0
99.29	Assist offender triable on indictment only	1	0	0	1	0
99.85		2	0	0	1	0
99.87		1	0	0	1	0
104.31	Resist or obstruct PC assault	1	0	0	1	0
105.02	Assaults – Common	1	0	0	1	0
105.06	Assaulting a court security officer	1	0	0	1	0
108.14	Abandonment of animals	2	0	0	1	0
108.17	Animals (Cruel Poisons)	2	0	0	1	0
108.21	Agriculture Cruelty to animals	7	0	0	1	0
111.18	dog out of control – no injury caused	4	0	0	1	0
111.19	Dog out of control – injury caused)	3	0	0	1	0
112.01	Education Acts, 1944 -53	7	0	0	1	0
115.04	Non-comply firearm certificate not aggravated	4	0	0	1	0
115.06	Non-comply Shot Gun Certificate	10	0	0	1	0
115.22	False statement- firearms permit	1	0	0	1	0
115.31	Trespass with firearm in build (group III)	1	0	0	1	0
115.32	Trespass with firearm on land (I)	1	0	0	1	0
115.34	Trespass with firearm on land (III)	5	0	0	1	0
115.46	Under 14/have air weapon etc (III)	6	0	0	1	0
115.47	Under 17/have air weapon etc (III)	15	0	0	1	0

115.5	Sell firearm to under 17 (I)	1	0	0	1	0
115.55	Supply air weapon to under 14 (III)	2	0	0	1	0
115.6	False statement to obtain etc renewal of shotgun cert (II)	1	0	0	1	0
115.88	Failing to report transaction authorised by a visitors shot	1	0	0	1	0
115.95	Failure to give notice in writing of transfers (shotguns) to	1	0	0	1	0
116.06	Salmon and Freshwater Fisheries Act 1975 Bylaws	6	0	0	1	0
116.11	Take/destroy fish in private	7	0	0	1	0
118.01	Night poaching	1	0	0	1	0
119.01	Day poaching	22	0	0	1	0
121.06	Laying poison to destroy or injure game	2	0	0	1	0
121.11	Offence against deer	1	0	0	1	0
122.06	Pedestrian on motorway	1	0	0	1	0
122.07	Obstructions (Highways Act)	3	0	0	1	0
123.02	Nuisances other than those caused by vehicles	3	0	0	1	0
123.05	Cause danger etc (Highways Act)	2	0	0	1	0
125.05	Break up public meeting	2	0	0	1	0
125.28	Take part/racialist or indecent (football)	2	0	0	1	0
125.29	Go on play area etc (football)	27	0	0	1	0
125.3	Entering premises in breach of domestic football banning order	1	0	0	1	0
125.33	Disrupt lawful activity etc	1	0	0	1	0
125.35	Fail to leave residential premises when required to do so	1	0	0	1	0
131.01	Aggravated vehicle taking criminal damage	4	0	0	1	0
137.07	Pedal cycles - riding on footpath	1	0	0	1	0
137.13	Ride cycle drunk etc	1	0	0	1	0
137.18	Take cycle without consent	49	0	0	1	0
137.99	Other Offs - cycles.	1	0	0	1	0
140.06	Drunk etc at sports events	43	0	0	1	0
141.02	Drunk in charge horse etc	3	0	0	1	0
141.03	Drunk/possess loaded firearms	1	0	0	1	0
143.01	Selling intoxicating Liquor without licence	4	0	0	1	0
143.16	Person under 18 buy &c alcohol	3	0	0	1	0
143.62	Possession of alcohol at sporting event	16	0	0	1	0

145.01	Trade Unions etc Act 1992 - intimidation	2	0	0	1	0
147.01	Begging (Children's Act)	1	0	0	1	0
151.15	Job seekers Act (all offences)	19	0	0	1	0
164.03	Obstruction in streets	3	0	0	1	0
164.07	False alarms of fire	14	0	0	1	0
164.11	Regulating traffic in Greater London	1	0	0	1	0
164.12	Wilfully /indecently exposing the person	22	0	0	1	0
165.01	Kerb – crawling	10	0	0	1	0
165.02	Persistent soliciting of women for prostitution	5	0	0	1	0
168.3	Misuse of Fire Hydrant, damaging	1	0	0	1	0
168.82	EP 1990	4	0	0	1	0
168.91	EP 1990	2	0	0	1	0
169.01	Offences related to railways	8	0	0	1	0
169.2	Throwing stones (Transport Act)	1	0	0	1	0
170	Keep motor vehicle with no licence	33	0	0	1	0
173.2	Touting for hire car services in a public place	4	0	0	1	0
188.05	Collecting alms/endeavouring to procure charitable contributions	3	0	0	1	0
191	Wireless telegraphy licences - sale/hire of tv sets	4	0	0	1	0
193.46	Supply etc of articles for administering or preparing controlled drugs	1	0	0	1	0
194.02	Non - patrial entering UK without leave	1	0	0	1	0
194.03	Non -patrial having only ltd leave in UK beyond time limit	3	0	0	1	0
194.18	Possess false passport etc	1	0	0	1	0
195.08	Failure to stop when required to do so	2	0	0	1	0
195.21	Matters concerning Magistrates Courts	92	0	0	1	0
195.46	Relating to prisons and other institutions for offenders	6	0	0	1	0
195.5	Refuse Disposal/Dumping	3	0	0	1	0
195.53	Waste police employment	27	0	0	1	0
195.55	Reparation Order Failure to comply	25	0	0	1	0
195.59	Unauthorised access to computer material	2	0	0	1	0
195.62	Contravention of airport authority by-laws	1	0	0	1	0
195.74	Wilfully obstructing person	6	0	0	1	0

	acting in exercise of right of					
195.91	Impersonation/police officer	3	0	0	1	0
803.12		5	0	0	1	0
804.01	Careless driving - without due care and attention	452	0	0	1	0
804.9	Racing on highway	1	0	0	1	0
807.04	Drive after false declaration as to fitness etc	4	0	0	1	0
809.9	Failure to supply police with particulars	29	0	0	1	0
810.9	Drive with excess passengers (trade)	6	0	0	1	0
811.01	Installation/recording equipment. Failing to keep proper records	2	0	0	1	0
811.02	Fail to observe limits on hours of driving etc	4	0	0	1	0
812	Operators licence offences	1	0	0	1	0
813	Vehicle Test Offences	925	0	0	1	0
814.01	deceive/forge driving licence	16	0	0	1	0
814.02	Deceive/forge (insurance)	56	0	0	1	0
814.06	Vehicle test certificate (fraudulently using etc)	31	0	0	1	0
815.01	Defective brakes (Road Traffic Act)	1	0	0	1	0
815.03	Tyres defective Road Traffic Act	28	0	0	1	0
815.04	Loading offences (Road Traffic Act)	12	0	0	1	0
815.9	Vehicles in dangerous/defective condition (Other offences, Road Traffic Act)	9	0	0	1	0
816.01	Speeding (motorways)	57	0	0	1	0
816.11	Speeding (motorways, caught by camera)	10	0	0	1	0
817	Motorway offences (other than speeding)	1	0	0	1	0
819.01	Neglect of pedestrian rights	1	0	0	1	0
820.9	Wilful/unnecessary obstruction (Highways Act)	1	0	0	1	0
821	Lighting offences (Road Traffic Act)	14	0	0	1	0
822	Noise offences (Road Traffic Act)	2	0	0	1	0
823.01	Dangerous load/number of persons carried (Road Traffic Act)	2	0	0	1	0
824.01	Motor Cycle/not wearing protective helmets (Road Traffic Act)	9	0	0	1	0
825.02	Unlawful pillion riding	9	0	0	1	0

	(Road Traffic Act)					
825.03	Failure to give name &c after accident	22	0	0	1	0
825.06		8	0	0	1	0

Appendix B: Offence seriousness scores based on Correspondence Analysis approach

Offence code	Offence Description	Raw score	Standard error	Score A	Score B
1.01	Common Law Murder of person >1 yr	64.01	4.666	20000	10
2	Common Law Attempted murder	17.048	4.785	5361.93	9
8.16	Possession of firearm/imitation with intent	13.433	4.965	4235.14	8
19.08	Rape of female 16+	9.987	4.257	3161.02	8
19.07	Rape female <16	8.534	4.48	2708.12	8
77.56	Carry or concealing Class A drug on ship	7.551	14.314	2401.72	8
36.01	Common Law. Kidnapping	5.837	1.08	1867.46	8
4.01	Manslaughter	5.819	1.849	1861.85	8
29	Aggravated burglary/dwelling (inc attempts)	4.6	1.652	1481.89	7
92.06	Export Class A drug	3.519	3.65	1144.94	7
92.03	Import Class A drug	2.643	2.046	871.89	7
92.01	Offence in relation to the unlawful importation of a controlled drug	2.542	2.341	840.41	7
3.03	Assist off impede prosecution	2.511	3.021	830.75	7
5.14	Possession of firearms etc with intent to endanger life or injure property etc (Group I)	2.341	2.212	777.76	7
81.16	Conversion of firearms (I)	1.805	0.964	610.69	6
92.07	Export Class B drug	1.805	0.964	610.69	6
92.72	Possession with intent to supply LSD	1.805	0.964	610.69	6
19.11	Attempted rape of female <16	1.641	1.974	559.57	6
35	Blackmail	1.423	1.969	491.62	6
5.01	Wounding with intent (GBH)	1.317	1.155	458.58	6
92.1	Produce etc Cocaine	1.269	1.521	443.61	6
92.11	Produce etc Heroin	1.269	1.521	443.61	6
19.09	Rape male <16	1.182	1.241	416.5	6
93.11	Permitting premises to be used for unlawful (drug-related) purposes:- Heroin	1.14	0.608	403.41	6
8.13	Possession of firearm/imitation at arrest etc	1.129	0.962	399.98	6
92.04	Import Class B drug	1.118	0.933	396.55	6
92.74	Possession with intent to supply Crack	1.097	0.83	390	6
92.34	Supplying etc Crack	1.078	0.712	384.08	6
92.7	Having possession of a controlled drug with intent to supply:-Cocaine	1.066	0.65	380.34	6
92.71	Possession with intent to supply Heroin	1.035	0.837	370.68	6

4.06	Death by dangerous driving drink/drugs	1.02	0.841	366	6
99.23	Fraudulent evasion of duty etc other than drugs	0.988	0.914	356.03	6
92.31	Supplying etc Heroin	0.899	0.685	328.29	6
92.39	Supply &c other class A drug	0.869	0.53	318.93	6
11.03	Cruelty or neglect of children	0.843	0.762	310.83	6
23.02	Other incest	0.794	0.666	295.56	6
34.01	Robbery	0.779	0.508	290.88	6
4.04	Death/dangerous driving	0.757	1.022	284.02	6
74.01	Gross indecency with boys	0.743	0.639	279.66	6
8.33	Racially Aggravated GBH/malicious wounding	0.718	0.71	271.87	6
92.88	Having possession of a controlled drug with intent to supply: Other class C	0.698	0.72	265.63	6
53.16	Dishonestly procuring execution of a document	0.689	1.151	262.83	6
20.01	Indecent assault of female <16	0.639	0.479	247.24	6
34.02	Assault with intent to rob	0.633	0.548	245.37	6
92.33	Supplying etc MDMA	0.592	0.387	232.59	5
92.73	Possession with intent to supply MDMA	0.539	0.45	216.07	5
92.3	Supplying etc Cocaine	0.529	0.29	212.96	5
56.01	Arson endangering life.	0.519	0.98	209.84	5
53.38		0.475	0.391	196.12	5
66.08	Breach Sex Offender Order	0.475	0.391	196.12	5
81.27	Carry loaded firearm in public (II)	0.428	0.422	181.47	5
92.4	Supplying etc Amphetamine	0.405	0.228	174.31	5
82.02	Offences against laws relating to Customs, Excise and Inland Revenue: triable either way	0.399	0.214	172.44	5
31	Aggravated burglary not dwelling	0.382	0.511	167.14	5
92.79	Possession/intent to supply other class A drug	0.375	0.259	164.95	5
53.34	Computer Misuse Act/Unauthorised access/intent to commit offence	0.373	0.311	164.33	5
8.02	Administer Poison to injure/annoy	0.371	0.523	163.71	5
81.72		0.362	0.405	160.9	5
20.02	Indecent assault of female 16+	0.36	0.272	160.28	5
24.01	Procuring female for immoral purposes/using drugs for intercourse	0.359	0.27	159.97	5
24.06	Living on earnings of prostitution/exercising control	0.359	0.27	159.97	5
53.04	Conspiracy to defraud	0.351	0.641	157.47	5
17.12	Indecent assault of male	0.344	0.235	155.29	5

	16+				
74.02	Gross indecency girls	0.305	0.261	143.14	5
28.02	Burglary in a dwelling/violence/threat	0.303	0.809	142.51	5
28.03	Other burglary in dwelling	0.301	0.231	141.89	5
36.03	Common Law False imprisonment	0.298	0.229	140.95	5
92.8	Possession with intent to supply Amphetamine	0.288	0.169	137.84	5
66.22	Public Nuisance	0.286	0.35	137.21	5
17.11	Indecent assault male <16	0.285	0.156	136.9	5
92.81	Possession with intent to supply Cannabis	0.277	0.252	134.41	5
8.29	Breach injunction harassment.	0.242	0.305	123.5	5
19.02	Unlawful intercourse with woman who is a defective	0.242	0.305	123.5	5
53.99	Other Frauds	0.242	0.305	123.5	5
76	Suicide Aiding, Abetting etc	0.242	0.305	123.5	5
92.14	Produce etc Crack	0.242	0.305	123.5	5
92.89	Possession with intent to supply unspecified controlled drug	0.242	0.305	123.5	5
92.41	Supplying etc Cannabis	0.224	0.162	117.89	5
8.01	Wounding or inflicting grievous bodily harm	0.22	0.68	116.64	5
57	Other criminal damage endangering life	0.209	0.132	113.21	5
3.01	Make threats to kill	0.189	0.441	106.98	5
13.02	Abduction of a child by other persons	0.187	0.908	106.35	5
8.23	Possession/firearm cause fear violence (I)	0.18	0.129	104.17	5
53.31	Obtain money transfer by deception	0.162	0.089	98.56	5
79.01	Interfere with witness/fabrication evidence leading to wrongful conviction	0.156	0.176	96.69	5
65	Violent Disorder	0.144	0.301	92.95	5
80	Escape lawful custody	0.143	0.325	92.64	5
51.03	Frauds by company directors	0.134	0.133	89.83	4
52.01		0.126	0.099	87.34	4
92.45	Supplying or offering to supply a controlled drug:-	0.125	0.079	87.03	4
92.85	Possession with intent to supply other class B drug	0.124	0.103	86.72	4
37.02	Aggravated vehicle taking causing injury/damage	0.114	0.501	83.6	4
22	Unlawful sexual intercourse girl under 16	0.102	0.097	79.86	4
8.38	Racially Aggravated, put in fear of violence	0.093	0.082	77.05	4
67.01	Perjury/false written statements	0.083	0.114	73.94	4
8.34	Racially Aggravated ABH	0.067	0.069	68.95	4
195.99	All summary offences not specified elsewhere	0.067	0.124	68.95	4

79.02	Intimidate juror/witness etc who is assisting in investigation of offences	0.056	0.451	65.52	4
39	Stealing from the person of another	0.055	0.044	65.21	4
8.35	Racially Aggravated common assault	0.054	0.199	64.9	4
86.01	Possess obscene material for gain	0.054	0.069	64.9	4
8.25	Possession/firearm fear of violence (group III)	0.053	0.878	64.59	4
81.03	Possess firearm no certificate (I)	0.048	0.039	63.03	4
30.02	Other burglary/building other than dwelling	0.047	0.078	62.72	4
48.01	Theft etc of motor vehicle	0.042	0.158	61.16	4
86.02	Take/permit etc distribution etc of indecent photos of children	0.039	0.041	60.22	4
41	Stealing by an employee	0.029	0.036	57.11	4
84.01	False trade descriptions	0.029	0.052	57.11	4
92.48	Supplying or offering to supply a controlled drug:-	0.026	0.052	56.17	4
92.27	Produce etc anabolic steroids	0.025	0.206	55.86	4
169.01	Offences related to railways	0.024	0.438	55.55	4
92.21	Produce etc Cannabis	0.022	0.155	54.92	4
8.06	ABH	0.021	0.034	54.61	4
83.03		0.021	0.16	54.61	4
8.32	Breach ASBO	0.019	0.391	53.99	4
56.02	Arson not endangering life	0.019	0.05	53.99	4
81.35	Possession of firearms by person previously convicted (I)	0.019	0.047	53.99	4
8.2	Assault/intent to resist apprehension etc	0.017	0.15	53.37	4
37.01	Aggravated Vehicle Take where driving leads to death	0.017	0.126	53.37	4
21	Unlawful sexual intercourse with girl under 13	0.016	0.112	53.05	4
66.01	Affray	0.016	0.064	53.05	4
66.04	False info relating to bombs	0.016	0.075	53.05	4
59.11	Threat to commit criminal damage:-	0.015	0.379	52.74	4
61.21	Other forgery – copy false instrument	0.015	0.03	52.74	4
49.1	Stealing not classified elsewhere	0.012	0.025	51.81	4
15	Concealment of birth.	0.009	0.072	50.87	4
99.29	Assist offender triable on indictment only	0.009	0.072	50.87	4
79.03	Harm/threat witness juror etc	0.007	0.415	50.25	4
61.22	Use/copy false instrument	0.004	0.025	49.31	4
86.1	Possession of indecent photo child	0.004	0.065	49.31	4
115.31	Trespass with firearm in build (group III)	0.004	0.739	49.31	4

61.23	Possess false instrument or materials to make false instrument	0.003	0.104	49	4
53.01	Obtain property by deception	0.001	0.057	48.38	4
54.01	Receiving stolen goods	0.001	0.018	48.38	4
60.22	Use/copy false instrument	0	0.067	48.07	4
60.21	Forgery etc. prescription/scheduled drug etc	-0.001	0.108	47.76	4
195.74	Wilfully obstructing person acting in exercise of right of	-0.002	0.074	47.44	4
54.02	Undertaking or assisting in the retention, removal, disposal or realisation of stolen goods or arranging to do so	-0.004	0.067	46.82	4
92.67	Possession of Anabolic Steroids	-0.006	0.112	46.2	4
8.3	Putting people in fear of violence.	-0.008	0.077	45.57	4
805.03		-0.009	0.018	45.26	4
53.23	Obtain services by deception	-0.01	0.044	44.95	4
105.06	Assaulting a court security officer	-0.01	0.939	44.95	4
81.09	Sell firearm to person without certificate (I)	-0.014	0.042	43.7	4
81.29	Trespassing with firearm etc in building (I)	-0.014	0.042	43.7	4
130.01	Unauthorised taking of motor vehicle etc	-0.015	0.022	43.39	4
55.03		-0.016	0.123	43.08	4
66.09	Racially aggravated fear/provocation violence	-0.017	0.082	42.77	4
92.54	Possession of Crack	-0.017	0.05	42.77	4
42	Take away/open mail bag	-0.019	0.064	42.14	4
45.1	Stealing from motor vehicles	-0.019	0.046	42.14	4
45.11	Stealing from other vehicles	-0.019	0.038	42.14	4
40	Stealing in dwelling other than automatic meters	-0.02	0.042	41.83	4
47	Stealing from automatic machines and meters.	-0.02	0.038	41.83	4
53.02	Obtaining pecuniary advantage by deception	-0.02	0.087	41.83	4
53.2	Railway Frauds	-0.02	0.277	41.83	4
55.04		-0.021	0.13	41.52	4
81.3	Trespass with firearm in building (group II)	-0.021	0.13	41.52	4
81.37	Possess firearms person previously convicted (III)	-0.021	0.13	41.52	4
92.19	Production of a controlled drug: other class A	-0.021	0.13	41.52	4
93.3	Obstruct search for drugs	-0.021	0.083	41.52	4
137.99	Other Offs - cycles.	-0.021	0.13	41.52	4
53.15	Dishonestly destroying, defacing or concealing a document	-0.022	0.301	41.21	4

53.24	Evasion of liability by deception	-0.022	0.067	41.21	4
105.04	Assaulting a prison custody officer	-0.023	0.368	40.9	4
195.62	Contravention of airport authority by-laws	-0.023	0.229	40.9	4
93.19	Permit premises to be used other class A drugs	-0.024	0.051	40.59	4
33	Going equipped for stealing etc	-0.025	0.014	40.27	4
67.02	Perjury/false statements	-0.025	0.051	40.27	4
81.17	Possesion/distribution of weapon etc(I)	-0.025	0.278	40.27	4
5.11	Causing danger interfering with a vehicle etc	-0.026	0.269	39.96	4
8.28	Possession of offensive weapon school premises	-0.026	0.115	39.96	4
8.31	Breach of restraining order.	-0.027	0.074	39.65	4
93.21	Permit premises to be used for Cannabis	-0.027	0.028	39.65	4
8.11	Possess offensive weapons without lawful authority etc	-0.028	0.039	39.34	4
185.01	Being on enclosed premises for an unlawful purpose	-0.028	0.291	39.34	4
26	Bigamy	-0.029	0.1	39.03	4
55.01	Offences in relation to bankruptcy and Insolvency	-0.029	0.099	39.03	4
8.37	Racially aggravated harassment	-0.03	0.101	38.72	4
44	Stealing pedal cycles	-0.03	0.104	38.72	4
78.04	Non GB citizen obtains etc leave to enter or remain etc in UK	-0.03	0.547	38.72	4
53.35	Unauthorised modification of computer material (Computer Misuse Act)	-0.031	0.054	38.4	4
86.04	Supplying video recording of unclassified work	-0.031	0.116	38.4	4
104.23	Assault on a constable	-0.032	0.042	38.09	4
105.01	Common assault and battery	-0.032	0.009	38.09	4
126	Interfering with motor vehicles	-0.032	0.054	38.09	4
61.25	Pass etc. counterfeit notes/coins	-0.033	0.064	37.78	4
115.28	Loaded firearm public place	-0.033	0.078	37.78	4
8.27	Having blade in school	-0.034	0.045	37.47	4
92.51	Possession of Heroin	-0.035	0.023	37.16	4
86.05	Possessing video recording of unclassified work for supply	-0.036	0.151	36.85	4
99.43	Drunkenness in aircraft	-0.036	0.061	36.85	4
115.32	Trespass with firearm on land (I)	-0.036	0.259	36.85	4
137.18	Take cycle without consent	-0.036	0.111	36.85	4
8.22	In charge dog in non-public place and allowing it to injure.	-0.037	0.037	36.53	4

27	Man soliciting	-0.037	0.037	36.53	4
61.24	Make counterfeit notes/coins	-0.037	0.037	36.53	4
66.21	Act outrage public decency	-0.037	0.037	36.53	4
75.56	Restrictions on sale of maintenance of gaming machines	-0.037	0.037	36.53	4
86.03	Displaying indecent matter	-0.037	0.037	36.53	4
99.06	Personation	-0.037	0.037	36.53	4
99.87		-0.037	0.037	36.53	4
105.02	Assaults – Common	-0.037	0.037	36.53	4
115.22	False statement- firearms permit	-0.037	0.037	36.53	4
115.5	Sell firearm to under 17 (I)	-0.037	0.037	36.53	4
115.55	Supply air weapon to under 14 (III)	-0.037	0.037	36.53	4
115.6	False statement to obtain etc renewal of shotgun cert (II)	-0.037	0.037	36.53	4
115.88	Failing to report transaction authorised by a visitors shot	-0.037	0.037	36.53	4
118.01	Night poaching	-0.037	0.037	36.53	4
122.06	Pedestrian on motorway	-0.037	0.037	36.53	4
125.33	Disrupt lawful activity etc	-0.037	0.037	36.53	4
125.35	Fail to leave residential premises when required to do so	-0.037	0.037	36.53	4
191	Wireless telegraphy licences - sale/hire of tv sets	-0.037	0.037	36.53	4
193.46	Supply etc of articles for administering or preparing controlled drugs	-0.037	0.037	36.53	4
194.02	Non - patrial entering UK without leave	-0.037	0.037	36.53	4
195.21	Matters concerning Magistrates Courts	-0.037	0.078	36.53	4
195.56	APO Order failure to comply	-0.037	0.037	36.53	4
59.13	Possession with intent to commit criminal damage	-0.038	0.141	36.22	4
194.03	Non -patrial having only ltd leave in UK beyond time limit	-0.039	0.151	35.91	4
8.26	Have blade in public place	-0.04	0.08	35.6	4
46	Shoplifting	-0.04	0.016	35.6	4
89.07	Falsely describe food	-0.04	0.247	35.6	4
92.95		-0.04	0.247	35.6	4
93.28	Permit premises to be used other class C	-0.04	0.247	35.6	4
115.46	Under 14/have air weapon etc (III)	-0.04	0.041	35.6	4
149	Malicious damage	-0.04	0.028	35.6	4
164.11	Regulating traffic in Greater London	-0.04	0.247	35.6	4
194.16	Make false statements &c to immigration	-0.04	0.247	35.6	4
115.34	Trespass with firearm on land (III)	-0.041	0.042	35.29	4

87.02	Unlawful harassment of occupier (Protection from Eviction Ac	-0.042	0.882	34.98	4
92.5	Possession of Cocaine	-0.042	0.044	34.98	4
92.52	Possession of L S D	-0.042	0.116	34.98	4
139	Indecent exposure/insult female	-0.042	0.072	34.98	4
58	Other criminal damage (explosives)	-0.043	0.048	34.66	4
92.53	Possession of MDMA	-0.043	0.073	34.66	4
53.25	Making off without payment	-0.044	0.036	34.35	4
58.01	Racially aggravated other criminal damage	-0.044	0.055	34.35	4
130.02	Unauthorised take conveyance (not motor vehicle or cycle)	-0.044	0.065	34.35	4
195.91	Impersonation/police officer	-0.044	0.03	34.35	4
81.04	Possess shotgun no certificate	-0.045	0.03	34.04	4
84.03	False/misleading statements as to services	-0.045	0.095	34.04	4
92.55	Possession of Methadone	-0.045	0.053	34.04	4
92.59	Having possession: other class A	-0.045	0.052	34.04	4
112.01	Education Acts, 1944 -53	-0.045	0.131	34.04	4
115.47	Under 17/have air weapon etc (III)	-0.045	0.039	34.04	4
164.07	False alarms of fire	-0.045	0.026	34.04	4
8.36	Racially aggravated intentional harassment/alarm/distress	-0.046	0.055	33.73	4
122.07	Obstructions (Highways Act)	-0.046	0.049	33.73	4
123.02	Nuisances other than those caused by vehicles	-0.046	0.329	33.73	4
182	Begging, wandering etc	-0.046	0.217	33.73	4
92.35	Supplying etc Methadone	-0.048	0.045	33.11	3
143.62	Possession of alcohol at sporting event	-0.048	0.03	33.11	3
151.14	False representations social .security	-0.048	0.038	33.11	3
61.26	Possess counterfeit notes/coins	-0.049	0.049	32.79	3
66.03	Place etc bomb hoax	-0.049	0.062	32.79	3
92.69	Possession of unspecified controlled drug	-0.049	0.033	32.79	3
195.5	Refuse Disposal/Dumping	-0.049	0.074	32.79	3
53.32	Dishonestly obtain goods with false credit	-0.05	0.053	32.48	3
125.05	Break up public meeting	-0.05	0.266	32.48	3
125.11	Fear or provocation of violence	-0.051	0.027	32.17	3
43	Abstracting electricity	-0.052	0.057	31.86	3
53.33	Dishonest representation for obtaining benefit	-0.052	0.046	31.86	3
92.49	Supply etc drug Class unspecified	-0.053	0.152	31.55	3
111.19	Dog out of control – injury caused)	-0.053	0.551	31.55	3

66.99	Instruct in terrorism/invite another in weapon training	-0.054	0.059	31.23	3
108.21	Agriculture Cruelty to animals	-0.054	0.126	31.23	3
49.12	Stealing conveyance other than Motor Vehicle or cycle.	-0.056	0.276	30.61	3
92.6	Possession of Amphetamine	-0.057	0.038	30.3	3
92.61	Possession of Cannabis	-0.057	0.023	30.3	3
115.06	Non-comply Shot Gun Certificate	-0.057	0.036	30.3	3
92.68	Possession of other Class C drug	-0.058	0.075	29.99	3
141.12	Drunk in charge of under 7yr old	-0.058	0.058	29.99	3
195.26	Public Libraries and Museums Act Offences against L A bylaws	-0.058	0.115	29.99	3
55.02		-0.059	0.112	29.68	3
93.13	Permitting premises to be used MDMA	-0.059	0.079	29.68	3
93.2	Permitting premises to be used Amphetamine	-0.059	0.079	29.68	3
108.14	Abandonment of animals	-0.059	0.112	29.68	3
111.18	dog out of control – no injury caused	-0.059	0.121	29.68	3
164.12	Wilfully /indecently exposing the person	-0.059	0.031	29.68	3
195.59	Unauthorised access to computer material	-0.059	0.112	29.68	3
816.11	Speeding (motorways, caught by camera)	-0.059	0.112	29.68	3
803.07	Fail to give specimen for preliminary test	-0.061	0.092	29.05	3
105.03	Assault a person assisting a constable	-0.062	0.167	28.74	3
125.58	Racially-aggravated harassment, alarm or distress	-0.062	0.05	28.74	3
92.65	Possession of other class B drug	-0.063	0.041	28.43	3
108.02	Cruelty to Animals	-0.063	0.035	28.43	3
125.09	Intentional harassment causing alarm/distress	-0.063	0.06	28.43	3
131.01	Aggravated vehicle taking criminal damage	-0.064	0.141	28.12	3
195.79	Failure to comply/licence conditions following return to prison	-0.064	0.042	28.12	3
125.12	Cause harassment, alarm or distress	-0.065	0.032	27.81	3
803.09		-0.065	0.089	27.81	3
195.55	Reparation Order Failure to comply	-0.066	0.119	27.49	3
803.1		-0.066	0.089	27.49	3
8.21	In charge of a dog out of control	-0.067	0.096	27.18	3
195.53	Waste police employment	-0.068	0.079	26.87	3
84.08	Unauthorised use of	-0.069	0.069	26.56	3

	trademark.				
84.09	Falsification of Register etc (Copyright etc Act)	-0.069	0.077	26.56	3
99.3	Assist offender (triable either way)	-0.069	0.272	26.56	3
108.11	Cruelty to animals. Relating to disqualification	-0.069	0.272	26.56	3
825.03	Failure to give name &c after accident	-0.069	0.153	26.56	3
73.03	Failure to notify police of name (Sexual Offences)	-0.07	0.084	26.25	3
151.15	Job seekers Act (all offences)	-0.07	0.041	26.25	3
803.05	Drink/drug driving of mechanical propelled vehicle	-0.072	0.091	25.62	3
99.99	Other Indictable Offences	-0.073	0.04	25.31	3
125.29	Go on play area etc (football)	-0.073	0.036	25.31	3
140.01	Being found drunk in a highway / public (not a building)	-0.073	0.043	25.31	3
140.06	Drunk etc at sports events	-0.073	0.034	25.31	3
141.01	Drunk and disorderly (public place)	-0.073	0.052	25.31	3
195.94	Offence of harassment	-0.073	0.041	25.31	3
803.02	Drink/drugs Driving etc	-0.073	0.059	25.31	3
104.33	Resist or obstruct PC/assault	-0.074	0.039	25	3
52	False accounting	-0.077	0.157	24.07	3
141.02	Drunk in charge horse etc	-0.077	0.04	24.07	3
168.91	EP 1990	-0.077	0.127	24.07	3
195.46	Relating to prisons and other institutions for offenders	-0.077	0.04	24.07	3
802	Dangerous driving	-0.077	0.046	24.07	3
55.05		-0.078	0.086	23.75	3
123.05	Cause danger etc (Highways Act)	-0.078	0.057	23.75	3
145.01	Trade Unions etc Act 1992 - intimidation	-0.078	0.057	23.75	3
813	Vehicle Test Offences	-0.078	0.047	23.75	3
73.04	Failure to notify address(Sexual Offences)	-0.079	0.064	23.44	3
162.03	Town Police Clauses Act 1847 other offences (against Police	-0.08	0.042	23.13	3
803.03	Drive &c not provide police with specimen	-0.08	0.049	23.13	3
814.02	Deceive/forge (insurance)	-0.08	0.045	23.13	3
81.36	Possession of firearms by person previous convicted (II)	-0.081	1.018	22.82	3
803.11		-0.081	0.074	22.82	3
99.84		-0.082	0.089	22.51	3
115.04	Non-comply firearm certificate not aggravated	-0.082	0.044	22.51	3
195.63	Violence Criminal .Law Act securing entry	-0.082	0.078	22.51	3

83.01	Abscond etc bail	-0.083	0.05	22.2	3
195.08	Failure to stop when required to do so	-0.083	0.056	22.2	3
814.01	deceive/forge driving licence	-0.083	0.051	22.2	3
164.03	Obstruction in streets	-0.084	0.049	21.88	3
165.01	Kerb – crawling	-0.084	0.106	21.88	3
195.41		-0.084	0.049	21.88	3
119.01	Day poaching	-0.085	0.064	21.57	3
165.02	Persistent soliciting of women for prostitution	-0.085	0.047	21.57	3
173.2	Touting for hire car services in a public place	-0.086	0.132	21.26	3
814.03	Registration and licensing forgery deception	-0.086	0.042	21.26	3
143.01	Selling intoxicating Liquor without licence	-0.088	0.048	20.64	3
814.04	Work records falsification (vehicles)	-0.088	0.061	20.64	3
166.04	Common prostitute loitering or soliciting	-0.091	0.055	19.7	3
804.9	Racing on highway	-0.091	0.086	19.7	3
803.06	Fail to give specimen/driving mechanically propelled vehicle	-0.093	0.08	19.08	3
805.02	Fail to report accident within 24 hrs	-0.094	0.167	18.77	3
91.15	Deposit &c controlled waste	-0.096	0.057	18.14	3
36.02	Hijacking/endangering life etc	-0.097	0.061	17.83	3
81.26	Carrying loaded firearm in public (I)	-0.097	0.061	17.83	3
92.13	Production of MDMA	-0.097	0.061	17.83	3
93.15	Permit premises to be used: Methadone	-0.097	0.061	17.83	3
99.85		-0.097	0.061	17.83	3
104.31	Resist or obstruct PC assault	-0.097	0.061	17.83	3
115.95	Failure to give notice in writing of transfers (shotguns) to	-0.097	0.061	17.83	3
116.06	Salmon and Freshwater Fisheries Act 1975 Bylaws	-0.097	0.061	17.83	3
116.11	Take/destroy fish in private	-0.097	0.061	17.83	3
121.11	Offence against deer	-0.097	0.061	17.83	3
125.28	Take part/racialist or indecent (football)	-0.097	0.061	17.83	3
125.3	Entering premises in breach of domestic football banning order	-0.097	0.061	17.83	3
141.03	Drunk/possess loaded firearms	-0.097	0.061	17.83	3
147.01	Begging (Children's Act)	-0.097	0.061	17.83	3
804.01	Careless driving - without due care and attention	-0.097	0.061	17.83	3
810.9	Drive with excess passengers (trade)	-0.097	0.061	17.83	3
818.9	Neglect traffic directions.	-0.097	0.061	17.83	3

	other (Road Traffic Act)				
188.05	Collecting alms/endeavouring to procure charitable contributions	-0.101	0.057	16.59	3
805.01	Fail to stop after accident	-0.102	0.063	16.27	3
194.18	Possess false passport etc	-0.105	0.071	15.34	3
137.07	Pedal cycles - riding on footpath	-0.108	0.207	14.4	3
803.12		-0.111	0.07	13.47	3
807.04	Drive after false declaration as to fitness etc	-0.112	0.083	13.16	3
815.9	Vehicles in dangerous/defective condition (Other offences, Road Traffic Act)	-0.116	0.073	11.91	2
816.01	Speeding (motorways)	-0.119	0.075	10.97	2
809.9	Failure to supply police with particulars	-0.121	0.067	10.35	2
815.03	Tyres defective Road Traffic Act	-0.122	0.081	10.04	2
91.17	Handle &c controlled waste w/out reasonable measures	-0.124	0.079	9.42	2
121.06	Laying poison to destroy or injure game	-0.124	0.079	9.42	2
170	Keep motor vehicle with no licence	-0.124	0.079	9.42	2
811.01	Installation/recording equipment. Failing to keep proper records	-0.124	0.079	9.42	2
807.9	Other driving licence offences	-0.125	0.101	9.1	2
825.06		-0.125	0.082	9.1	2
809.01	Uninsured motor vehicle uninsured	-0.126	0.099	8.79	2
817	Motorway offences (other than speeding)	-0.127	0.088	8.48	2
815.04	Loading offences (Road Traffic Act)	-0.128	0.086	8.17	2
820.9	Wilful/unnecessary obstruction (Highways Act)	-0.128	0.082	8.17	2
825.02	Unlawful pillion riding (Road Traffic Act)	-0.128	0.077	8.17	2
169.2	Throwing stones (Transport Act)	-0.129	0.083	7.86	2
807.01	Drive whilst disqualified etc	-0.129	0.083	7.86	2
195.67	Failure of young offender to comply with supervision requirement	-0.133	0.085	6.61	2
823.01	Dangerous load/number of persons carried (Road Traffic Act)	-0.133	0.084	6.61	2
812	Operators licence offences	-0.136	0.1	5.68	2
824.01	Motor Cycle/not wearing protective helmets (Road Traffic Act)	-0.139	0.09	4.74	2
815.01	Defective brakes (Road Traffic Act)	-0.144	0.093	3.18	1
89.05	Selling food not complying	-0.145	0.095	2.87	1

	with food safety				
84.02	False/misleading indications as to price of goods	-0.151	0.099	1	0
108.17	Animals (Cruel Poisons)	-0.151	0.099	1	0
137.13	Ride cycle drunk etc	-0.151	0.099	1	0
143.16	Person under 18 buy &c alcohol	-0.151	0.099	1	0
168.3	Misuse of Fire Hydrant, damaging	-0.151	0.099	1	0
168.82	EP 1990	-0.151	0.099	1	0
807.02	Drive &c contrary to conditions of licence	-0.151	0.099	1	0
811.02	Fail to observe limits on hours of driving etc	-0.151	0.099	1	0
814.06	Vehicle test certificate (fraudulently using etc)	-0.151	0.099	1	0
819.01	Neglect of pedestrian rights	-0.151	0.099	1	0
821	Lighting offences (Road Traffic Act)	-0.151	0.099	1	0
822	Noise offences (Road Traffic Act)	-0.151	0.099	1	0
92.02	Offences in relation to exportation of controlled drugs	.	0.316	.	.
825.9	Miscellaneous offences Road Traffic Act	.		.	.

Appendix C Severity scores for disposals

Disposal type	Score	Standard error	Score A	Score B
Absolute discharge	0.0848	0.047	13.24	2.58
Action plan order	-0.0022	0.0186	46.19	3.83
Action plan order + Reparation Order	0.0027	0.0304	44.35	3.79
Action plan order + other	0.0454	0.0203	28.18	3.34
Attendance centre order	0.0093	0.0132	41.84	3.73
Attendance centre order +	-0.0051	0.0292	47.32	3.86
Attendance centre order + Action plan order	-0.0165	0.0350	51.64	3.94
Bound over	0.0430	0.0162	29.09	3.37
Compensation order	0.0259	0.0044	35.56	3.57
Conditional discharge up to 6 months	0.0549	0.0186	24.58	3.20
Conditional discharge 6 months - 1 year	0.0461	0.0124	27.92	3.33
Conditional discharge over 1 year+	0.0329	0.0046	32.91	3.49
Conditional discharge less than 6months + fine	0.0926	0.0814	10.28	2.33
Conditional discharge over 6 months + fine	0.0612	0.0290	22.17	3.10
Confiscation order	0.1087	0.0663	4.20	1.44
Community punishment <1 year	0.0096	0.0108	41.75	3.73
Community punishment <1 year + fine	0.0224	0.0125	36.87	3.61
Community punishment 1 year or more	0.0036	0.0132	44.00	3.78
Community punishment 1 year or more + fine	0.0328	0.0378	32.94	3.49
Community Service Order revoked	0.0210	0.0045	37.42	3.62
Curfew order/tag less than three months	0.0127	0.0190	40.56	3.70
Curfew order/tag three or more months	-0.0154	0.0477	51.21	3.94
Cautions/Warnings/Reprimands	0.0306	0.0031	33.79	3.52
Detained under powers of Courts	0.0464	0.0244	27.78	3.32
Detention and training order up to 4 months	-0.0290	0.0373	56.37	4.03
Detention and training order 5+ months	-0.2277	0.1549	131.65	4.88
Drug Treatment and Testing Order	0.0106	0.0134	41.37	3.72
extend licence - s/v	0.0414	0.0332	29.68	3.39
Fine	0.0777	0.0375	15.95	2.77
Guardianship order	-0.0981	0.1276	82.56	4.41
Hospital order	-0.6501	0.4244	291.71	5.68

Local Authority to pay fine	*0.0382*	*0.0092*	*30.88*	*3.43*
Not separately dealt with	*0.1171*	*0.0727*	*1.00*	*0.00*
Otherwise dealt with	*0.0609*	*0.0261*	*22.32*	*3.11*
Parents to pay fine	*0.0351*	*0.0224*	*32.08*	*3.47*
Prison up to 1 month	*0.0555*	*0.0201*	*24.36*	*3.19*
Prison 1+ - 3 months	*0.0194*	*0.0067*	*38.01*	*3.64*
Prison 3+ - 6 months	*-0.0177*	*0.0303*	*52.09*	*3.95*
Prison 6+ 1 year	*-0.1960*	*0.1330*	*119.62*	*4.78*
Prison 1+ - 2 years	*-0.3847*	*0.2427*	*191.14*	*5.25*
Prison 2+ - 3 years	*-0.6632*	*0.3713*	*296.65*	*5.69*
Prison 3+ - 4 years	*-0.8203*	*0.4652*	*356.19*	*5.88*
Prison 4+ - 6 years	*-1.4397*	*0.7489*	*590.88*	*6.38*
Prison 6+ - 10 years	*-4.0582*	*1.8550*	*1583.05*	*7.37*
Prison 10+ - 17 years	*-6.1765*	*3.5557*	*2385.68*	*7.78*
Prison life	*-52.6636*	*4.6787*	*20000.00*	*9.90*
Refer to Youth Offending Panel	*-0.0080*	*0.0241*	*48.42*	*3.88*
Reparation order	*0.0304*	*0.0045*	*33.85*	*3.52*
Reparation order +	*-0.0421*	*0.0555*	*61.33*	*4.12*
Reparation Order + Attendance Centre Order	*-0.0334*	*0.0584*	*58.04*	*4.06*
Restriction order	*0.0566*	*0.0441*	*23.94*	*3.18*
Suspended prison sentence	*0.0936*	*0.0644*	*9.90*	*2.29*
Tag <3 months + Community Punishment <1yr	*0.0012*	*0.0252*	*44.91*	*3.80*
Tag <3 months + Community Punishment 1yr+	*0.0092*	*0.0236*	*41.88*	*3.73*
Tag 3 months+ + Community Punishment <1yr	*-0.0619*	*0.0762*	*68.82*	*4.23*
Tag 3 months + + Community Punishment 1yr+	*-0.0234*	*0.0408*	*54.25*	*3.99*
Tag 3 months + + fine	*0.0854*	*0.0618*	*13.00*	*2.57*
Young Offenders Institute 1 day	*0.0799*	*0.0397*	*15.08*	*2.71*
Young Offenders Institute 5-21 days	*0.0570*	*0.0235*	*23.78*	*3.17*
Young Offenders Institute 26-31 days	*0.0527*	*0.0185*	*25.42*	*3.24*
Young Offenders Institute >1 -2 months	*0.0241*	*0.0052*	*36.26*	*3.59*
Young Offenders Institute > 2 - 3months	*0.0100*	*0.0139*	*41.59*	*3.73*
Young Offenders Institute >3 - 4 months	*-0.0175*	*0.0315*	*52.01*	*3.95*
Young Offenders Institute > 4 - 6months	*-0.0581*	*0.0576*	*67.40*	*4.21*
Young Offenders Institute > 6 - 9months	*-0.2253*	*0.1623*	*130.73*	*4.87*
Young Offenders Institute > 9 months - 1year	*-0.5529*	*0.2978*	*254.89*	*5.54*
Young Offenders Institute >1 - 2 years	*-0.5136*	*0.3255*	*239.99*	*5.48*
Young Offenders Institute >2 - 3 years	*-0.9195*	*0.5460*	*393.78*	*5.98*
Young Offenders Institute >3 years	*-1.9518*	*1.0163*	*784.93*	*6.67*

Appendix D. Offence seriousness scores from Paired comparison approach based on historical data.

Top ten and bottom two offences using "broad" offence codes.

Home Office code and offence name	Seriousness worths	Scaled seriousness worths
1+2 Murder, attempted murder	0.656429	20000
16 Buggery and attempted buggery	0.234819	13528
23 Rape	0.020797	10772
5 Wounding & other acts endangering life	0.014067	9448
19 Indecent assault on a male	0.011201	8764
4 Manslaughter	0.009824	5210
3 Threats,conspiracy or incitement to murder	0.009113	5066
27 Robbery and assaults with intent to rob	0.005417	4878
29 Aggravated burglary in a dwelling	0.005269	2354
28 Burglary in a dwelling	0.005073	1814

818 Neglect of traffic directions	0.000000668	1
821 Lighting offences	0.000000197	1

Scaled seriousness worths are scaled with two anchor points – Murder and attempted murder at 20000, and the least serious offence at 1.

Appendix E Additional information relating to the coding of disposals.

E1. Single disposals

We considered the possibility of excluding some disposals on the basis that they were not considered punitive; these included the disposals of 'bind over', or confiscation orders. It could be argued that as such disposals are not punitive they should not be included in analysis that attempts to identify the level of this dimension. However, if indeed such disposals do not contain a measure of punitiveness then the severity score produced by the correspondence analysis will be low. So subsequently the correspondence analysis included all primary disposals.

We also considered the issue of community disposals. The following community disposals appear to be very similar in nature:

- Community Punishments (formerly Community Service Orders)
- Community Rehabilitation Orders,
- Community Punishment and Rehabilitation Orders

For example a Community Punishment Order is described by the National Probation Service (Suffolk) in the following way,

"Community punishment is a means by which offenders can be punished by undertaking positive and demanding unpaid work. At the same time, they can begin to make amends for what they have done and put something back into the community. Community punishment orders are used for many types of offence and take many forms, from scrub clearance and environmental improvement to work with disabled children."

In addition,

"Community punishment can offer a chance to see some positive models of behaviour and be in contact with a mix of paid staff, voluntary and charity workers"

Although Community Rehabilitation Orders do not necessarily require the element of work involved in Community Punishment Orders they are similar in their aims to reduce offending and promote positive behaviour. According to the Doncaster Metropolitan Borough Council,

"A Community Rehabilitation Order is a sentence imposed by the Courts to help reduce the likelihood of re-offending as well as dealing with personal problems such as accommodation and employment. The aims of a Community Rehabilitation Order are to:

- Protect the public from harm
- Encourage and assist you to a law abiding life, thereby promoting your welfare
- Prevent you from committing further offences
- Allow you to give reparation to (in other words make amends to) the victim of your crime"

Finally, Community Punishment and Rehabilitation Orders are a combination of the two disposals described above.

Given that these disposals are very similar in nature and the fact that they are also very similar in terms of the severity scores that correspondence analysis produced when they were entered as separate disposals we decided to create a new disposal labelled 'Community Punishment' that groups all of these disposals. This disposal was categorised into two levels:

- Community Punishment < 1 year.
- Community Punishment 1 year or more

All other possible disposals are listed below:

Detained under Powers of Criminal Courts
Custody for life (of offenders aged 18 and under 21)
Mandatory life sentences for second serious offence
Prison (up to 1 month)
Prison (1 mnth+ - 3 mnths)
Prison (3 mnths+ - 6 mnths)
Prison (6 mnths + -1 yr)
Prison (1 yr + - 2 yrs)
Prison (2 yrs+ - 3 yrs)
Prison (3 yrs+ - 4 yrs)
Prison (4 yrs+ -6 yrs)
Prison (6 yrs+ - 10 yrs)
Prison (10 yrs+ (but not life))
Prison (life)
Extend licence where sexual or violent offences (up to 6 mthns)
Extend licence where sexual or violent offences (6 mnths+)
Min 7yrs sentence for 3rd class A drugs offence + 3 yrs for 3rd dom burgl
Imprisonment without option of fine (non-effective)
Intermittent Custody Order - concurrent
Detained under Powers of Criminal Courts Act 2000
Restriction order
Suspended sentence 1 year
Young Offenders Institute (effective) (1 day)
Young Offenders Institute (effective) (2+ days - 3 wks)
Young Offenders Institute (effective) (3+ wks - 1 mnth)
Young Offenders Institute (effective) (1+ mnth - 2 mnths)
Young Offenders Institute (effective) (2+ mnths - 3 mnths)
Young Offenders Institute (effective) (3+ mnths - 4 mnths)
Young Offenders Institute (effective) (4+ mnths - 6 mnths)

Young Offenders Institute (effective) (6+ mnths - 9 mnths)
Young Offenders Institute (effective) (9+ mnths - 1 yr)
Young Offenders Institute (effective) (1+ yr - 2 yrs)
Young Offenders Institute (effective) (2+ yrs - 3 yrs)
Young Offenders Institute (effective) (3+ yrs)
Young Offenders Institute (non-effective)
Secure Training Order
Detention and Training Order (consecutive) (up to 4 mnths)
Detention and Training Order (consecutive) (4+ mnths)
Detention and Training Order (concurrent)
Intermittent Custody Order
Police cells 1 day
Community Punishment (< 1 year)
Community Punishment (1+ year)
Curfew/exclusion order with electronic monitoring (< 3 mnths)
Curfew/exclusion order with electronic monitoring (3+ mnths)
Curfew/exclusion order without electronic monitoring
Attendance centre
Reparation order
Action plan order
Drug Abstinence Order
Drug treatment and testing order (< 1 yr)
Drug treatment and testing order (1+ yr)
Supervision order
Refer to a youth offender panel
Revocation Of Referral Order
Disqualification Order-Adults
Disqualification Order-Juveniles
Fine
Anti-social behaviour order (on conviction)
Conditional discharge (< 6 mnths)
Conditional discharge (6 mnths - 1 yr)
Conditional discharge (1+ yr)
Anti-social behaviour order (on conditional discharge)
Pre-Sentence Drug Testing Order
Bound over at Crown Court/conviction
Football Banning Order
One day in Crown Court cells
Travel Restriction Order
Absolute Discharge
Committed to Crown Court for sentence
Hospital order
Guardianship order under care of local social services authority
Hospital & Limitations Order
Recommended for deportation
Compensation Order
Local authority to pay fine, compensation or costs
Parents to pay fine or compensation or costs
Parenting Order
Parents bound over

Restitution
Confiscation order
Order for forfeiture of property/vehicle
Not separately dealt with
Suspended sentence of imprisonment, variation of duration
Restraining Order
Restraining Order-Sex Offenders
Disqualification from driving
Disqualification from driving where vehicle is used for purposes of crime
Community Service Order revoked by court
Otherwise dealt with on conviction

E2. Multiple Disposals

The matter of multiple disposals given for the same conviction, and how to deal with these disposals, needs careful thought. A number of convictions in the dataset received more than one disposal. For example, a conviction for theft may be punished with a fine. The fine (referred to as 'disposal 1' on the PNC) may be accompanied by, say, a Community Punishment. By producing a simple cross tabulation it was possible to analyse the additional disposals ('disposal 2', 'disposal 3', and 'disposal 4') that accompany the disposals listed under the 'disposal 1' variable. On the whole these additional disposals do not appear to complicate matters too much.

In summary, offences that have three or four disposals are comparatively rare and we do not feel including these disposals will add additional value to the analysis, but cases in which two disposals ('disposal 1' and 'disposal 2') have been given are more frequent. The majority of these 'second' disposals are compensation/confiscation orders. The most likely 'first' disposals to be accompanied by a 'second' disposal are community punishments or fines. In other words, the less serious the 'first' disposal, the more likely it is that this disposal will be accompanied by a 'second' [7] disposal.

However, we have identified a distinction between 'second' disposals that do not add anything additional to the 'first' disposal (they are *complementary* to the 'first' disposal), and those that do add an extra element of punitiveness to the 'first' disposal (they are *additive disposals*). For example, where the 'second' disposal is 'Local Authority to pay fine' and the 'first' disposal is a fine, the 'second' disposal is complementary to the fine. Even if the former disposal was understood to be punitive, the added value would be marginal. 'Second' disposals such as these 'round off' the punishment. In the same way, those 'second' disposals that are compensation/confiscation orders are complementary to the 'first' disposal. They are not viewed as punishment in the same way as fines.

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[7] The fact that a disposal is listed as 'disposal 1' (or the 'first' disposal) does not necessarily mean that it is the principal disposal. But the majority of 'first' disposals are more severe than the 'second' disposals. In some instances this is not the case. However the SPSS syntax ensures that the more severe disposal is always included in the analysis.

But there are some 'second' disposals that enhance the punishment in a supplementary or additive way. They increase the severity when considered alongside the 'first' disposal. Of the 'second' disposals in our dataset it is community punishments that offer this extra element. In order to deal with this we created the following new disposal codes that combine these multiple disposals. Firstly, though, it must be made clear that the name of the columns in the table should not be taken to indicate the order in which the disposals are given. The order in which these disposals are given is not important. So if a fine and a Community Punishment of less then one year are given it does not matter if the fine is the principal disposal or if the Community Punishment is the principal disposal, the combination will always result in 'Community Punishment < 1 year +'

Table E1: Disposals categories created from multiple disposals

Disposal	Additional disposal	Notes
Community Punishment	*Community Punishment*	In cases where the first and second disposals were Community Punishment the total number of days of Community Punishment were calculated. This was then recoded into the two categories listed above for this disposal.
Community Punishment < 1 year	*Fine*	
Community Punishment 1 year +	*Fine*	
Curfew/Tag <3months	*Community Punishment < 1year*	
Curfew/Tag <3months	*Community Punishment 1year +*	
Curfew/Tag 3months+	*Community Punishment < 1year*	
Curfew/Tag 3months +	*Community Punishment 1year +*	
Curfew/Tag <3 months	*Fine*	
Curfew/Tag 3 months +	*Fine*	
Attendance Centre Order	*Community Punishment/fine*	These disposals are often accompanied by a fine or a Community Punishment. For the sake of parsimony it was decided that a disposal be created in which either of these disposals accompanied these Orders. The names of these combines disposals are *Action Plan Order plus, Reparation Order plus* etc
Action Plan Order	*Community Punishment/fine*	
Reparation Order	*Community Punishment/fine*	
Attendance Centre Order	*Action Plan Order*	
Attendance Centre Order	*Reparation Order*	
Action Plan Order	*Reparation Order*	
Conditional Discharge <6 months	*Fine*	
Conditional Discharge 6 months + <1 year	*Fine*	
Conditional Discharge 1 year +	*Fine*	

Finally, it is important to make clear why some of these disposals are classed as distinct from other disposals, and not grouped together in the way that the Community Punishments are. Specifically, Action Plan Orders, Attendance Centre Orders, and Reparation Orders require discussion.

Attendance Centre Orders are orders that require young offenders to attend Attendance Centres. They provide a range of activities centred mainly around teaching job and social skills These centres are normally run by the Police. Attendance Centre Orders are different to the Community Punishments insofar as they require no reparation on behalf of the offender.

Action Plan Orders are multi-faceted community orders. Like all other orders described so far they are designed to change the offenders' behaviour. However, Action Plan Orders are individually designed to the needs of the offenders. Owing to the unique nature of each Action Plan Order it was decided to code these orders as separate from the other community orders.

Reparation Orders. According to the Home Office

> The Reparation Order has a twofold aim:
> - to take into account the feelings and wishes of the victims of crime;
> - to prevent the young offender from committing further offences by confronting him with the consequences of his criminal behaviour, and allowing him to make some amends.

Unlike the other community disposals discussed so far, the Reparation Order places an emphasis on repairing the harm done to the victim.

For information, the overall additive effect that incorporating these second disposals has on the seriousness scores is minimal. However, we do recognise that second disposals will affect the seriousness scores.