

Technical Appendix:

Plotting Sentence Severity and Crime Seriousness

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Overview:

The Sentencing Academy's submission to the Sentencing Review reported new analyses of sentencing trends in England and Wales. These analyses drew upon a new approach to examining trends in the use of imprisonment. This technical appendix describes the analytical procedures followed to plot the trends of sentence severity and crime seriousness reported in the Sentencing Academy's 'Response to Independent Sentencing Review Call for Evidence'. The code and data necessary to reproduce those figures are available in [this repository](#).

Previous publications by the Sentencing Academy (Pina-Sánchez et al., 2023) and others documented the rise in the use of imprisonment and hence the size of the prison population. In that research we constructed an **Imprisonment Index** which captures the use of imprisonment by measuring both custody rates and sentence lengths. The new analyses reported in the Sentencing Academy's response explored the relationship between changes in crime seriousness and the use of imprisonment. Specifically, we explored a key possible explanation for sentence inflation, namely, whether it has been driven by a change in the seriousness of cases appearing for sentencing. This analysis requires measures of crime seriousness and sentence severity.

Sentence severity is straightforwardly measured by the Imprisonment Index, which as noted captures both dimensions of the probability of imprisonment and the duration of custody. Crime seriousness is more complex to measure. Ideally, a case-by-case analysis would be conducted with a multidimensional measure of seriousness capturing the harm caused or threatened. An alternate approach involves measuring the mix of crimes appearing for sentencing. This may be seen as comparing two baskets of mixed fruits in order to determine the level of price inflation for this category of produce. If a basket of fruit cost 50% more in 2024 than 2004, this would constitute raw price inflation. The question tested would be whether the basket contained a higher proportion of expensive fruits in 2024: more kiwis, fewer apples. With respect to sentencing the seriousness analysis poses an analogous question: are the crimes sentenced in 2024 any more or less serious than those sentenced in 2004? If, for example, there was a higher percentage of serious crimes in 2024, this would explain the greater use of imprisonment as captured by the Imprisonment Index.

Our analytical strategy involved contrasting trends in sentence severity with trends in crime seriousness in England and Wales from 2004 to December 2024. The datasets we used were manually derived from the underlying data made available in two criminal justice statistics reports from the Ministry of Justice (MoJ). For the period covering 2010 to 2024 we used data from '[Criminal Justice Statistics quarterly: June 2024](#)', and from 2004 to 2009 we used data from '[Criminal justice statistics quarterly: December 2014](#)'. We could not go further back in time as previous MoJ reports did not disaggregate sentence outcomes by offence type consistently.

To estimate differences in sentence severity across offence types and time we multiplied the custody rate observed for each offence type by their average custodial sentence length. This is the imprisonment index. It can be expressed mathematically as: $S_{i,t} = C_{i,t} \cdot L_{i,t}$, with S referring to sentence severity, C to custody rate, L to average sentence length, with subindexes i and t used to distinguish across offence types and years, respectively.

In a previous Sentencing Academy research bulletin (Pina-Sánchez et al., 2023) we used this and other indexes of sentence severity to quantify the process of sentence inflation experienced in England and Wales over the past couple of decades. Subsequent analyses from [Pina-Sánchez](#) and [Tom Calver from The Sunday Times](#), documented how the process of sentence inflation varied markedly across offence types. Sentence inflation is not uniform across all offences. Instead, inflation is very marked for some crimes, more modest for others, and absent for some offences. This simple finding is important because it suggests that there is no *single* cause of sentence inflation – for example a general shift in punitiveness by courts over the period in question. Instead, sentence inflation is likely multiply determined. Multiple interrelated causes are leading to different processes of sentence inflation. For example, it has been hypothesised that legislative changes such as the introduction of statutory starting points for murder, sentencing guidelines (Allen, 2016; Isaac, 2021; Pina-Sánchez et al., 2023), public pressure (Roberts et al., 2022), could all have contributed in different ways to the process of sentence inflation.

To estimate the level of crime seriousness for each offence category and year we used the [ONS Crime Severity Score](#) (CSS). At the core of the crime severity score is a weighting system, based on sentencing data, designed to reflect the seriousness of each crime type. Further details regarding the composition of the seriousness scale can be found in Bangs (2016).

Thus, both our measure of crime seriousness (or what ONS refers to as 'severity') includes a component of sentence data. However, any 'circularity bias' is avoided by the fact that the estimation of weights for the ONS crime seriousness score relies on *cross-sectional* data, namely average sentence outcomes in England and Wales from 2011 to 2015. This means that we only use one weight for each specific offence type, rather than updating the weights across the window of observation of our analysis. In other words, changes across time of the seriousness and severity measures are independent of each other.

The weighting process starts with the average custodial sentence length imposed for each offence type, or, where custodial sentences are not common, the typical fine amount. These values are used as proxies for the harm caused by a particular crime, under the rationale that sentencing reflects the societal impact and legal seriousness of the offence.

Specifically, to calculate the weights, the seriousness scale draws on the England and Wales sentencing guidelines, actual sentencing outcomes from court data, and subjective expert judgements. For crimes resulting in prison sentences, the length of the sentence (measured in months) forms the basis of the weight. For crimes leading to financial penalties, the size of the fine is converted into an equivalent harm measure. Crimes that rarely result in prosecution or sentencing are assigned weights based on expert judgment or analogous offences. The resulting weights are standardised to create a consistent scale, ensuring that crimes of greater harm (e.g., homicide or grievous bodily harm) have higher values than less severe offences (e.g., shoplifting or graffiti). A more detailed example of how crime severity weights are calculated for the case of shoplifting can be found [here](#), and the full list of crime severity scores for each offence type [here](#).

By focusing on the seriousness of crimes rather than simply their frequency, the CSS helps to highlight areas or types of crime that may require greater attention or intervention. The ONS and other crime seriousness indexes proposed in the literature (Sherman et al., 2016) also permit comparisons between regions and time periods that account for changes in the mix of crime types. For example, an area experiencing fewer but more severe crimes may register a higher CSS, guiding authorities to prioritise appropriate responses.

Findings for Three Offence Categories

Given the short deadline allowed for responses to the Sentencing Review, we only contrasted trends of sentence severity to crime seriousness for three offence categories: criminal damage and arson, drugs and sexual offences. This selection includes the offence category that has experienced the strongest sentence inflation (criminal damage and arson) and two other offence categories that have been subject to different legislative changes (drugs and sexual offences).

Specifically, to estimate the changing levels of crime seriousness for an offence category across time, which we denote as $H_{i,t}$, we use an arithmetic mean for each of the three offence categories under study, so: $H_{i,t} = \frac{\sum(X_i \cdot n_{i,t})}{N_t}$, where X_i refers to the severity score allocated to a specific offence type, $n_{i,t}$ denotes the number of sentences imposed of the specific offence type (e.g. indecent assault) within a year, and N_t the number of offences sentenced within the broader category under analysis (e.g. sexual offences) in a year. Since offence types were not always consistently categorised across the two MoJ reports and the ONS CSS, we selected only offence types that were unequivocally labelled equally across those three datasets, and recoded into broader categories some of the offence types more granularly defined, so they could be compared.

For drug offences we used the following weights and offence categorisations: i) *92A.trafficking*, with a crime severity score of 667; ii) *92B.possession*, with a crime severity score of 5; and iii) *92C.other*, with 12.

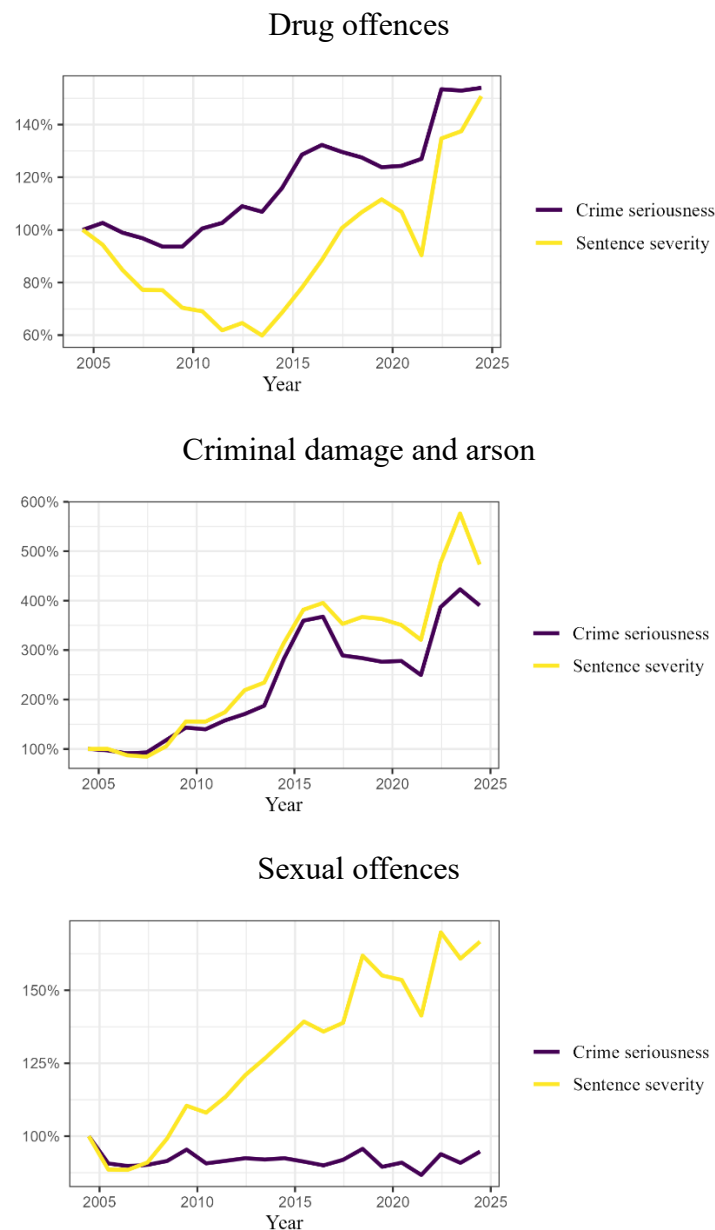
The analysis of criminal damage and arson offences was based on the following weights and offence categorisations: i) *56A.arson endangering life*, weighted as 902; ii) *56B.arson not endangering life*, with a weight of 200; iii) *58E-J.racially or religiously aggravated criminal damage*, with 13; and iv) *58D.other criminal damage*, with a weight of 9.

Lastly, for sexual offences (which includes some historic cases for offences since repealed and replaced) we used: i) *19A-K.rape*, weighted at 3285; ii) *17A-B & 20A-B.sexual assault*, with

673; iii) 21-22.sexual activity involving a child, with 845; iv) 16.buggery, weighted at 3656; v) 23.incest or familial sexual offences, with 1308; vi) 71.abuse of children through sexual exploitation, with 959; vii) 73.abuse of position of trust of a sexual nature, with 246; viii) 74.gross indecency with a child, with 819; and ix) 88E.exposure and voyeurism, with 47.

The results of our sentence severity and crime seriousness comparisons for drugs, criminal damage, and sexual offences are reproduced in Figure 1, below, and discussed in more detail in our response to the sentencing review.

Figure 1 Trends in Sentence Severity and Crime Seriousness (2004 as baseline)



Visual examination of the three figures demonstrates that changes in the mix of offences appearing for sentence explains much of the sentence inflation for drug offences as well as criminal damage and arson. However, changes in the seriousness of sexual offences cannot explain sentence inflation for this category of offending. The explanation for the increased use of imprisonment for sexual offenders must lie elsewhere.

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