Measuring Offence Seriousness

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Aim: To present and assess two new measures of offence seriousness in NSW.

Method: The first measure of offence seriousness, Median Sentence Ranking (MSR), was constructed by identifying the median sentence actually imposed in each Australian Standard Offence Classification (ASOC) group. The data used for this purpose consisted of cases finalised in the NSW Children's, Local, District and Supreme Courts between 3 April 2000 and 31 March 2005 where the offender had no prior criminal record. The second measure, Median Statutory Maximum Ranking (MSMR), was constructed by reference to the median statutory maximum penalty applicable among offences in each ASOC group. Logistic regression was used to compare the MSR and the MSMR to the current National Offence Index (NOI) in terms of (a) their ability to predict who will be sentenced to imprisonment, and (b) their ability to identify the principal offence, that is, the offence that incurred the most severe penalty.

Results: The MSR proved superior to both the NOI and MSMR both in its ability to predict a sentence of imprisonment and to predict the principal offence. The MSMR proved superior to the NOI in its ability to predict a sentence of imprisonment, however, the NOI proved superior to the MSMR in predicting the principal offence.

Conclusion: The MSR is the better choice when the aim is either to investigate or control for the influence of offence seriousness on the likelihood of imprisonment or to identify which of two offences will incur the more severe sentence. The NOI is a relatively robust measure of seriousness which may make it useful when alternative measures are not available or cannot be derived or when the aim is to predict outcomes outside the criminal justice system where public opinion is a salient factor.

INTRODUCTION

Measures of offence seriousness can be used for a variety of research purposes, including as:

1. a dependent variable in studies investigating changes in, or public perceptions of, offence seriousness;

2. an independent variable in research exploring the relationship between offence seriousness and various criminal justice outcomes (e.g. bail decisions);

3. a control variable for investigations examining the independent impact of other variables (e.g. age or gender) on criminal justice outcomes (e.g. sentencing);

4. a basis for selecting the principal offence in cases with several charges where no charge was proven (Australian Bureau of Statistics, 2010);

5. a basis for selecting the principal offence in sentencing cases with multiple offences where identical penalties were imposed; and

6. an indicator of offending escalation in criminal career studies.

In 2003, the Australian Bureau of Statistics (ABS) released a National Offence Index (NOI) (ABS, 2003), and in July 2009, a second edition was released (ABS, 2009). The NOI is Australia's most recognised offence seriousness index and has been used in a number of studies. Although the NOI is a useful tool, it has two major shortcomings. First, in the NOI, seriousness rankings are not assigned to offences by applying objective rules to offences with different characteristics. Instead, seriousness rankings are assigned on the basis of an intuitive synthesis of information about statutory maxima, sentencing practice and public and expert opinion. Second, because the NOI allows non-legal factors (such as public opinion) to influence offence seriousness rankings, it is less than ideal as a measure of the way in which offence seriousness (as the courts view it) influences penalty choice.

This bulletin puts forward two alternative measures of offence seriousness and compares them to the NOI as predictors of penalty choice. It begins by discussing some of the issues associated with measuring offence seriousness and then describes two alternative measures and the methods used to construct them. Finally, the bulletin investigates the ability of each of the three measures to predict a sentence of imprisonment and to identify the principal offence for persons sentenced for multiple offences.

MEASURING OFFENCE SERIOUSNESS

Indexes of offence seriousness are usually based on one or more of the following criteria (Ferrante, 1998):

- maximum penalties set by parliaments,
- actual sentencing practice in the courts,
- public and expert opinion.

These three criteria are not independent. The courts are bound and directed by the maximum penalties set by parliament, and both the courts and parliament are influenced informally by public standards regarding criminal behaviour. Parliament also responds to the sentencing practice of the courts by increasing or decreasing maximum penalties or providing different sentencing options.

Each of these criteria, in isolation, leads to measures of offence seriousness that have different strengths and weaknesses. Measures based on statutory maxima alone recognise that parliament has already decided the seriousness of offences, taking into account public perceptions, the prevalence of each offence, any past sentencing practice, and the relative seriousness of each offence in comparison with other offences. They have the advantage of completeness (all offences have penalties attached to them, even if no-one has ever been charged with the offence). Their disadvantages include the fact that, in practice, the courts may treat offences with the same statutory maxima very differently and the fact that statutory maxima do not always reflect the seriousness of offences, as the public perceives them. Statutory maxima are also slow to reflect change in public opinion and an index based on statutory maxima can be difficult to develop without a comprehensive database of statutory provisions and their maximum penalties, such as the Lawcodes database[3] (Judicial Commission of NSW) which is used in this study.

Offence seriousness indexes based on sentencing practice are probably more sensitive than indexes based on statutory maxima to variations in offence seriousness from a judicial officer's perspective. This is important if the aim in measuring offence seriousness is to control for its influence or to examine its effect on sentencing. The main disadvantage of indexes based on sentencing practice is that factors other than offence seriousness (e.g. prior criminal record) can exert a strong effect on sentence severity. Indexes of offence seriousness based on sentencing practice are also vulnerable to the criticism that, wrongly or rightly, the public at large believes that sentences imposed by courts are too lenient (e.g. Indermaur, 1987; Jones, Weatherburn & McFarlane, 2008).

Australia's most recognised offence seriousness index, the NOI, is intended to capture offence seriousness from the perspectives of parliament, the public and the courts. The NOI derives from the Offence Seriousness Index (OSI) developed by the WA Crime Research Centre (CRC) in 1991 and revised in 1998 (Ferrante, 1998) following the introduction of the Australian Standard Offence Classification (ASOC) (ABS, 1997). The

CRC Index incorporated public perceptions as well as statutory maximum penalties. The first edition of the NOI, attached to the 2001-2002 Criminal Courts collection (ABS, 2003), used actual sentences handed down in the Higher Criminal Courts of Australia during 2000-2001 and included consultation within the justice sector. Following the release of the second edition of ASOC (ABS, 2008), the NOI was reviewed to ensure compatibility between ASOC and the NOI and to reflect changes in the perceived seriousness of some offences as identified through consultation with experts in the criminal justice field.

The principal limitations of the NOI, as noted earlier, are that the assignment of seriousness rankings is not the result of applying an objective set of rules to offences with different characteristics and the fact that the NOI allows non-legal factors such as public opinion to influence offence seriousness. The first limitation makes the NOI unavoidably subjective. The second is not a general limitation but limits the utility of the NOI for certain purposes. A researcher wanting to control for offence seriousness as viewed by the courts, for example, could be criticised for using a measure of offence seriousness so obviously influenced by factors other than what the courts think. The same argument could be made where the aim is to examine the impact of offence seriousness on bail or sentencing decisions.

SENTENCING PRINCIPLES

The statutory maximum measures of offence seriousness are based on two sentencing principles: (1) a court is to take account of the statutory maximum penalty when sentencing; and (2) the maximum penalty reflects parliament's view of the seriousness of the most extreme example of the offence. The first of these principles was stated in *Markarian v The Queen* (2005) 79 ALJR 1048 at [31], where the High Court said:

> "… careful attention to maximum penalties will almost always be required, first because the legislature has legislated for them; secondly, because they invite comparison between the worst possible case and the case before the court at the time; and thirdly, because in that regard they do provide, taken and balanced with all of the other relevant factors, a yardstick."

The second principle can be found in *R v Ronen* (2006) 62 ATR 321 at [73]-[74], where Howie J of the NSW Court of Criminal Appeal made reference to "Parliament's view of the seriousness of particular criminal conduct, as reflected in the maximum penalty for an offence".

The justification for basing a measure of offence seriousness on actual sentencing practice can be found in the principle that the severity of a sentence must reflect the seriousness of the offence, as stated in *R v Scott* [2005] NSWCCA 152, Howie J, Grove and Barr JJ agreeing, at [15]:

> "There is a fundamental and immutable principle of sentencing that the sentence imposed must ultimately reflect the objective seriousness of the offence committed and there must be a reasonable proportionality between the sentence passed and the circumstances of the crime committed."

To the extent that sentences reflect the seriousness of their corresponding offences, the median sentence of an offence type (controlling for other significant mitigating or aggravating factors) will be a measure of the "average seriousness" of that offence type. This makes it possible to assign different ranks to offences even when they have the same statutory maximum penalties.

THE CURRENT STUDY

The purpose of the current study is to present two new measures of offence seriousness – one based on statutory maximum penalties and one based on the sentencing practice of the courts – and then to compare these measures to the NOI as predictors of imprisonment and as predictors of which of two offences incurs the more severe sentence.

METHOD

CONSTRUCTION OF MEASURE 1: MEDIAN SENTENCE RANKING (MSR)

There are two key challenges in constructing a "median sentence" measure of offence seriousness based on actual sentencing practice. The first is that factors other than offence seriousness (especially prior criminal record) can and do influence penalty choice. One way of removing the influence of prior criminal record on penalty choice is to base the median seriousness rankings on penalties imposed upon offenders who have no prior criminal record. This approach was applied here.

The second challenge is that penalties vary in type as well as quantity. Measures of offence seriousness based on actual sentencing practice should incorporate information on the type of penalty and also the quantum (i.e. time period or dollar amount) of the penalty (where relevant) in a single numerical value that has (at a minimum) ordinal properties.

The penalty type/quantum problem is solved by a procedure which:

- ranks the various penalty types in order of severity, allowing each penalty type to be represented by an integer value;
- divides the penalty quantum by a uniform value large enough to produce a fractional value less than 1 - this study used 100,000 for fines, 100 years for penalty types recorded in days, months and years and 1,000 for penalty types recorded in hours[4]; and
- adds the penalty type integer and the penalty quantum fractional value to get a single numeric score that incorporates both the type and the quantity of the penalty.

This severity score allows all sentences to be compared on a single scale, and hence allows the median sentence to be identified.

The ranking of penalty types in this study follows the ranking used by the Judicial Commission of NSW and the NSW Bureau of Crime Statistics and Research (BOCSAR) for selecting and

reporting sentencing outcomes. Table 1 shows the penalty hierarchy, from least to most severe, based on NSW sentencing legislation and case law. It was developed in consultation with judicial officers and was intended to reflect the views of the courts. It is broadly consistent with the hierarchy of sentencing options in a report by the Australian Law Reform Commission (2006) and the Sentence Type classification used by the ABS in compiling national criminal court statistics (ABS, 2010). The complete list of penalties with their legal references is contained in Appendix Table A1.

Table 1. Penalty hierarchy in NSW

Penalty Type Rank	Penalty
1	Cautioned or dismissed without conviction
2	Bond/recognizance without conviction
3	Nominal sentence
4	Fine
5	Bond/recognizance without supervision
6	Bond/recognizance with supervision
7	Dismissed after Youth Justice Conference
8	Probation order without supervision
9	Probation order with supervision
10	Community service order
11	Suspended sentence without supervision
12	Suspended sentence with supervision
13	Periodic detention
14	Home detention
15	Control order or full-time imprisonment

The data used to calculate the MSR consisted of all cases[5] finalised in the NSW Children's, Local, District and Supreme Courts in the five years from 3 April 2000 (the commencement date of the *Crimes (Sentencing Procedure) Act* 1999 (NSW)). See Appendix 1 for more detail on the data source.

For each proven offence, the severity score[6] was calculated as follows:

1. An integer value was assigned according to the penalty type rank given in Table 1 (penalty type score).
2. A quantum score was calculated for each penalty type that had a quantum. For fines, the quantum was divided by 100,000. For Community Service Orders, the number of hours was divided by 1,000. For all other penalty types (other than life imprisonment where a quantum score of .99999 was used), the quantum was converted into years and divided by 100. The denominator of each fraction is an arbitrary figure and should be longer than the longest duration or fine amount. However, if any division exceeded 0.99999, the quantum score was truncated to 0.99999.
3. The quantum score was added to the penalty type score.
4. The resulting severity score ranged from 1.0 to 15.99999.

Then, using the severity score for each proven offence, the MSR was calculated as follows:

1. For each ASOC (2008) group, the median severity score was calculated.
2. To break ties, a value was added representing the proportion of cases greater than the median value (ranging from 0.00000001 to 0.00000499). This figure was computed by dividing the proportion of cases incurring a penalty more severe than the median penalty by 10,000,000. For example, where the median severity score was the same for two (or more) ASOC groups, say 4.00500 (i.e. a fine of $500), and 35.6 per cent of cases in the first ASOC group incurred a penalty more severe than a $500 fine while 25.2 per cent of cases in the second ASOC group did, then the first ASOC group (4.00500356) would rank higher than the second ASOC group (4.00500252).
3. The ASOC groups were then ranked by the adjusted median severity score. Appendix Table A2 shows the ranking of offence seriousness obtained by applying these procedures and the ranking assigned by the NOI to the same ASOC groups.
4. To break remaining ties, the lower ASOC 4-digit group was selected.

CONSTRUCTION OF MEASURE 2: MEDIAN STATUTORY MAXIMUM RANKING (MSMR)

To construct the MSMR index, the statutory maximum penalty was identified for each offence (using the Judicial Commission of NSW Lawcodes database), each lawcode was assigned to its appropriate ASOC group and then the median statutory maximum penalty was selected in each ASOC group as the measure of offence seriousness. In pursuing this strategy, only imprisonment and fine penalties were considered because NSW legislation sets maximum penalties in terms of imprisonment and fines. Penalties applicable only to corporations were excluded. The maximum penalty to which a person could be sentenced for a particular offence was selected regardless of jurisdiction, characteristics of the offence (e.g. value of goods stolen) and date of the offence. When a statutory maximum penalty was a fine expressed in 'Penalty Units' rather than in dollars, the current effective value of a penalty unit at the time of publication was used, being $110.

The construction of this index used an identical method to the construction of the MSR with the exception that for each offence considered, the statutory maximum penalty for that offence was used instead of the sentence of the court.

The ranking derived from this measure can be found in Appendix Table A2. However, the assignment of lawcodes to ASOC groups is only necessary if the aim is to produce a measure of offence seriousness based on the ASOC classification. A more fine-grained (and arguably more sensitive) scale can be obtained simply by ranking offences at the lawcode level in terms of their statutory maximum penalty.

TESTING THE UTILITY OF THE OFFENCE SERIOUSNESS MEASURES

The predictive validity of the MSR, MSMR and NOI was compared in two ways. The first test compared the three measures in terms of their ability to predict whether an offender was given a prison sentence. The second test compared the three measures in terms of their ability to predict which offence would incur the most severe sentence (where an offender was sentenced for multiple offences).

The data used to test the measures consisted of all NSW Children's, Local, District and Supreme Court cases finalised in 2007 (this time period does not overlap with the data from which the MSR and MSMR were derived so as to preserve predictive validity). The first test evaluated the effectiveness of the measures in predicting a sentence of imprisonment. A response variable called PRISON was calculated for each offence in the testing data and given the value 1 if the offence incurred a prison sentence and 0 otherwise.

The ordinal rankings for each of the seriousness measures were grouped into quintile groups and the prison variable was regressed individually against these measures for all cases in the test data. Quintile groups were used to ensure that the cell sizes in the regression were large enough to produce meaningful results. The logistic regression was computed by comparing the relative effect of each successive quintile group to the previous group (e.g. comparing the second least serious quintile to the least serious quintile, comparing the third least serious quintile to the second and so forth).

The c-statistic (also known as the Area Under the Receiver Operating Curve (ROC)) was chosen as the best way to understand the discriminatory power of the three measures to predict the modelled event. The c-statistic varies from 0.5 (meaning the model's predictions are no better than chance) to 1.0 (meaning the model always assigns cases perfectly). Higher values of the c-statistic therefore mean that the seriousness measure is better able to predict the outcome of interest. In this study, the Mann-Whitney statistic was used to calculate the Area under the ROC and a 95% confidence interval for this (Cortes & Mohri, 2005).

The second test to evaluate the effectiveness of the measures in predicting the principal offence was done by selecting offences from cases in the testing data where more than one offence incurred a distinct sentence. The offence with the most severe sentence was paired with an offence sentenced in the same case but given a less severe sentence. The order of these offences was randomly assigned and the difference between the seriousness rankings for each offence was used in the logistic regression to predict the principal offence. See Appendix 2 for a more detailed description.

The c-statistics for the resulting logistic regression models for both tests were then calculated and compared. The ordinal rankings and differences were classified into quintiles. This was done in order to get roughly equal-sized groups for the analysis.

RESULTS

CORRELATION BETWEEN THE MEASURES

The correlations between the MSR, MSMR and NOI rankings are presented below:

- MSR vs NOI 4-digit ASOC Ranking = 0.576
- MSR vs MSMR = 0.703
- MSMR vs NOI 4-digit ASOC Ranking = 0.560

The correlation coefficients show that while the rankings are correlated, each ranking contains significant information to differentiate it from the other rankings. This shows that the resultant rankings are quite different to each other but have some significant similarities. The most highly correlated measures were the MSR and the MSMR.

TEST 1: PREDICTING A SENTENCE OF IMPRISONMENT

Characteristics of the test sample

Appendix Table A3 shows the offender and offence characteristics of the cases in the 2007 data set used to conduct this test. There were a total of 140,908 unique offences chosen. Of these, 10,134 resulted in a sentence of imprisonment. This constituted 7.2 per cent of the total sample of offences. The test sample is typical of court cases in NSW in terms of age and gender of the offenders, the jurisdiction in which the offence was finalised, and the offence category.

Effectiveness of measures in predicting a sentence of imprisonment

Each of the offence seriousness measures was found to be statistically significant in the individual logistic regression models predicting the event of a sentence of imprisonment. Table 2 shows the c-statistics resulting from each of the logistic regression models. Each of these measures was above 0.7, which is typically regarded as an acceptable level of discrimination (Hosmer & Lemeshow, 2000). As can be seen from Table 2, each of the measures showed a statistically significant difference from the others. The MSR had the highest c-statistic, then the MSMR and last the NOI. This suggests that

the MSR is the best of the three measures in discriminating between offences that will incur a sentence of imprisonment and those that will not.

TEST 2: PREDICTING THE PRINCIPAL OFFENCE

Characteristics of the test sample

The sample used for this test was a subset of the sample used in the previous test. Appendix Table A4 shows the characteristics of this subset. The total number of cases was reduced to 83,636 from the sample used in the previous test due to the requirement that there be at least two concurrent offences. The offences were taken pair-wise with the principal offence being randomly assigned to be Offence A (in 49.9% of cases) or Offence B (in 50.1% of cases). The breakdown of offence categories reflects the fact that the sample required concurrent offences. The most notable difference was that there were proportionally fewer traffic offences in this data set than that shown in Appendix Table A3 (32% compared to 48%). The data set used to choose the principal offence also had a relatively higher proportion of males than the initial sample due to the fact that males are more likely to have concurrent offences. Similarly, matters dealt with in the District and Children's Courts have a higher representation due to their frequency of concurrent offences.

Effectiveness of measures in predicting the principal offence

Table 3 shows the c-statistics for the three logistic regression models predicting the principal offence. Again, each of the measures had c-statistics approximately 0.7 or higher, which suggests that the measures were able to adequately discriminate the principal from the non-principal offence for persons sentenced for multiple offences. The MSR was the most effective measure by a large margin and, in fact, the c-statistic for this measure suggested that it provided an excellent level of discrimination (Hosmer and Lemeshow, 2000). The NOI was the second best performing measure and the MSMR was the poorest performer on this test.

Table 2. Effectiveness of each measure in predicting a sentence of imprisonment

Test Measure	c-statistic	95% Confidence Limit Lower Bound	95% Confidence Limit Upper Bound
MSR	0.771	0.766	0.775
MSMR	0.756	0.752	0.760
NOI	0.739	0.735	0.743

Table 3. Effectiveness of each measure in predicting the principal offence

Test Measure	c-statistic	95% Confidence Limit Lower Bound	95% Confidence Limit Upper Bound
MSR	0.797	0.794	0.800
NOI	0.748	0.744	0.751
MSMR	0.683	0.680	0.687

CONCLUSION

The results show that all of the indexes performed fairly well. While this is not surprising in the case of the MSR and MSMR, it is a little surprising in the case of the NOI, given its more intuitive mode of construction. As to the question of which measure should be used, this clearly depends upon the circumstances and the amount of information available to derive the measures. The MSR is the better choice when the aim is to investigate or control for the influence of offence seriousness on the likelihood of imprisonment. The MSR is also the better choice when the task is to identify which of two offences will incur a more severe sentence. The NOI did not perform as well as the MSR in either task but this is not to say it is generally inferior. Indeed, the study showed the NOI to be a relatively robust measure of seriousness which may make it useful when alternative measures are not available or cannot be derived. The NOI may, for example, provide a better measure where the aim is to predict outcomes outside the criminal justice system, for example, predicting employment prospects for ex-offenders where the offence seriousness measure should reflect employer perceptions of prior offending, rather than the courts' perceptions.

The measures suggested in this bulletin are capable of further testing and refinement. Although the MSR was shown to be a good predictor of sentencing outcomes, such a result might be expected given that the MSR is based on actual sentencing data (albeit a different set of data to that which was used to test the measure). It is unclear how well the MSR would fare as a predictor of penalty choice in jurisdictions other than NSW but the value of the MSR would obviously be enhanced if it could be shown to predict penalty choices outside the jurisdiction in which it was developed. Similar considerations apply to the MSMR. Although the law pertaining to penalties is similar from jurisdiction to jurisdiction, it is not exactly the same. The value of the MSMR would be enhanced if it could be shown to be a good predictor of imprisonment in jurisdictions other than NSW.

The issue of public perceptions also needs to be addressed. The two measures presented here may be inferior to the NOI as predictors of public views about the relative seriousness of different offences. This specific issue was not addressed here and requires further examination. It would be interesting to create measures of offence seriousness based on public perceptions and explore their association with measures of seriousness based on court sentencing practice or statutory maxima. The key point to remember is that there is no "right" way to measure offence seriousness. A variety of measures geared for different purposes is required. The results presented here are intended to stimulate the construction of other measures of offence seriousness and further research designed to evaluate their relative strengths and weaknesses. Future studies could test these indexes when performing other tasks, such as predicting the quantum of sentence or predicting the use of penalties other than imprisonment.

NOTES

1. Judicial Commission of New South Wales

2. NSW Bureau of Crime Statistics and Research

3. The Lawcodes database provides standard codes to describe offences in NSW. It is available online at http://lawcodes.judcom.nsw.gov.au/lawcodes/

4. These values are greater than all, or almost all, actual penalties that can be imposed. Dividing by a uniform round number enables the researcher to easily identify the original penalty quantum.

5. The Local and Children's Court data are counts of finalised appearances rather than finalised cases as in the District and Supreme Court data. A finalised appearance refers to a group of one or more charges against a single individual which are finalised on a single day, whereas a case is a number of charges against a single individual that were registered on the same court file. For simplicity, the term "case" is used throughout this paper.

6. For example, a case may contain an armed robbery offence (ASOC 0611 *Aggravated robbery*) which received 6 months imprisonment and a resist or hinder police officer offence (ASOC 1562 *Resist or hinder police officer or justice official*) which received a $750 fine. The severity score for the robbery offence would be 15.005, comprised in the following way: 15 from the penalty type rank for full-time imprisonment and the penalty quantum of .005 from 6 months converted into 0.5 of a year divided by 100. The severity score for the resist or hinder police officer offence would be 4.00750: 4 from the penalty type rank for a fine and the penalty quantum of .00750 from $750 divided by 100,000.

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APPENDIX

APPENDIX 1: DATA USED FOR CALCULATING THE MSR

The data used to calculate the MSR was obtained from all cases finalised in the NSW Children's, Local, District and Supreme Criminal Courts between 3 April 2000 and 31 March 2005. The start date of 3 April 2000 was chosen because:

- this was the commencement date of the *Crimes (Sentencing Procedure) Act* 1999 (NSW); and
- this excludes sentences handed down before or soon after *Pearce v The Queen* (1998) 194 CLR 610 (which outlined the correct method for sentencing offenders with multiple offences).

The Children's Court data was included even though special principles apply to the sentencing of juvenile offenders. The principles in s 6 of the *Children (Criminal Proceedings) Act* 1987 place a greater emphasis on factors other than the gravity of the offence, such as the need for guidance and assistance, than for adult offenders. Nevertheless, Children's Court outcomes have been included to gain better coverage of offences commonly committed by juveniles.

However, the sample excludes:

- offences committed by corporations;
- offences against regulations and other subordinate legislation prior to 1 January 2003 as these were not collected by BOCSAR; and
- cases where the defendant had a prior criminal record (to ensure as much as possible that the penalty reflected the offence) with the exception of cases involving these breaches of justice orders, which must, by their nature, follow a prior proven offence:
  - ASOC 1512 Breach of home detention
  - ASOC 1513 Breach of suspended sentence
  - ASOC 1521 Breach of community service order
  - ASOC 1522 Breach of parole
  - ASOC 1524 Breach of bond - probation
  - ASOC 1525 Breach of bond – other
  - ASOC 1529 Breach of community based order, nec.

The counting unit is a finalised court case. The initial sample included 683,703 cases. After processing the exclusions listed above the reference sample comprised 206,250 cases, and a total of 280,059 offences.

The measure was computed at the ASOC 4-digit group level. Where there were no cases at the 4-digit ASOC group level, the measure of seriousness was calculated at the 3-digit ASOC subdivision level. To break ties, the lower ASOC 4-digit group was selected.

APPENDIX 2: METHOD FOR TESTING EACH MEASURE'S ABILITY TO PREDICT THE PRINCIPAL OFFENCE

1. Two offences were chosen which had sentences of different severity.

2. The offences were randomly assigned to OFFENCE_A and OFFENCE_B.

3. A response variable PRINPEN was created, setting it to 1 if OFFENCE_A had the more severe sentence and 0 otherwise.

4. The three measures of seriousness (MSR, MSMR, NOI) were then calculated for each offence and the differences between the measures for OFFENCE_A and the corresponding measures for OFFENCE_B were taken (measure_diff = measure (OFFENCE_A) – measure (OFFENCE_B)).

5. The measure_diff values were then grouped into quintiles.

6. For each measure of seriousness, a regression was performed using measure_diff quintile group as the parameter and PRINPEN=0 as the probability modelled.

Appendix Table A1. Penalty type rank: penalties by legislation

Penalty Type Rank	Penalty	Crimes (Sentencing Procedure) Act 1999 (NSW)	Crimes Act 1914 (Cth)	Principal Penalty		Other
				Children (Criminal proceedings) Act 1987 (NSW)	Young Offenders Act 1997 (NSW)	
1	Cautioned or dismissed without conviction	s10(1)(a) dismissal without conviction	s19B dismissal without conviction	s33(1)(a)(i) dismissal with or without caution	s31 caution by court	
2	Bond/recognizance without conviction	s10(1)(b) bond and s10(1)(c) intervention plans without conviction	s19B recognizance without conviction	s33(1)(a)(ii) bond without conviction		
3	Nominal sentence	s10A conviction with no other penalty				rising of the court
4	Fine	ss15-16 fines	s4B pecuniary penalties	s33(1)(c) fine		
5	Bond/recognizance without supervision	s9 bond [without supervision]	s20(1)(a) recognizance [without supervision]	s33(1)(b) bond and s33(1)(d) bond and fine [without supervision]		
6	Bond/recognizance with supervision	s9 bond [with supervision]	s20(1)(a) recognizance [with supervision]	s33(1)(b) bond and s33(1)(d) bond and fine [with supervision]		
7	Dismissed after Youth Justice Conference				s57(2) dismissed after Youth Justice Conference (YJC)	
8	Probation order without supervision			s33(1)(e) probation order and s33(1)(e1) probation order and fine [without supervision]		
9	Probation order with supervision			s33(1)(e) probation order and s33(1)(e1) probation order and fine [with supervision]		
10	Community service order	s8 community service order	s20AB	s33(1)(f) community service order and s33(1)(f1) community service order and probation order		
11	Suspended sentence without supervision	s12 suspended sentence [without supervision]	s20(1)(b) conditional release forthwith [without supervision]	s33(1B) suspended control order [without supervision]		
12	Suspended sentence with supervision	s12 suspended sentence [with supervision]	s20(1)(b) conditional release forthwith [with supervision]	s33(1B) suspended control order [with supervision]		
13	Periodic detention	s6 periodic detention	s20AB			
14	Home detention	s7 home detention	s20AB			
15	Control order or full-time imprisonment	s5 full-time imprisonment	s17A and s20(1)(b) conditional release after serving a specified period of imprisonment	s33(1)(g) control order		

Appendix Table A2. Median Sentence Ranking, Median Statutory Maximum Ranking and the National Offence Index and Ranking for each ASOC group

ASOC (2008) group	ASOC (2008) group description	Median Sentence Ranking (MSR)	Median Statutory Maximum Ranking (MSMR)	National Offence Index (2009)	National Offence Index (2009) Ranking of ASOC groups(a)	Frequency in reference data sample	Notes
0111	Murder	1	1	1	1	59	
0121	Attempted murder	2	4	2	2	22	
1011	Import illicit drugs	3	3	14	11	215	
0131	Manslaughter	4	5	3	3	63	
0321	Non-assaultive sexual offences against a child	5	23	8	6	8	
1021	Deal or traffic in illicit drugs - commercial quantity	6	2	17	13	210	
1031	Manufacture illicit drugs	7	8	18	14	24	
0511	Abduction and kidnapping	8	6	24	18	77	
1012	Export illicit drugs	9	16	15	12	9	
1513	Breach of suspended sentence	10	59	107	89	3144	(b)
1512	Breach of home detention	11	58	106	88	0	(b) (c)
0311	Aggravated sexual assault	12	43	7	5	1956	
0521	Deprivation of liberty/false imprisonment	13	63	26	20	10	
1542	Bribery involving government officials	14	24	57	43	23	
1692	Bribery excluding government officials	15	25	118	98	29	
0923	Possess equipment to make false/illegal instrument	16	51	62	48	11	
1525	Breach of bond - other	17	41	114	95	5523	(b)
1521	Breach of community service order	18	37	110	91	4273	(b)
1522	Breach of parole	19	38	109	90	0	(b) (c)
0312	Non-aggravated sexual assault	20	56	11	9	91	
1022	Deal or traffic in illicit drugs - non-commercial quantity	21	10	21	16	1193	
0621	Blackmail and extortion	22	48	41	30	18	
0132	Driving causing death	23	47	4	4	303	
0922	Forgery of documents	24	57	61	47	2073	
0611	Aggravated robbery	25	7	25	19	1065	
1524	Breach of bond - probation	26	40	111	92	421	(b)
0612	Non-aggravated robbery	27	15	40	29	186	
1511	Escape custody offences	28	49	105	87	70	
0322	Child pornography offences	29	62	10	8	139	
0811	Theft of a motor vehicle	30	53	68	54	159	
0323	Sexual servitude offences	31	54	9	7	0	(c)
1211	Property damage by fire or explosion	32	17	44	33	200	
0911	Obtain benefit by deception	33	71	60	46	8669	
0711	Unlawful entry with intent/burglary, break and enter	34	50	59	45	1712	
0299	Other acts intended to cause injury, nec	35	44	30	23	52	
0991	Dishonest conversion	36	19	64	50	3202	
0821	Theft from a person (excluding by force)	37	13	70	56	169	
1312	Criminal intent	38	20	132	111	495	
0813	Theft of motor vehicle parts or contents	39	30	71	57	0	(c) (d)
0812	Illegal use of a motor vehicle	40	33	69	55	1148	
0211	Serious assault resulting in injury	41	26	23	17	5826	
0291	Stalking	42	32	31	24	513	
0921	Counterfeiting of currency	43	14	56	42	37	
1543	Immigration offences	44	21	101	83	14	
1551	Resist or hinder government officer concerned with government security	45	83	139	118	0	(c)
1559	Offences against government security, nec	46	84	45	34	4	
1694	Import/export regulations	47	76	80	64	208	
1313	Riot and affray	48	18	128	107	556	
1529	Breach of community-based order, nec	49	42	115	96	786	(b)
0822	Theft of intellectual property	50	79	73	58	81	
0931	Fraudulent trade practices	51	52	63	49	134	
1622	Disease prevention offences	52	103	93	76	7	
1693	Quarantine offences	53	22	102	84	54	
1224	Soil pollution offences	54	102	88	72	8	
0532	Threatening behaviour	55	46	42	31	470	
1569	Offences against justice procedures, nec	56	75	103	85	567	
0841	Illegal use of property (except motor vehicles)	57	36	78	62	3	
1611	Defamation and libel	58	72	120	100	0	(c)
1612	Offences against privacy	59	73	81	65	20	
0411	Driving under the influence of alcohol or other substance	60	81	37	27	1352	
1623	Occupational health and safety offences	61	98	94	77	123	
1123	Deal or traffic regulated weapons/explosives offences	62	35	52	40	26	
0831	Receive or handle proceeds of crime	63	85	77	61	4010	
1032	Cultivate illicit drugs	64	9	19	15	1851	
0932	Misrepresentation of professional status	65	86	65	51	162	
1563	Prison regulation offences	66	70	117	97	159	
0491	Neglect or ill-treatment of persons under care	67	99	34	25	42	
1222	Water pollution offences	68	101	87	71	141	
1691	Environmental regulation offences	69	92	100	82	887	
1221	Air pollution offences	70	100	86	70	9	

Appendix Table A2. Median Sentence Ranking, Median Statutory Maximum Ranking and the National Offence Index and Ranking for each ASOC group - continued

ASOC (2008) group	ASOC (2008) group description	Median Sentence Ranking (MSR)	Median Statutory Maximum Ranking (MSMR)	National Offence Index (2009)	National Offence Index (2009) Ranking of ASOC groups(a)	Frequency in reference data sample	Notes
0212	Serious assault not resulting in injury	71	28	27	21	1786	
1695	Procure or commit illegal abortion	72	93	43	32	0	(c)
1325	Offences against public order sexual standards	73	88	137	116	317	
0531	Harassment and private nuisance	74	80	82	66	61	
1411	Drive while licence disqualified or suspended	75	67	141	120	7669	
1431	Exceed the prescribed content of alcohol or other substance limit	76	77	83	67	61469	
0499	Other dangerous or negligent acts endangering persons, nec	77	90	35	26	72	
1549	Offences against government operations, nec	78	82	104	86	3064	
1334	Cruelty to animals	79	87	123	103	705	
1531	Breach of violence order	80	68	113	94	2602	
1532	Breach of non-violence orders	81	69	119	99	0	(c)
1323	Censorship offences	82	78	121	101	24	
1112	Sell, possess and/or use prohibited weapons/explosives	83	11	47	36	726	
1541	Resist or hinder government official (excluding police officer, justice official or government security officer)	84	106	140	119	115	
0213	Common assault	85	61	28	22	13387	
1412	Drive without a licence	86	118	142	121	11033	
1321	Betting and gambling offences	87	105	134	113	121	
1631	Commercial/industry/financial regulation	88	129	79	63	2613	
0329	Non-assaultive sexual offences, nec	89	95	12	10	39	
1111	Import or export prohibited weapons/explosives	90	12	46	35	0	(c) (e)
0999	Other fraud and deception offences, nec	91	116	66	52	1972	
1561	Subvert the course of justice	92	114	58	44	324	
0412	Dangerous or negligent operation (driving) of a vehicle	93	126	38	28	12295	
1122	Misuse of regulated weapons/explosives	94	74	51	39	1653	
1219	Property damage, nec	95	31	85	69	7024	
1562	Resist or hinder police officer or justice official	96	29	138	117	3518	
1121	Unlawfully obtain or possess regulated weapons/explosives	97	45	50	38	2014	
1322	Liquor and tobacco offences	98	108	135	114	923	
1421	Registration offences	99	122	145	123	10934	
1229	Environmental pollution, nec	100	115	90	74	523	
1324	Prostitution offences	101	96	136	115	411	
1625	Dangerous substances offences	102	107	96	79	34	
1626	Licit drug offences	103	89	97	80	200	
1439	Regulatory driving offences, nec	104	112	150	127	23239	
0829	Theft (except motor vehicles), nec	105	27	75	60	6727	
1041	Possess illicit drugs	106	55	124	104	7276	
1223	Noise pollution offences	107	109	89	73	45	
1629	Public health and safety offences, nec	108	125	98	81	2525	
1432	Exceed the legal speed limit	109	119	148	125	9710	
1621	Sanitation offences	110	110	92	75	0	(c)
1119	Prohibited weapons/explosives offences, nec	111	66	48	37	286	
1699	Other miscellaneous offences, nec	112	117	155	131	322	
0823	Theft from retail premises	113	34	74	59	4999	
1332	Offensive behaviour	114	97	131	110	4638	
1422	Roadworthiness offences	115	123	146	124	64	
1523	Breach of bail	116	39	112	93	374	
1099	Other illicit drug offences, nec	117	60	127	106	824	
1333	Vilify or incite hatred on racial, cultural, religious or ethnic grounds	118	94	122	102	0	(c)
1624	Transport regulation offences	119	111	95	78	1331	
1042	Use illicit drugs	120	65	125	105	668	
1419	Driver licence offences, nec	121	120	143	122	3055	
1129	Regulated weapons/explosives offences, nec	122	104	53	41	116	
1331	Offensive language	123	128	130	109	2766	
1329	Regulated public order offences, nec	124	127	152	129	343	
1433	Parking offences	125	121	149	126	5906	
1319	Disorderly conduct, nec	126	113	133	112	46	
1441	Pedestrian offences	127	124	153	130	21	
0933	Illegal non-fraudulent trade practices	128	64	67	53	3	
1326	Consumption of legal substances in prohibited spaces	129	131	151	128	13	
1311	Trespass	130	130	129	108	1926	
1212	Graffiti	131	91	84	68	136	(f)

(a) The NOI is an index of ASOC that includes divisions (2-digit codes), sub-divisions (3-digit codes) and groups (4-digit codes) and is ranked from 1 to 157. The MSR and MSMR are rankings at the ASOC group (4-digit codes) level and range from 1 to 131. In order to be able to compare the three indexes, a 4-digit NOI ranking was produced that ranks only the ASOC groups (4-digit codes) from 1 to 131 in the same order as they appeared in the NOI (that is, all supplementary codes have been excluded).

(b) As breaches of justice orders do not have statutory maxima, this 4-digit ASOC group has a Median Statutory Maximum Ranking (MSMR) calculated at the 3-digit ASOC subdivision level.

(c) With no cases, this 4-digit ASOC group has a Median Sentence Ranking (MSR) and a Median Statutory Maximum Ranking (MSMR) calculated at the 3-digit ASOC subdivision level.

(d) Theft from a motor vehicle is not a specific offence under NSW Legislation. These offences would be included in ASOC 0829 Theft (except motor vehicles), nec.

(e) There are no separate lawcodes for import/export of prohibited weapons as distinct from other Tier 2 goods (eg child pornography, counterfeit credit cards) under the *Commonwealth Customs Act* 1901. The import/export of all Tier 2 goods is included in ASOC 1694 Import/export regulations.

(f) Graffiti offenders may be charged with property damage and so would be included in ASOC 1219 Property damage, nec.

Appendix Table A3. Characteristics of the test sample for predicting a sentence of imprisonment

		N	%
Total number of unique offences in the test data set		140908	100.00
Whether imprisonment sentence imposed	0 - No imprisonment sentence imposed	130774	92.81
	1 - Imprisonment sentence imposed	10134	7.19
Age at time of finalisation (years)	Under 20	18071	12.82
	20-29	48026	34.08
	30-39	34848	24.73
	40-49	22889	16.24
	50-59	10340	7.34
	60 or older	4990	3.54
	Unknown	1744	1.24
Gender	Male	112855	80.09
	Female	28053	19.91
Jurisdiction of finalisation	Children's Court	6413	4.55
	Local Court	131835	93.56
	District Court	2567	1.82
	Supreme Court	93	0.07
Offence Category*	Homicide and related offences	175	0.12
	Acts intended to cause injury	16568	11.76
	Sexual assault and related offences	628	0.45
	Dangerous or negligent acts endangering persons	4419	3.14
	Abduction, harassment and other offences against the person	532	0.38
	Robbery, extortion and related offences	940	0.67
	Unlawful entry with intent/burglary, break and enter	2412	1.71
	Theft and related offences	10185	7.23
	Fraud, deception and related offences	3055	2.17
	Illicit drug offences	7145	5.07
	Prohibited and regulated weapons and explosives offences	843	0.60
	Property damage and environmental pollution	5324	3.78
	Public order offences	8671	6.15
	Traffic and vehicle regulatory offences	67553	47.94
	Offences against justice procedures, government security and government operations	10146	7.20
	Miscellaneous offences	2308	1.64
	Unknown offence category	4	0.00
Number of concurrent offences	0	87194	61.88
	1	27397	19.44
	2	13171	9.35
	3	6768	4.80
	4	2367	1.68
	5	1339	0.95
	6	870	0.62
	7 or more	1802	1.28

* ASOC (2008) Division

Appendix Table A4. Characteristics of the test sample for predicting the principal offence

		N	%
Total number of offence pairs in test data set		83636	100.00
Which offence incurred the more severe sentence	0 - Offence A incurred the more severe sentence	41717	49.88
	1 - Offence B incurred the more severe sentence	41919	50.12
Age at time of finalisation (years)	Under 20	12340	14.75
	20-29	32181	38.48
	30-39	22218	26.57
	40-49	11746	14.04
	50-59	3665	4.38
	60 or older	1209	1.45
	Unknown	277	0.33
Gender	Male	70761	84.61
	Female	12875	15.39
Jurisdiction of finalisation	Children's Court	5174	6.19
	Local Court	75225	89.94
	District Court	3161	3.78
	Supreme Court	76	0.09
Offence categories* (Offence A and Offence B combined)	Homicide and related offences	140	0.08
	Acts intended to cause injury	23781	14.22
	Sexual assault and related offences	1258	0.75
	Dangerous or negligent acts endangering persons	5422	3.24
	Abduction, harassment and other offences against the person	1160	0.69
	Robbery, extortion and related offences	1280	0.77
	Unlawful entry with intent/burglary, break and enter	4493	2.69
	Theft and related offences	12769	7.63
	Fraud, deception and related offences	4488	2.68
	Illicit drug offences	12920	7.72
	Prohibited and regulated weapons and explosives offences	1991	1.19
	Property damage and environmental pollution	9261	5.54
	Public order offences	12156	7.27
	Traffic and vehicle regulatory offences	54120	32.35
	Offences against justice procedures, government security and government operations	19388	11.59
	Miscellaneous offences	2645	1.58

* ASOC (2008) Division