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Why is the NSW juvenile reconviction rate higher than expected?

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***Aim**: To examine reasons for the apparent increase in the rate of juvenile reconviction between 2004-05 and 2006-07.*

***Method**: Observed and predicted reconviction rates were investigated for the 2004-05 (n=4,225) and 2006-07 (n=4,368) cohorts of juvenile offenders given non-custodial sanctions. Various factors (for example, number of prior police cautions) were included in the Group Risk Assessment Model to determine whether they eliminated the discrepancy between the observed and predicted reconviction rates. The profile of re-offences across cohorts was also compared.*

***Results**: Two factors may explain the discrepancy between the observed and predicted reconviction rates in 2006-07: (1) a higher than expected rate of reconviction among juveniles dealt with via a Youth Justice Conference; and (2) the absence in the Group Risk Assessment Model of any control for the number of prior police cautions received by a juvenile offender. The higher than expected rate of reconviction among juveniles dealt with via a Youth Justice Conference in 2006-07 appears partly attributable to changes in policing practices.*

***Conclusion**: It is recommended that the use of the Group Risk Assessment Model be restricted to young offenders dealt with by way of the Children's Court.*

INTRODUCTION

In November 2006, the then Premier of NSW announced the 10-year State Plan to improve delivery of Government services across a broad range of areas, including the criminal justice system (NSW Government, 2006). One of the priorities (R2) was to reduce the proportion of offenders who re-offend within 24 months of a finalised court appearance or conference by 10 per cent by 2016. Many of the strategies aimed at reducing re-offending concern juveniles and involve early intervention.

It is difficult to assess progress made in reducing re-offending. First, not all re-offending leads to an officially recorded reconviction with many re-offences not being detected by the justice system. Second, officially recorded reconviction rates are affected not only by the effectiveness of the justice system in dealing with offenders, but also by the characteristics of the offenders coming to court. Indigenous offenders, for example, have higher rates of reconviction than non-Indigenous offenders (Smith & Jones, 2008a). If the number of Indigenous offenders brought to court increases from one year to the next, the overall reconviction rate may increase, even if Government efforts to reduce re-offending are effective. Hence, examination of changes in unadjusted rates of reconviction can led to false conclusions.

To address this issue, in 2008, the NSW Bureau of Crime Statistics and Research developed a technique known as the Group Risk Assessment Model (GRAM; Smith & Jones, 2008a, 2008b). The methodology of GRAM was adapted from work conducted by the U.K. Home Office (for example, Whiting & Cuppleditch, 2006). GRAM uses information on offence and offender characteristics in a base year to predict the reconviction rate for a subsequent study year. The observed and predicted rates of reconviction are then compared. If rates of reconviction are decreasing over time in response to justice system initiatives, observed and predicted rates of reconviction should diverge, with observed rates being less than those that would have been predicted using weights from the earlier base year. Separate GRAM models have been developed for various cohorts: juveniles given a non-custodial sanction, adults given a non-custodial sanction and adults given a custodial sanction (Smith & Jones, 2008a, 2008b).

Using the base year 2004-05, a comparison of the observed and predicted rates of reconviction for the 2006-07 cohort of juvenile offenders given non-custodial sanctions revealed that the observed rate of reconviction was actually higher than the predicted rate of reconviction (57.9% observed rate compared to 54.7% predicted rate; a discrepancy of 3.3[1] percentage points with a 95% confidence interval of the discrepancy of 1.2 to 5.3).[2] This could mean that the programs administered by the NSW Department of Juvenile Justice (DJJ) are becoming less effective in reducing juvenile re-offending. However, there are

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many other possible explanations. For example, the weights assigned to the factors included in GRAM may be changing over time, the controls included in GRAM may not be sufficiently comprehensive or the range of offences and re-offences that young people are being brought to court or conference for may be broadening. The purpose of this bulletin is to conduct an analysis of these possible explanations.

GROUP RISK ASSESSMENT MODEL (GRAM)

All data used in the current bulletin were obtained from the Re-Offending Database, ROD, constructed and maintained by the NSW Bureau of Crime Statistics and Research (Hua & Fitzgerald, 2006). Technically, GRAM is a logistic regression model predicting reconviction on the basis of a number of offence and offender characteristics. The logistic regression coefficients that measure the influence of these characteristics on risk of reconviction in GRAM are based on data from a cohort of offenders in a base year. These coefficients are applied to a cohort of offenders from a later study year to obtain the predicted reconviction rate for the study cohort. In the current study, the base year is the 2004-05 financial year (n=4,225) and the study year is the 2006-07 financial year (n=4,368).[3]

For the purposes of GRAM:

- A 'conviction' refers to any proven offence. This includes offences dismissed or given a bond under Section 10 of the *Crimes (Sentencing Procedure) Act 1999*, offences dismissed with caution under the *Children's (Criminal Proceedings) Act 1987* and offences dismissed with caution under the *Young Offenders Act 1997*[4];
- The 'index appearance' is the earliest appearance in the financial year of interest (either 2004-05 or 2006-07) that resulted in a conviction in a Children's Court or a completed outcome plan following a Youth Justice Conference (YJC);
- 'Reconviction' is defined as a subsequent conviction by a children's or adult court, or completion of an outcome plan following a YJC, for an offence occurring within 24 months of the index appearance and dealt with by court or conference within 27 months of the index appearance.[5]

A wide range of potential explanatory variables were considered for inclusion in GRAM and those with a Wald chi-square statistic *p*-value for the effect of less than .05 included. For juvenile offenders, the characteristics adjusted for in GRAM were:

- age (10 to 14 years, 15 to 17 years, 18 years or older);
- sex (male, female);
- Indigenous status (non-Indigenous, Indigenous, unknown);
- jurisdiction of index appearance (Children's Court, Youth Justice Conference);
- index offence type (violent, property, other); and
- number of convictions (including YJCs) in the eight years prior to the index appearance (0, 1, 2 to 3, 4 or more).[6]

Individual predicted probabilities for the 2006-07 cohort were obtained by applying the 2004-05 logistic regression coefficients to the data for the 2006-07 cohort. The predicted reconviction rate for the 2006-07 cohort was defined as the mean of these individual predicted probabilities. Ninety-five per cent confidence intervals around the predicted and observed reconviction rates were calculated using the score method with the continuity correction recommended by Newcombe (1998a). The difference between the predicted and observed rates of reconviction and the associated confidence interval around this difference was then compared using the score approach with the continuity correction recommended by Agresti and Caffo (2000) and by Newcombe (1998b). If the confidence intervals around this difference included zero it was concluded that there was no evidence of any change in reconviction rates over time.

Table 1 shows the estimates for the model predicting reconviction for the 2004-05 cohort of offenders convicted in juvenile jurisdictions. The model shows that after controlling for all other factors included in the model:

- females had lower odds of reconviction than males;
- Indigenous offenders had higher odds of reconviction and offenders of unknown Indigenous status had lower odds of reconviction than non-Indigenous offenders;
- offenders aged 10-14 years had higher odds of reconviction than offenders aged 18 years or older;
- offenders who completed a Youth Justice Conference had lower odds of reconviction than offenders convicted in Children's Court;
- offenders convicted of violent, sexual or robbery offences had lower odds of reconviction than offenders convicted of property offences; and
- Offenders with four or more prior convictions had 3.6 times the odds of reconviction than offenders with no prior convictions.

Table 2 shows the observed and predicted rates of reconviction among the 2004-05 and 2006-07 cohorts of juvenile offenders given non-custodial sanctions. The observed rate of reconviction for the 2006-05 cohort of 57.9 per cent (95% confidence interval 56.5 to 59.5 per cent) was greater than the predicted rate of reconviction of 54.7 per cent (95% confidence interval 53.2 to 56.1 per cent), a discrepancy of 3.3[1] percentage points (95% confidence interval 1.2 to 5.3).

POSSIBLE EXPLANATIONS FOR THE DIFFERENCE BETWEEN THE OBSERVED AND PREDICTED RECONVICTION RATES

There are several possible explanations for the higher than expected rate of juvenile reconviction for the 2006-07 cohort. These may be operating concurrently.

Table 1. Logistic regression model predicting reconviction within two years of the index appearance for the 2004-05 juvenile cohort (n=4,225)

	p-value for Type 3 analysis of effect	Parameter estimate (standard error)	*p*-value for parameter estimate	Odds ratio (95% confidence interval)
(Intercept)		-0.081 (0.113)	.475	
Sex				
Male[a]				1.00
Female	<.001	-0.602 (0.085)	<.001	0.55 (0.46, 0.65)
Indigenous status				
Non-Indigenous[a]				1.00
Indigenous	<.001	0.660 (0.080)	<.001	1.94 (1.65, 2.26)
Unknown		-2.209 (0.170)	<.001	0.11 (0.08, 0.15)
Age				
18 years or more[a]				1.00
15-17 years	<.001	0.308 (0.095)	.001	1.36 (1.13, 1.64)
10-14 years		0.598 (0.125)	<.001	1.82 (1.42, 2.32)
Jurisdiction of the index appearance				
Children's Court[a]				1.00
Youth Justice Conference	<.001	-0.389 (0.085)	<.001	0.68 (0.57, 0.80)
Principal offence type at the index appearance				
Property[a]				1.00
Violent/sexual/robbery	.005	-0.272 (0.088)	.002	0.76 (0.64, 0.91)
Other		-0.061 (0.085)	.471	0.94 (0.80, 1.11)
Number of convictions in the eight years prior to the index appearance				
0[a]				1.00
1	<.001	0.484 (0.097)	<.001	1.62 (1.34, 1.96)
2 to 3		0.706 (0.109)	<.001	2.03 (1.64, 2.51)
4 or more		1.286 (0.156)	<.001	3.62 (2.67, 4.91)

Note. There were no indicators of problems with multicollinearity in the logistic regression model. Parameter estimates remained stable after the inclusion of each variable, standard errors did not appear to be inflated and variance inflation factors estimated with linear regression were less than 2.5 for all indicator variables.

[a] Reference category.

These possible explanations include:

a) prior offending is not effectively controlled for, so that the GRAM predictions are not accurate;

b) the weights (regression coefficients) in GRAM are changing over time, so that the GRAM predictions are becoming less accurate;

c) the distribution of penalties imposed on juvenile offenders are changing in ways that increase the risk of re-offending;

d) the seriousness of juvenile offending is increasing over time, so that the risk of re-offending is increasing;

e) the time taken to finalise cases is decreasing over time, so that a higher proportion of re-offences are being captured by GRAM;

f) changes in policing practices such as:

   i. a reduced threshold for formally proceeding against re-offenders, with police more likely to bring proceedings than they once were; or

   ii. more proactive targeting of young offenders, such as increased enforcement of compliance with justice orders; and

g) one or more of the programs administered by DJJ is becoming less effective at managing juvenile re-offending.

While the last two explanations (f) and (g) cannot be tested directly, the remaining can be and their results should shed some light on the plausibility of the last two explanations. Explanation (f) can be partially tested. The following sections explain the rationale for explanations (a) to (f), the method for testing each explanation and the results obtained. Conclusions are then drawn.

Table 2. Observed and predicted rates of reconviction among the 2004-05 and 2006-07 juvenile cohorts

Year	N	Observed (95% confidence interval)	Predicted (95% confidence interval)	Difference between observed and predicted (95% confidence interval)
2004-05	4,225	54.1 (52.6, 55.6)	n/a[a]	
2006-07	4,368	57.9 (56.5, 59.4)	54.7 (53.2, 56.1)	3.3[b] (1.2, 5.3)

[a] Not applicable since the 2004-05 is the base year.

[b] The difference between the observed and predicted rates of reconviction was calculated prior to rounding these rates to one decimal place. That is, observed - predicted = 57.92 - 54.66 = 3.26. This difference value was then rounded to 3.3.

(a) Are the measures of prior offending included in GRAM sufficient controls?

A key predictor of propensity to be reconvicted is the number of prior contacts with the criminal justice system (for example, Smith & Jones, 2008a). In 1998, the *Young Offenders Act 1997* established a graded system of court diversion options, with a Children's Court proceeding considered as the option of last resort (Chan, 2005 provides a comprehensive review of the legislation). Warnings, formal police cautions and YJCs are often mandated as the preferred option if the offence characteristics meet certain eligibility criteria. The number of prior convictions (including YJCs) is adjusted for in juvenile GRAM, but the number of prior police cautions[7] is not. Prior cautions were not considered for inclusion in juvenile GRAM because when GRAM was being developed, prior caution data were not available.

Prior convictions are counted for eight years prior to the index appearance. For the 2004-05 cohort the prior conviction count includes convictions from 1996-97 until the index appearance. For the 2006-07 cohort, the prior conviction count includes convictions from 1998-99 until the index appearance. Juveniles apprehended for offending from 1998 onwards were likely to be cautioned, whereas this was not a formal option for juveniles apprehended before 1998. The count of prior convictions included in GRAM for offences committed before 1998 provides a better marker of reconviction propensity than the count of prior convictions for offences committed from 1998 onwards, where cautions were a formal option. Many offenders who were recorded in GRAM as having no prior convictions for offences committed after 1998 may in fact have received multiple cautions. GRAM's ability to predict reconviction propensity may therefore have been weakened by the absence of a control for number of prior cautions.

Method

If the absence of a control for the number of prior cautions is one of the reasons for the discrepancy between predicted and observed juvenile reconviction rates, the inclusion of such a control should reduce or eliminate the discrepancy. The number of prior cautions comprised a sum of all police cautions recorded since 1998 until the index appearance. Since the number of prior cautions is a count variable, Poisson regression was used to determine if there was a difference in the number of prior cautions across cohorts. For the adjusted analysis, the explanatory variables in the official juvenile GRAM (age, sex, Indigenous status, offence type, jurisdiction and number of prior convictions) were also added to the Poisson regression. Chi-square tests of association were used to determine whether number of prior cautions was related to reconviction for either cohort. In this analysis, the number of prior cautions was classified as 0, 1, 2, 3, 4 or more. To determine if the discrepancy between the observed and predicted rates of reconviction remains after adjusting for the number of prior cautions, this variable was included as an additional explanatory variable in the official juvenile GRAM.

Results

The mean number of prior cautions was higher for the 2006-07 cohort (mean = 1.58) than for the 2004-05 cohort (mean = 1.37; Poisson regression coefficient for cohort $p < .001$). Even after adjusting for the explanatory variables in the official juvenile GRAM, the mean number of prior cautions remained higher for the 2006-07 cohort (mean = 1.58) than for the 2004-05 cohort (mean = 1.37; Poisson regression coefficient for cohort $p < .001$). This finding is consistent with the fact that cautions were not an option for part of the criminal history of offenders in the 2004-05 cohort.

The number of prior cautions was related to reconviction for both cohorts, with reconviction rates increasing with number of prior cautions (chi-square tests of association both $p < .001$). Table 3 shows the observed and predicted rates of reconviction for the 2006-07 cohort where number of prior cautions was included as an additional explanatory variable to the official juvenile GRAM.[8] The inclusion of a control for the number of prior cautions reduced the discrepancy between the observed and predicted reconviction rate to 2.2 percentage points (95% confidence interval 0.1 to 4.3). In other words, it reduced the discrepancy between predicted and observed reconviction rates by 1.1 percentage points compared to what was found with the official juvenile GRAM.[9] Therefore, adjusting for the number of cautions prior to the index appearance reduces, but does not completely remove, the discrepancy between the observed and predicted rates of reconviction.

(b) Are the weights in GRAM changing over time?

The weights in GRAM are crucial because they determine the influence of each control factor on the risk of reconviction. In using GRAM to estimate risk of reconviction, it is assumed that these weights do not change from one year to the next.

Table 3. Observed and predicted rates of reconviction using GRAM with number of prior cautions as an additional explanatory variable (n=4,368)

Cohort	Observed[a] (95% confidence interval)	Predicted (95% confidence interval)	Difference between observed and predicted (95% confidence interval)	Significant increase in reconviction from 2004-05 to 2006-07?
2006-07	57.9 (56.5, 59.4)	55.7 (54.2, 57.2)	2.2 (0.1, 4.3)	Yes

[a] These are the same as the official GRAM as changing the model only affects the predicted rate of reconviction.

Method

To test whether the effects of offender and offence characteristics on reconviction have changed over time, data from both cohorts (2004-05 and 2006-07) were combined in a logistic regression model predicting reconviction. A 'cohort' term was included in the model. The model included main effects for each of the official GRAM explanatory variables, a main effect for cohort and an interaction effect between cohort and each of the official GRAM explanatory variables. The interaction effects were included to test whether the influence of each variable differed between 2004-05 and 2006-07.

To determine whether the discrepancy between the observed and predicted rates of reconviction varied, juvenile GRAM was run separately for each level of the variable(s) whose impact on reconviction had changed over time.

Table 4. Interaction effect between cohort and each explanatory variable in the official juvenile GRAM (n=8,593)

Interaction with cohort	*p*-value of interaction effect
Sex	.626
Indigenous status	.471
Age	.250
Jurisdiction of the index appearance	.051
Principal offence type at the index appearance	.453
Number of convictions in the eight years prior to the index appearance	.757

Results

Table 4 shows the Wald chi-square statistic *p*-values for the interaction effects between cohort (2004-05 or 2006-07) and each of the official juvenile GRAM explanatory variables. The p-value for the interaction between cohort and jurisdiction of the index appearance was .051, marginally greater than the conventional .05, raising the possibility that the impact of jurisdiction on reconviction has changed over time. The 2004-05 cohort of juveniles who completed a YJC outcome plan had lower odds of reconviction than those whose matter was finalised at Children's Court (odds ratio 0.68, 95% confidence interval 0.57 to 0.80, $p < .001$). In contrast, the 2006-07 cohort of juveniles who completed a YJC outcome plan had similar odds of reconviction compared to those whose matter was finalised at Children's Court (odds ratio 0.86, 95% confidence interval 0.73 to 1.02, $p = .075$). As suspected, based on the *p*-value of the interaction effect between cohort and jurisdiction, the impact of jurisdiction on reconviction has changed over time, with the odds of reconviction no longer different across jurisdictions in the later cohort.

For the 2006-07 cohort, offenders attending YJCs no longer have a lower risk of reconviction than comparable offenders dealt with in the Children's Court. This result suggests that the official juvenile GRAM will underestimate the predicted rate of reconviction for juveniles who attended a YJC and overestimate the predicted rate of reconviction for juveniles who attended Children's Court. For each jurisdiction, Table 5 shows the observed and predicted rates of reconviction using juvenile GRAM with jurisdiction excluded as an explanatory variable. From 2004-05 to 2006-07, the rate of reconviction increased for juveniles who attended a YJC but did not change for juveniles who went to a Children's Court.[10] This presents another possible reason for the discrepancy between the observed and predicted rates of reconviction for the 2006-07 cohort. This issue is discussed further in the following sections.

(c) Have the penalties imposed on juvenile offenders changed over time?

The principal penalty at the index appearance was not included in the official juvenile GRAM. This is because GRAM includes a number of other related variables, such as the type of the principal offence and jurisdiction of the index appearance. However, if penalty is related to the rate of reconviction and there is a difference across cohorts in the principal penalty imposed for the index appearance, this difference may not have been properly adjusted for in the official GRAM and may have had an impact on the discrepancy between the observed and predicted rates of reconviction.

Method

Principal penalty was defined as the most severe penalty given at the index appearance based on the Bureau's penalty hierarchy (NSW Bureau of Crime Statistics and Research, 2008, p.141). Chi-square tests of association were used to determine whether:

- there was a change over time in the proportion of juvenile offenders given a specific principal penalty at their index appearance;
- the principal penalty for the index appearance was related to reconviction for either cohort; and

Table 5. Observed and predicted rates of reconviction for each jurisdiction using GRAM with jurisdiction excluded

Jurisdiction of the index appearance/cohort	N	Observed (95% confidence interval)	Predicted (95% confidence interval)	Difference between observed and predicted (95% confidence interval)	Significant increase in reconviction from 2004-05 to 2006-07?
Children's Court					
2004-05	3,335	55.4 (53.7, 57.1)			
2006-07	3,513	58.3 (56.7, 59.9)	56.2 (54.5, 57.8)	2.1 (-0.2, 4.4)	No
Youth Justice Conference					
2004-05	890	49.1 (45.8, 52.4)			
2006-07	855	56.3 (52.9, 59.5)	48.4 (45.0, 51.7)	7.9 (3.2, 12.6)	Yes

Table 6. Number and percentage of juvenile offenders by principal penalty at the index appearance

	2004-05 cohort (n=4,225)		2006-07 cohort (n=4,368)		Percentage point difference from 2004-05 to 2006-07	*p*-value of difference in percentage points[a]
Penalty	**n**	**Per cent**	**n**	**Per cent**		
Dismissed with caution	766	18.1	784	17.9	-0.2	.827
Bond without supervision	679	16.1	747	17.1	1.0	.199
Fine	545	12.9	501	11.5	-1.4	.043
Supervised bond, probation or suspended sentence	862	20.4	1,069	24.5	4.1	<.001
Youth Justice Conference	890	21.1	855	19.6	-1.5	.086
Other[b]	483	11.4	412	9.4	-2.0	.002

[a] The expected cell count was greater than five for all chi-square tests of association.

[b] This category includes, in order of frequency, community service orders (n=415), probation without supervision (n=349), suspended control orders without supervision (n=57), bonds without conviction (n=33), nominal sentences (n=22), bonds without supervision (n=14) and no conviction recorded (n=5).

- there was a change over time in the proportion of juvenile offenders who were reconvicted within each principal penalty type.

To test for the effect of any change in penalty, a new variable was created combining penalty and jurisdiction (jurisdiction was combined with penalty in examining penalty effects because offenders who attend a YJC receive no penalty). The new variable replaced jurisdiction as an explanatory variable in GRAM. If inclusion of this new variable removes the discrepancy between observed and predicted reconviction rates, there is evidence that changes in penalty may be the reason for the discrepancy.

Results

Table 6 shows the proportion of all juvenile offenders in each cohort given specific principal penalties at their index appearance. From 2004-05 to 2006-07, the proportion of:

- supervised bonds, probation or suspended sentences increased 4.1 percentage points from 20.4 to 24.5;
- fines decreased 1.4 percentage points from 12.9 to 11.5; and
- other penalties decreased 2.0 percentage points from 11.4 to 9.4.

Principal penalty was related to reconviction for both cohorts (chi-square tests of association $p < .001$). Table 7 shows the proportion of juvenile offenders who were reconvicted by principal penalty at their index appearance across the cohorts. The reconviction rate was similar for the 2004-05 and 2006-07 cohorts for all penalty types with the exception of dismissed with caution (and YJCs as discussed in the previous section). The rate of reconviction was 5.1 percentage points higher for juvenile offenders who were dismissed with a caution in 2006-07 (reconviction rate = 52.6%) compared to 2004-05 (reconviction rate = 47.5%).

Table 8 shows the observed and predicted rates of reconviction for the 2006-07 cohort where a new penalty/jurisdiction variable replaced jurisdiction in the official juvenile GRAM.[8] The inclusion of the penalty/jurisdiction explanatory variable to the official juvenile GRAM left a 3.2 percentage point gap between observed and predicted reconviction rates (95% confidence interval 1.1 to 5.3). This gap is very similar to the difference found using the official juvenile GRAM (3.3 percentage points, 95% confidence interval 1.2 to 5.3). There is no evidence, then, that adjusting for the principal penalty at the index appearance reduces the difference between the observed and predicted rates of reconviction.

Table 7. Percentage of juvenile offenders who were reconvicted by principal penalty at the index appearance

Penalty	Per cent reconvicted in 2004-05 cohort (n=4,225)	Per cent reconvicted in 2006-07 cohort (n=4,368)	Percentage points difference in reconviction from 2004-05 to 2006-07	*p*-value of difference in percentage points[a]
Dismissed with caution	47.5	52.6	5.1	.048
Bond without supervision	51.8	52.5	0.7	.810
Fine	57.4	58.1	0.7	.831
Supervised bond, probation or suspended sentence	62.5	66.2	3.7	.091
Youth Justice Conference	49.1	56.3	7.2	.003
Other[b]	60.0	59.7	-0.3	.599

[a] The expected cell count was greater than five for all chi-square tests of association.

[b] This category includes, in order of frequency, community service orders, probation without supervision, suspended control orders without supervision, bonds without conviction, nominal sentences, bonds without supervision and no conviction recorded.

Table 8. Observed and predicted rates of reconviction with a new penalty/jurisdiction variable replacing jurisdiction in juvenile GRAM (n=4,368)

Cohort	Observed[a] (95% confidence interval)	Predicted (95% confidence interval)	Difference between observed and predicted (95% confidence interval)	Significant increase in reconviction from 2004-05 to 2006-07?
2006-07	57.9 (56.5, 59.4)	54.7 (53.2, 56.2)	3.2 (1.1, 5.3)	Yes

[a] These are the same as the official GRAM as changing the model only affects the predicted rate of reconviction.

(d) Has offence seriousness at the index appearance changed over time?

Another offence characteristic not included in the official juvenile GRAM is the seriousness of the most serious offence at the index appearance. If there is a difference between cohorts in the seriousness of the most serious offence at the index appearance and if seriousness is related to the rate of reconviction, this difference may not have been properly adjusted for in the official GRAM. This could explain the discrepancy between the observed and predicted rates of reconviction. Analysis will focus on differences within jurisdictions given that in section (b) it was determined that only offenders processed with a YJC have a significant discrepancy between their observed and predicted rates of reconviction.

Method

The seriousness of the most serious offence at the index appearance was assessed using the Median Sentence Ranking (MSR) developed jointly by the NSW Bureau of Crime Statistics and Research and the NSW Judicial Commission (MacKinnell, Poletti, & Holmes, 2010). The MSR used in this bulletin is based on the median sentence given to a first-time offender for each offence type defined by the Australian Standard Offence Classification (ASOC) 1997 - second edition codes (Australian Bureau of Statistics, 2008). Lower rankings indicate more serious offences, with murder having a ranking of one.

The MSR is not normally distributed so a non-parametric test of central tendency, the median two-sample test, was used to assess the difference between cohorts in the seriousness of the index appearance, for all offenders combined and within each jurisdiction of the index appearance.

As a further test of changes in seriousness, the MSR cut-off value indicating the least serious quartile for the 2004-05 cohort[11] was calculated. The proportion of index appearances falling above this cut-off value were compared between cohorts. If the seriousness of the index appearance has increased, a smaller proportion of index appearances should fall within this least serious group in the 2006-07 cohort compared to the 2004-05 cohort. Chi-square tests of association were used to determine whether the proportion of index appearances in the least serious group had changed over time, for the total cohorts and within each index jurisdiction.

To test for the effect of any change in seriousness of the index appearance on the discrepancy between the observed and predicted rates of reconviction, this variable was included as an additional explanatory variable in GRAM. If inclusion of seriousness of the index appearance removes the discrepancy between observed and predicted reconviction rates, there is evidence that changes in seriousness may be the reason for the discrepancy.

Results

Table 9 shows that the median MSR of the most serious offence at the index appearance was similar for the 2006-07 cohort and the 2004-05 cohort across the total cohorts and within each index jurisdiction.

Table 10 shows the proportion of index appearances in the least serious group (MSRs of 86 or more, the least serious quartile of index appearances for the 2004-05 cohort) for each cohort in total and within each index jurisdiction. This proportion significantly increased over time across all offenders and within offenders processed in Children's Court at their index appearance. However, did not significantly change within offenders processed with a YJC. This suggests that the seriousness of the index appearance is decreasing over time for offenders processed at Children's Court but not significantly changing for offenders processed with a YJC.

Table 11 shows the observed and predicted rates of reconviction for the 2006-07 cohort where seriousness of the index appearance (classified as 86 or more, or less than 86) was included as an additional variable in the official juvenile GRAM.[8] The inclusion of this variable in juvenile GRAM left a 3.2 percentage point gap between observed and predicted reconviction rates (95% confidence interval 1.1 to 5.2). This gap is very similar to the difference found using the official juvenile GRAM (3.3 percentage points, 95% confidence interval 1.2 to 5.3). There is no evidence, then, that adjusting for the seriousness of the index appearance reduces the difference between the observed and predicted rates of reconviction.

(e) Has the time taken to finalise cases changed over time?

In the official juvenile GRAM, a re-offence was defined as the first offence after the index appearance with an offence date up to 24 months after the index appearance and finalisation date up to 27 months after the index appearance. Court appearances finalised more than 27 months after the index appearance are not counted. This fixed length of time for finalisation was adopted to ensure equal follow-up periods across cohorts. However, if court delay is reducing over time, more re-offences would be formally counted as reconvictions because they would have been finalised within 27 months of the index appearance. It is possible that court delay could exert some effect on the measured rate of reconviction.

Table 9. Mean and median MSR of the index appearance by index jurisdiction

Jurisdiction of the index appearance	2004-05 cohort			2006-07 cohort			*p*-value of difference in medians
	n	Mean	Median	n	Mean	Median	
Children's Court	3,335	63.9	59.0	3,513	63.9	59.0	.092
Youth Justice Conference	890	58.9	59.0	853[a]	59.7	59.0	.827
Total	4,425	62.9	59.0	4,366	63.1	59.0	.213

[a] The offence type for two offenders was missing and hence the MSR could not be determined.

Table 10. Proportion of index appearances with a MSR of 86 or more (least serious) by index jurisdiction

Jurisdiction of the index appearance	2004-05 cohort		2006-07 cohort		Percentage points difference from 2004-05 to 2006-07	*p*-value of difference in percentages
	n	Per cent	n	Per cent		
Children's Court	3,335	27.0	3,513	29.5	2.5	.022
Youth Justice Conference	890	22.0	853[a]	25.2	3.2	.118
Total	4,225	25.9	4,366	28.7	2.7[b]	.005

[a] The offence type for two offenders was missing and hence the MSR could not be determined.

[b] The difference between the proportion of index appearances in the least serious group across cohorts was calculated prior to rounding and then rounded to one decimal place. That is, proportion in the least serious group in 2006-07 cohort minus the proportion in the least serious group in the 2004-05 cohort = 28.65 – 25.94 = 2.71. This difference value was then rounded to 2.7.

Table 11. Observed and predicted rates of reconviction with the additional explanatory variable MSR of the index appearance in juvenile GRAM (n=4,368)

Cohort	Observed[a] (95% confidence interval)	Predicted (95% confidence interval)	Difference between observed and predicted (95% confidence interval)	Significant increase in reconviction from 2004-05 to 2006-07?
2006-07	57.9 (56.5, 59.4)	54.8 (53.3, 56.2)	3.2[b] (1.1, 5.2)	Yes

[a] These are the same as the official GRAM as changing the model only affects the predicted rate of reconviction.

[b] The difference between the observed and predicted rates of reconviction was calculated prior to rounding these rates to one decimal place. That is, observed - predicted = 57.92 - 54.76 = 3.16. This difference value was then rounded to 3.2.

Method

The number of days from the offence to finalisation of the first re-offence was compared across the cohorts. As is usual for time data, this distribution was skewed to the right and hence a non-parametric test of central tendency, the median two-sample test, was used to assess the difference across cohorts. This test was conducted for the total cohorts and within each jurisdiction of the index appearance.

Results

As shown in Table 12, for the total cohorts, the number of days from offence to finalisation for the first re-offence was greater for the 2006-07 cohort than for the 2004-05 cohort (median two-sample test p = .011). However, separate analyses for each jurisdiction of the index appearance revealed that there was no change in the length of time from offence to finalisation for the first re-offence for offenders who attended a YJC at their index appearance but there was an increase for offenders who attended Children's Court. If anything, in Children's Court, the increase in court delay would bias towards a decrease in reconviction rates. The increased rate of reconviction over time among offenders who attended a YJC for their index appearance was therefore not related to the processing time of the re-offence.

(f) Changes in policing practices?

The analyses so far suggest that two factors may explain the higher than expected juvenile reconviction rate for the 2006-07 cohort:

- the absence in GRAM of any control for the number of prior cautions received by a juvenile offender; and
- a higher than expected rate of reconviction among juveniles dealt with via a YJC.

There are three possible explanations for this latter finding:

- YJCs are becoming less effective over time in reducing juvenile re-offending;
- the threshold for formally proceeding against offenders after a YJC might be decreasing, such that police are more likely to bring proceedings than they once were; and/or
- police might be more proactively targeting young offenders, such as increased enforcement of compliance with justice orders.

It is very difficult to tease apart these effects. However, one way to test the second and third of these possibilities is to examine the profile of re-offences to determine whether they have changed in terms of seriousness or in a way that might suggest changes in policing practices.

Are re-offences becoming less serious over time?

Method

The median two-sample test of central tendency was used to assess the difference between cohorts in the seriousness of the most serious offence at the first reconviction after the index appearance. Lower rankings indicate more serious offences, with murder having a ranking of one. Three separate tests were conducted: for all offenders combined, for offenders processed at the index appearance in Children's Court, and for offenders who attended a YJC at the index appearance.

As a further test of changes in reconviction seriousness, the MSR cut-off value indicating the least serious quartile for the 2004-05 cohort[12] was calculated. The proportion of reconvictions falling above this cut-off value were compared between cohorts. If reconviction seriousness has decreased, a greater proportion of reconvictions should fall within this low seriousness group in the 2006-07 cohort than in the 2004-05 cohort. For each jurisdiction at the index appearance (Children's Court and YJC) and across the total cohorts, chi-square tests of association determined if the proportion of reconvictions with low seriousness had changed over time.

Table 12. Mean and median number of days from offence to finalisation of the first re-offence by index jurisdiction

Jurisdiction of the index appearance	2004-05 cohort			2006-07 cohort			*p*-value of difference in medians
	n[a]	Mean	Median	n[a]	Mean	Median	
Children's Court	1,848	144.0	103.0	2,048	154.5	122.0	.001
Youth Justice Conference	436	146.1	117.0	480	146.7	107.0	.277
Total	2,284	144.4	106.0	2,528	153.0	119.0	.011

[a] One offender from the 2004-05 cohort and two offenders from the 2006-07 cohort had an offence date after their finalisation date and were excluded from analysis.

Table 13. Mean and median MSR of the first reconviction by index jurisdiction

Jurisdiction of the index appearance	2004-05 cohort (n=2,285)			2006-07 cohort (n=2,530)			*p*-value of difference in medians
	n	Mean	Median	n	Mean	Median	
Children's Court	1,848	62.1	59.0	2,049	63.9	60.0	.032
Youth Justice Conference	437	62.4	59.0	481	65.8	61.0	.036
Total	2,285	62.2	59.0	2,530	64.2	60.0	.004

Table 14. Proportion of first reconvictions with a MSR of 86 or more (least serious) by index jurisdiction

Jurisdiction of the index appearance	2004-05 cohort		2006-07 cohort		Percentage points difference from 2004-05 to 2006-07	*p*-value difference in percentages
	n	Per cent	n	Per cent		
Children's Court	1,848	25.0	2,049	27.1	2.1	.129
Youth Justice Conference	437	23.1	481	31.4	8.3	.005
Total	2,285	24.6	2,530	27.9	3.3	.009

Table 15. Proportion of reconvictions by principal re-offence type (ASOC 2-digit code), by index jurisdiction

Principal re-offence: 2-digit ASOC code and description	Children's Court		Youth Justice Conference		Total	
	Per cent for 2004-05 cohort (n=1,848)	Per cent for 2006-07 cohort (n=2,049)	Per cent for 2004-05 cohort (n=437)	Per cent for 2006-07 cohort (n=481)	Per cent for 2004-05 cohort (n=2,285)	Per cent for 2006-07 cohort (n=2,530)
08 Theft and related offences[a]	17.9	17.6	26.5[b]	21.0	19.6	18.3
02 Acts intended to cause injury	17.2	15.5	15.8	14.6	16.9	15.3
14 Road traffic and motor vehicle regulatory offences	16.2	15.6	11.2	13.9	15.3	15.3
13 Public order offences	10.6	10.6	9.2	10.6	10.3	10.6
07 Unlawful entry with intent/ burglary, break and enter	9.4	9.1	12.8	9.4	10.1	9.1
15 Offences against justice procedures	8.7	9.7	**4.6**	**9.8**	**7.9**	**9.7**
12 Property damage and environmental pollution	**6.5**	**8.2**	8.0	10.8	**6.8**	**8.7**
06 Robbery, extortion and related offences	3.9	3.3	2.1	2.3	3.5	3.1
16 Miscellaneous offences	3.2	3.2	2.5	1.9	3.1	3.0
10 Illicit drug offences	**3.1**	**4.6**	2.3	3.1	**3.0**	**4.3**
09 Deception and related offences	1.4	1.2	2.5	2.1	1.6	1.3

[a] The following principal offence types each represented less than one percent of total reconvictions and are not reported in this table: homicide and related offences (ASOC 01), sexual assault and related offences (03), dangerous or negligent acts endangering persons (04), abduction and related offences (05), weapons and explosives offences (11).

[b] Bolding indicates the chi-square test of association was significant at the .05 level, indicating the proportion of reconvictions with this type of ASOC code changed over time.

Results

Table 13 shows that, for each jurisdiction at the index appearance and across the total cohorts, the median seriousness of the first reconviction was less serious for the 2006-07 cohort than for the 2004-05 cohort. While reconviction appears to be increasing for offenders with a YJC for their index appearance, the seriousness of the reconvictions appears to have decreased over time. Note, however, that the seriousness of reconvictions has also decreased over time for offenders whose index appearance was at Children's Court.

Table 14 shows the proportion of first reconvictions in the least serious group (MSR of 86 or more, the least serious quartile for the 2004-05 cohort).[13] This proportion increased over time for offenders processed with a YJC at their index appearance but did not change for offenders processed in Children's Court. This evidence suggests that the seriousness of reconvictions is decreasing for offenders processed with a YJC.

Is the profile of re-offences changing in ways that suggest changes in policing practice?

Method

The offence type for the principal offence at the first reconviction was examined using ASOC codes at the 2-digit level (Australian Bureau of Statistics, 2008). The principal offence is defined as the offence with the most severe penalty based on the Bureau's penalty hierarchy for the principal offence (NSW Bureau of Crime Statistics and Research, 2008, p.141). Chi-square tests of association were used to determine whether there was a change over time in the distribution of principal offence types for the

first reconviction after the index appearance. These tests were conducted separately for the total cohorts, offenders processed at the index appearance in Children's Court and offenders who attended a YJC at the index appearance.

Results

Table 15 shows the proportion of first reconvictions for the 2004-05 and 2006-07 cohorts with each principal re-offence type, using 2-digit ASOC codes broken down by jurisdiction at the index appearance. Among the total cohorts, the proportion of reconvictions for illicit drug offences, property damage and environmental pollution offences, and offences against justice procedures increased over time. Among offenders processed in Children's Court for the index appearance, the proportion of reconvictions for illicit drug, and property damage and environmental pollution offences increased over time. Among offenders who completed an outcome plan for a YJC for the index appearance, the proportion of reconvictions for offences against justice procedures increased over time, while thefts and related offences decreased.

Thus while reconvictions appear to be increasing for offenders processed by way of a YJC for their index appearance, in terms of the proportion of reconvictions represented, only one specific principal offence type, offences against justice procedures, significantly increased over time. However, it should be noted that this group represented only a small proportion of all first reconvictions (4.6 per cent (n=20) of the reconvictions in the 2004-05 cohort and 9.8 per cent (n=47) of the reconvictions in the 2006-07 cohort).

CONCLUSION

The current study found evidence that two factors may explain the discrepancy between the observed and predicted reconviction rates. First, the inclusion of the number of prior cautions received by a juvenile offender, which was absent from GRAM, seemed to reduce the size of the discrepancy between the observed and predicted rates of reconviction. Second, there was a higher than expected rate of reconviction among juveniles dealt with via a YJC that was not apparent for juveniles processed in Children's Court.

The profile of reconvictions was examined and it was determined that for juveniles who completed an outcome plan for a YJC for the index appearance the seriousness of the first re-offence was decreasing over time. Further, the re-offence types which increased in prevalence over time appear to be related to changes in policing practice, with reconvictions that involved offences against justice procedures increasing over time among offenders dealt with by way of a YJC at their index appearance. Based on this evidence, it appears that the discrepancy between the observed and predicted rates of reconviction for offenders dealt with by way of a YJC may be partly attributable to changes in policing practices.

However, one limitation of the current study warrants noting. Some group sizes, especially within the jurisdiction of YJC, were fairly small and there may not have been enough power to detect small to moderate changes over time. For example, the finding of a lack of change over time in relation to some re-offence types may have been different if there was a larger sample size.

The current study is unable to determine whether YJCs are becoming less effective over time in reducing juvenile re-offending. A thorough evaluation of YJCs is required to address that issue. Until a proper evaluation of the efficacy of YJC compared to Children's Court is done we can not make implications about the reliance on alternatives to court, either in direct relation to YJCs or more broadly. Until such an evaluation is conducted it is recommended that the use of GRAM be restricted to young offenders dealt with by way of the Children's Court.

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NOTES

1. The difference between the observed and predicted rates of reconviction was calculated prior to rounding these rates to one decimal place as shown in Table 2. That is, observed - predicted = 57.92 - 54.66 = 3.26. This difference value was then rounded to 3.3.
2. The GRAM used to obtain these results will be discussed in more detail in the next section.
3. Data were not missing for any of the variables included in GRAM.
4. The cautions dismissed under the *Children's (Criminal Proceedings) Act 1987* and the *Young Offenders Act 1997*, which are considered as 'convictions' in the current study, are not the same as the police cautions discussed in section (a).
5. Few re-offenders are missing their re-offence date.
6. The GRAM model presented in the current bulletin and officially used to report on progress towards the state plan of reducing re-offending has the financial year 2004-05 as the base year. In contrast, in the juvenile GRAM development bulletin the base year was 2002 (Smith & Jones, 2008a). Consequently, some of the variables that met the criteria for inclusion in the official GRAM differ from those presented in the development paper (Smith & Jones, 2008a). When the base year was 2002, the variable number of concurrent offences had a Wald chi-square statistic *p*-value for the effect less than .05 (p = .033) and was included in the model. However, when the base year was 2004-05, the variable number of concurrent offences had a Wald chi-square statistic *p*-value for the effect more than .05 (p = .086) and was not included in the model. Further, jurisdiction and index offence

type did not meet the criteria for inclusion in the model when the base year was 2002 but did when the base year was 2004-05. There were also some differences in the definition of who was included in the cohorts that may have affected which variables met the criteria for inclusion in GRAM.

7. The cautions dismissed under the *Children's (Criminal Proceedings) Act 1987* and the *Young Offenders Act 1997*, which are considered as 'convictions' in the current study, are not the same as the police cautions being discussed here.
8. There were no indicators of problems with multicollinearity in the logistic regression model. Parameter estimates remained stable after the inclusion of the additional explanatory variable, standard errors did not appear to be inflated and variance inflation factors estimated with linear regression were less than 2.5 for all indicator variables.
9. A similar result was found when the number of prior cautions and the number of prior convictions were summed into one explanatory variable. The inclusion of the number of prior convictions and cautions as an additional explanatory variable to the official juvenile GRAM revealed a discrepancy between the observed and predicted rates of reconviction of 2.4 percentage points (95% confidence interval 0.3 to 4.5).
10. Similar results were found when the number of prior cautions was included as an additional explanatory variable, with a discrepancy between the observed and predicted rates of reconviction for juveniles who attended a YJC of 5.4 percentage points (95% confidence interval 0.6 to 10.1) and no significant discrepancy for juveniles who went to Children's Court (1.4 percentage point increase, 95% confidence interval -0.9 to 3.7).
11. Index appearances with the most serious offence having a MSR of 86 or more represented approximately the 25th percentile of least serious index appearances for the 2004-05 cohort.
12. Reconvictions with the most serious offence having a MSR of 86 or more represented approximately the 25th percentile of least serious reconvictions for the 2004-05 cohort.
13. The most serious offences at the first reconviction that had a MSR of 86 or more, in order of frequency, were: property damage (not elsewhere classified; n=341), offensive behaviour (n=210), theft from retail premises (n=183), possess illicit drug (n=153), resist or hinder police officer or justice official (n=141), trespass (n=98), offensive language (n=79), breach of bail (n=33) and other (n=30).

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