



The specific deterrent effect of custodial penalties on juvenile re-offending

Don Weatherburn, Sumitra Vignaendra and Andrew McGrath

It is widely assumed that placing offenders (juvenile or adult) in custody acts as a deterrent to further offending. The present study was designed to see whether juvenile offenders who receive a detention sentence are less likely to re-offend, controlling for other factors, than juvenile offenders given some other form of sentence. Two groups of offenders (152 given an detention sentence, 243 given a non-custodial sentence) were interviewed at length about their family life, school performance, association with delinquent peers and substance abuse. They were then followed up to determine what proportion in each group was reconvicted of a further offence. Cox regression was used to model time to reconviction. The study found no significant difference between juveniles given a custodial penalty and those given a non-custodial penalty in the likelihood of reconviction, even after controlling for factors that differ between the two groups.

Keywords: juvenile recidivism, custodial penalty, deterrence, cox regression

INTRODUCTION

On an average day in 2006–07, 941 young people were held in detention across Australia (Australian Institute of Health and Welfare 2008, p. 51). The costs associated with juvenile detention are very high. For example, although only 10.3 percent of the 6,488 juveniles who appeared in the New South Wales (NSW) Children's Court in 2007 were given a control order, 48 per cent of the budget of the NSW Department of Juvenile Justice is spent keeping juvenile offenders in custody.¹

Given the high cost of juvenile detention one would expect to find a large body of Australian research examining its potential benefits. To date, however, surprisingly little research has been conducted into the effect of custodial sentences on juvenile recidivism (re-offending). We know that more than two-thirds of the young people who receive a control order from the NSW Children's Court are convicted² of a

further offence within two years of their custodial order. We do not know what their reconviction rate would have been had they not received a custodial penalty. This study addresses this issue.

DETERRENCE THEORY

Conventional economic theories of crime (e.g. Becker 1968) contend that offenders allocate their time between legitimate and illegitimate activities according to the expected returns (costs and benefits) from each. A number of sociologists, however, have argued that imprisonment actually increases the risk of re-offending. There are three main variants of this argument. The first contends that prison is criminogenic because it provides an environment which reinforces deviant values and which is conducive to the acquisition of new criminal skills (Clemmer 1940; Sykes 1958). The second contends that prison is criminogenic because it stigmatizes offenders (Becker 1963; Braithwaite 1988; Lemert 1951). The third

contends that prison increases the risk of re-offending because it reduces the offender's capacity (on release) to obtain income by legitimate means (Fagan & Freeman 1999).

THE EVIDENCE ON SPECIFIC DETERRENCE

There have been four major reviews of the evidence on deterrence over the last ten years (Doob & Webster 2003; Nagin et al. 1998; 2009; Villettaz, Killias & Zoder 2006) but only the Villettaz et al. (2006) and Nagin et al. (2009) reviews focussed on specific deterrence.

Nagin et al. (2009) observed that most studies on the specific deterrent effects of custodial sanctions find these sanctions have a criminogenic effect. Nonetheless, given the many shortcomings among studies they reviewed, they concluded that 'the jury is still out on ... [custody's] effect on re-offending'. Villettaz et al. (2006) reviewed 27 studies published between 1961 and 2002 that on the

Sherman et al. (1997) scale would be considered to be very reliable (i.e. level 4 and above). Only two obtained evidence favourable to the specific deterrent effect of imprisonment. Ten of the remainder found no effect of imprisonment, four found mixed effects of imprisonment (some statistically non-significant, some favourable to the criminogenic hypothesis) and 11 found evidence uniformly supportive of the criminogenic effect of imprisonment. Five of the studies that found either no effect or a criminogenic effect were randomised controlled trials.

Only two Australian studies have looked at the specific deterrent effect of custodial penalties on juvenile re-offending. Kraus (1974) matched each of 350 juveniles given a non-custodial sanction against a comparable offender given a custodial sanction. Juveniles were matched on year of birth; category of offence; age at time of first offence; number of previous (proven) offences; type of previous proven offence and number of previous custodial sanctions. He found lower rates of re-offending among vehicle thieves who received a custodial penalty but higher rates of offending for those receiving custodial penalties in each other category of offence. Cain (1996) examined reconviction rates amongst a sample of 52,935 juveniles convicted in the NSW Children's Court between 1986 and 1994. He found that juveniles given custodial sentences were more likely to re-offend than juveniles given non-custodial sentences but the study included no controls for prior criminal record or Indigenous status.

THE PRESENT STUDY

The Kraus (1974) and Cain (1996) studies both have limitations. Kraus (1974) made a commendable effort to match juveniles receiving custodial and non-custodial sanctions but was not able to control for a wide range of other factors potentially relevant to penalty choice and risk of re-offending (e.g. school performance, level of parental supervision, race, socioeconomic status). His methods of analysis were also relatively

unsophisticated by modern standards. Cain (1996) used more sophisticated analytical methods and a much larger sample than Kraus (1974) but was similarly restricted in the range of controls he was able to use.

This study seeks to build on the work carried out by Kraus (1974) and Cain (1996) by using more sophisticated methods of analysis than Kraus (1974) and a much wider range of controls than Cain (1996). The question we seek to address is whether, other things being equal, juveniles who receive a custodial penalty are less likely to re-offend than juveniles who receive a non-custodial penalty. The data for the current study were obtained from a longitudinal cohort study of juvenile offenders. A sample of juvenile offenders who received custodial and non-custodial sanctions were surveyed and then followed up to determine whether, after controlling for other factors likely to influence recidivism, juvenile offenders who received control (custody) orders re-offended more quickly than juvenile offenders who received non-custodial sentences.

SURVEY PROCEDURE

The survey took the form of an interview using a written questionnaire comprising 95 closed-ended questions. The questionnaire was designed in large part to test certain theories about the relationship between recidivism and juvenile reactions to the court process (McGrath 2009). Some of the questions included in the questionnaire, are of interest because of their potential relevance as controls. We discuss the variables used in the present study in more detail below.

The interviews took place between 1 December 2004 and 30 June 2007 at Children's Courts and Juvenile Justice Centres in NSW. Most interviews took 15 to 20 minutes to complete. Very few interview participants declined to answer questions despite being given the option to do so. The end of the follow-up period for the study was 1 January 2008, six months after the last study participant was interviewed.

RESPONSE RATE AND SUBJECT ATTRITION

The names and dates of birth of study participants were matched with the NSW Bureau of Crime Statistics and Research re-offending database (ROD) to determine prior criminal history for each study participant³ and instances of post index offence reoffending, if any. Two interviewers carried out the non-custodial interviews. The response rate for one interviewer was 71 per cent. The response rate for the second interviewer was 70 per cent. One interviewer carried out the custodial interviews. The response rate for the custodial group was 93 per cent. Data attrition from various sources (e.g. duplicate interviews, record linkage problems) resulted in the exclusion of a number of cases. The final sample comprised 395 people – 152 on custodial orders at the time of the interview and 243 people on non-custodial orders at the time of the interview.

VARIABLES

The measure of re-offending used in the present study is free time to re-offend, defined as the time between the date of the index court appearance and the date of the next proven offence (i.e. the next offence proved at a court appearance after the index court appearance). The term 'free' is used in this context because in measuring the time to reconviction we have subtracted any time spent in custody between the end of the index sentence and the first proven offence or end of the follow-up period. Information on the dependent variable was obtained from ROD.

In order to isolate the effect of penalty type on juvenile recidivism we need to control for factors associated with the choice of penalty that might also influence risk of re-offending. There is, unfortunately, no consensus on what these factors are. The selection of controls in the present study was guided partly by the meta analysis conducted by Cottle, Leigh and Heilbrun (2001) and partly by exploratory analysis of the dataset used in the current study. The list of factors examined in the current study for potential inclusion in the

multivariate analysis appears in Table 1 below. Appendix 1 shows each variable, along with the method of construction of each factor (where relevant) and the p-value from the bivariate log-rank tests conducted with time to re-offend.

ANALYSIS

The analysis proceeded in two stages. In the first stage, bivariate (log-rank) tests were conducted to see which of the variables listed in Table 1 had an association with time to re-offend at $p < 0.25$. The variables found to have a significant relationship with time to re-offend were then ranked in order of p-value from smallest to largest. In the second stage a series of Cox regression models was constructed. In the first, time to re-offend was regressed against penalty type without controlling for any other factors (unadjusted relationship). In the second, control variables were added to the model one by one, commencing with the variable with the smallest p-value from stage one. The process continued until a control variable was reached that added nothing to the explanatory power of the model (that is, its coefficient was not found to be statistically significant at $p < 0.05$). That variable was then removed and the final model consisted of the custody variable and those variables found to make a significant independent contribution to time to re-offend.

RESULTS

Fifty-two per cent of the sample had a proven offence subsequent to their index sentence during the follow-up period. The mean time to reconviction (for those who were reconvicted) was 163 days (median = 110 days), with a standard deviation of 178 days. Table 2a and 2b contain descriptive statistics for variables found to have a statistically significant relationship with time to re-offend at $p < 0.25$.

Table 3 shows the results of the Cox regression analysis. Two models are shown. Model A gives the unadjusted effect of penalty type on time to reoffend. Model B gives the adjusted effect of penalty type on time to re-offending, after controlling for number of prior court appearances.

Table 1: Factors examined for potential inclusion in the multivariate analysis

Gender	Parental status (sole parent v other)
Race	Parenting style
Socioeconomic status	Level of parental supervision
Age	Association with delinquent peers
Age first contact with the law	School attendance
Prior criminal record	Substance abuse
Number of prior commitments to custody	Geographic mobility
Principal offence	Perceived certainty of arrest
Number of concurrent offences	Perceived stigmatization
Whether a victim of abuse	Whether received a custodial sentence

Table 2a. Descriptive statistics for bivariate predictors of time to re-offend (continuous variables)

<i>Variables</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>
Cigarette consumption in the 12 months prior to the interview	394	5.3	2.7
How long (years) have you been in that situation (i.e. living with the same people respondent is living with now)	214*	16.3	1.8

* This item is restricted to people who have had no other address

Surprising as it may seem, this was the only factor among those listed in Table 1 that remained significant when included in the multivariate analysis with a variable measuring type of penalty imposed.

Table 3 is interpreted as follows. The column labeled β shows the regression coefficient associated with each variable in each model. The column labeled 'SE' shows the standard error associated with the regression coefficient. The column labeled 'p-value' shows the probability of obtaining the observed value of β by chance. P-values less than .05 indicate that the variable in question is exerting a significant effect on time to re-offend. The column labeled 'HR' shows the hazard ratio associated with the variable. A hazard ratio of more than one indicates that the variable in question increases the instantaneous risk of re-offending. A hazard ratio of less than one indicates that the variable in question reduces the instantaneous risk of re-offending. The final columns show the 95 per cent

confidence interval around the estimated hazard ratio.

The first point to note is that the hazard ratio associated with the custody variable in Model A is 1.74, which indicates that, prior to the introduction of controls, juvenile offenders given a custodial sentence are 74 per cent more likely at any given time than those who receive a non-custodial penalty. When prior criminal record is introduced into the model (see Model B) juveniles given a custodial sanction remain more likely to re-offend but the hazard ratio associated with the custody variable falls from 1.74 to 1.33 and is no longer statistically significant.

Figures (A) and (B) illustrate this effect. The X-axis in each figure shows free time since the index court appearance. The Y-axis shows the proportion of offenders in each group who have not yet been reconvicted of a further offence. Figure A shows the unadjusted difference in time to re-offend between the custody and

Table 2b: Descriptive statistics for bi-variate predictors of time to re-offend (discrete variables)

<i>Discrete Variables</i>		N	%
Whether on custodial or non-custodial order at time of interview	Custodial	152	38.5
	Non-custodial	243	61.5
Age at first conviction (in years)	10-13	79	20
	14-15	170	43
	16 and over	146	37
Age group (at index court appearance)	13-16	209	51.9
	17	117	29.6
	18 +	73	18.5
Number of prior court appearances	0	126	31.9
	1 or more	269	68.1
Number of prior proven offences	0	164	41.5
	1 or more	231	58.5
Number of prior supervised orders	0	235	59.5
	1 or more	160	40.5
Number of prior custodial episodes	0	335	84.8
	1 or more	60	15.2
Number of concurrent offences	1	138	35
	2 or more	257	65
Offence type (using ASOC descriptions)	Violent	171	43.3
	Property	136	34.4
	Other	88	22.3
Sex	Female	69	17.5
	Male	326	82.5
ATSI Status	ATSI	95	24.1
	Non-ATSI	299	75.9
	Missing value	1	
Whether living with single parent	Yes	164	59.2
	No	113	40.8
	Missing values	118	
Do parents know where young person is when young person is away from home?	Never	96	24.9
	Sometimes/often/always	290	75.1
	Missing values	9	
What would parent do if caught young person taking cannabis?	Nothing	88	22.7
	Discuss/scold/punish	299	77.3
	Missing values	8	
Do parents chop and change the rules?	Never	255	66.2
	Sometimes/often/always	130	33.8
	Missing values	10	
Do parents know what the young person thinks and feels?	Never	110	28.6
	Sometimes/often/always	275	71.4
	Missing values	10	
How often does young person hang out with friends who have been in trouble with the police?	Never	66	16.8
	Sometimes/often/always	328	83.2
	Missing values	1	
How many of young person's friends have shoplifted or stolen?	None	95	24.1
	One or more	299	75.9
	Missing	1	
How many of young person's friends have used illegal drugs?	None	103	26.2
	One or more	290	73.8
	Missing	2	
How many of young person's friends have been in trouble with the police?	None	31	7.9
	One or more	363	92.1
	Missing	1	
How often have you been/were you suspended at school?	Never	63	16
	Sometimes/often/always	330	84
	Missing values	2	
How often have you wagged/did you wag at school?	Never	87	22.1
	Sometimes/often/always	306	77.9
	Missing value	2	
Alcohol consumption at last sitting	2-5 drinks over the maximum standard recommended amount per day	108	45.8
	6 or more drinks over the maximum standard recommended amount per day	128	54.2
	Missing values	159	
Frequency of alcohol consumption over the maximum standard amount per day in the 12 months prior to the interview	At least 1 day/week	157	39.9
	2-3 days/month or less	237	60.1
	Missing values	1	
Young person's perception of their likelihood of being caught by the police if they commit crime in the future	Very unlikely/unlikely	165	41.8
	Very likely/Likely	230	58.2

Table 3: Effect of custody on time to re-offend (unadjusted and adjusted estimates)

Model	Variables	β	SE	p-value	HR	95% HR CI
A (unadjusted)	Custody v non-custody	0.55	0.15	<0.01	1.74	1.29 2.33
B (adjusted)	1 or more prior court appearance v none	0.61	0.16	<0.01	1.85	1.35 2.52
	Custody v non-custody	0.29	0.16	0.08	1.33	0.97 1.84

non-custody groups. Figure B shows the adjusted difference. It can be seen from Figure A that, prior to controlling for previous court appearances, the survival (non-reconviction) rate in the custodial group is substantially lower than the survival rate in the non-custodial group throughout the follow up period. The same pattern appears in Figure (B) but the differences between the groups are obviously much smaller.

CONCLUSION

The present results suggest that, other things being equal, juveniles given custodial orders are no less likely to re-offend than juveniles given non-custodial orders. Our results are inconsistent with the two previous Australian studies of specific deterrence, both of which found evidence that juveniles given custodial penalties are more likely to re-offend. The difference in findings is probably due to the fact that the present study had better controls for prior criminal record.

The finding that prison exerts no specific deterrent effect is consistent with overseas evidence on the specific deterrent effect of custodial penalties reviewed earlier in this article. It is important to bear in mind, nonetheless, that the long-term effects of custodial penalties might be quite different to their short-term effects. Fagan and Freeman (1999), for example, using data from a national panel study of 5,332 randomly selected youths, found that incarceration produced a significant negative effect on future employment prospects, even after adjusting for the simultaneous effects of race, human capital and intelligence. There have been no studies of the effect of juvenile detention on juvenile employment prospects in Australia but Hunter and Borland (1999) examined the effect of an arrest record on Indigenous employment prospects using data from the 1994 National Aboriginal and Torres Strait Islander Survey. Controlling for age, years completed at high school, post-school qualifications, whether the respondent had difficulty speaking English, alcohol consumption and

Figure A: Proportion not reconvicted by free time since index court appearance (Model A)

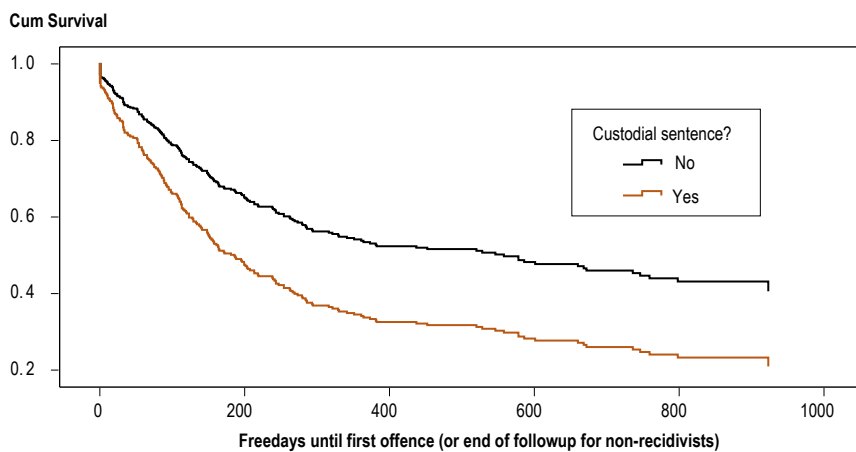
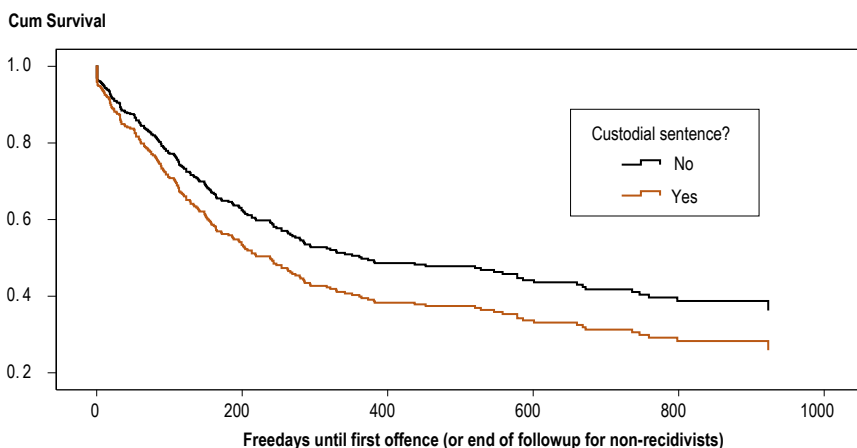


Figure B: Proportion not reconvicted by free time since index court appearance (Model B)



whether the respondent was a member of the 'stolen generation', they found that an arrest record reduced Indigenous employment for males and females by 18.3 and 13.1 percentage points, respectively. On this basis Hunter and Borland (1999) estimated that differences in arrest rates for Indigenous and non-Indigenous Australians might explain about 15 per cent of the difference in levels of employment between these two groups.

These findings and the absence of strong evidence that custodial penalties act as a specific deterrent for juvenile offending suggest that custodial penalties ought to be used very sparingly with juvenile offenders. Fortunately, a range of non-custodial programs now exist which have been shown to be very effective in reducing juvenile recidivism. In the United States, they have also been found to be considerably less expensive than a custodial sentence (Aos, Miller & Drake 2006). Western Australia and New South Wales are currently trialing an intensive supervision program (ISP) known in the United States as multi-systemic therapy (MST). The NSW Bureau of Crime Statistics and Research is currently evaluating ISP. It will be very interesting to see whether it proves as effective here as it has been in the United States (MacKenzie 2002).

ACKNOWLEDGEMENTS

This study was funded by the Criminology Research Council.

NOTES

1. Personal communication, Mr Eric Heller, Manager, Research & Information Development, Research, Planning & Evaluation, NSW Department of Juvenile Justice.
2. For the purposes of this bulletin, the word "conviction" when used in relation to NSW sentencing encompasses all proven offences, including dismissals under s.10(1) and s.10(2)(a) of Crimes (Sentencing Procedure) Act 1999 and all penalties mentioned under s.33 of

the Children (Criminal Proceedings) Act 1987.

3. In ROD, prior criminal history in the form of prior Children's Court sentences was obtained from the NSW Department of Juvenile Justice Children's Court Information System until January 2006. For further information about ROD, see Hua & Fitzgerald (2006)
4. This item is restricted to people who have had no other address

REFERENCES

- Aos, S, Miller, M & Drake, E 2006, *Evidence-based public policy options to reduce future prison construction, criminal justice costs, and crime rates*. Washington State Institute of Public Policy, Olympia, Washington.
- Australian Institute of Health and Welfare 2008, *Juvenile Justice in Australia 2006/7*, Australian Institute of Health and Welfare, Canberra.
- Becker, GS 1968, Crime and punishment: an economic approach. *Journal of Political Economy* vol. 76, pp. 169-217.
- Becker, HS 1963, *Outsiders – studies in the sociology of deviance*, Free Press of Glencoe. New York.
- Braithwaite, J 1988, *Crime, shame and reintegration*, Cambridge University Press, Cambridge, UK.
- Cain, M 1996, *Recidivism of juvenile offenders in New South Wales*, NSW Department of Juvenile Justice, Sydney.
- Clemmer, D 1940, *The prison community*, Christopher: New York.
- Cottle, CC, Lee, RJ & Heilbrun, K 2001, The prediction of criminal recidivism in juveniles: a meta-analysis, *Criminal Justice and Behaviour*, vol. 28, no. 3, pp. 367-394.
- Doob, A & Webster, C 2003, Sentence severity and crime: accepting the null hypothesis. In *Crime and Justice: An Annual Review of Research*, vol. 30, M Tonry (ed.), The University of Chicago Press, Chicago.
- Fagan, J. & Freeman, R.B., 1999, Crime and Work, in M Tonry (ed.), *Crime and Justice: An Annual Review of Research*, vol. 25, University of Chicago Press, Chicago, pp. 225-290.
- Hua, J & Fitzgerald, J 2006, Matching court records to measure re-offending, *Crime and Justice Bulletin* 95, NSW Bureau of Crime Statistics and Research, Sydney.
- Hunter, B & Borland, J 1999, Does crime affect employment status? The case of indigenous Australians. *Economica*, vol. 67, no. 1, pp. 123-144.
- Kraus, J 1974, A comparison of corrective effects of probation and detention on male juvenile offenders, *British Journal of Criminology*, vol. 49, pp. 49-62.
- Lemert, EM 1951, *Social pathology*, McGraw-Hill, New York.
- MacKenzie, DL 2002, Reducing the criminal activities of known offenders and delinquents. In *Evidence-based crime prevention*, LW Sherman, DP, Farrington, BC Walsh & DL MacKenzie, (eds). Routledge, London, pp. 330-404.
- McGrath, A 2009, Offenders' perceptions of the sentencing process: a study of deterrence and stigmatization in the New South Wales Local Court, *Australian and New Zealand Journal of Criminology*, vol. 42(1), pp. 24-46.
- Nagin, D, Cullen, F, and Jonson, C 2009, (forthcoming) Imprisonment and reoffending. In M Tonry, ed., *Crime and Justice: An Annual Review of Research* (vol. 38). Chicago: University of Chicago Press.
- Sherman, L, Gottfredson, D, MacKenzie, DL, Eck, J, Reuter, P & Bushway, S 1997, *Preventing crime: what works, what doesn't, what's promising*, National Institute of Justice, Washington DC.
- Sykes, G 1958, *Society of captives: a study of a maximum security prison*. Princeton University Press, Princeton, NJ.
- Villetta, P, Killias, M & Zoder, I 2006, *The effects of custodial vs non-custodial sentences on re-offending*, Report to the Campbell Collaboration Crime and Justice Group, Institute of Criminology and Criminal Law, University of Lausanne, Switzerland.

Appendix 1: Factors examined for potential inclusion in the multivariate analysis and their relationship with time to reoffend

Variable/Factor	Measure	Relationship with time to reoffend (Dependent Variable) p-value
Gender	Sex – Q36 of Questionnaire	0.0763
Race	ATSI Status Q37 of Questionnaire	0.0002*
Socioeconomic status	SEIFA Australian decile ranking	0.7577
	Household crowding – compute Q66 and Q67 of Questionnaire	0.8639
Age	Interview date minus DOB and regrouped into 3 groups: 10-15; 16-17; 18 and over	0.2421
Age at first contact with the law	The Age at time of first proven offence (either a prior offence or a reference offence) – from ROD regrouped into three groups: 10-13; 14-15; 16 and over	0.0043
Prior criminal record	Number prior court appearances – grouped into ‘none’ and ‘one or more’– from ROD	<0.0001*
	Number prior proven offences – grouped into ‘none’ and ‘one or more’– from ROD	<0.0001*
	Number prior supervision orders – grouped into ‘none’ and ‘one or more’ – from ROD	<0.0001*
Number of prior commitments	Number prior custodial episodes – grouped into ‘none’ and ‘one or more’– from ROD	0.0010*
Number of concurrent offences	Number concurrent offences (including principal offence)– grouped into ‘one’ and ‘two or more’ – from ROD	0.0208*
Type of crime at index court appearance	Offence Type, created from four-digit Australian Standard Offence Classification (ASOC) descriptions of offences in ROD and grouped into three groups: violence; property and other	0.0644
Victim of abuse	Q57 from Questionnaire – Do your parents punish you by slapping or hitting you? – grouped into ‘never’ and ‘sometimes/often/always’	0.6460
Single parent	Compare Options 1 (both parents) with Options 2&3 (one parent) from Q43 of Questionnaire – Who are you currently living with?	0.0903
Parenting	Do parents congratulate and encourage (Q58) – grouped into ‘never’ and ‘sometimes/often/always’	0.2601
	Are parent/s aware of what their child thinks and feels? (Q61) – regrouped into ‘never’ and ‘sometimes/often/always’	0.1538
	How close does young person feel to parents (Q63) – regrouped into ‘not close at all’ and ‘quite close’ / ‘close’ / ‘very close’	0.7784
	When parents make up rules do they explain them to young person (Q52) – regrouped into ‘never’ and ‘sometimes/often/always’	0.7083
	Does young person think that the rules that their parents make up are fair (Q56) – regrouped into ‘never’ and ‘sometimes/often/always’	0.5146
	Does young person think that their parents chop and change the rules (Q59) – regrouped into ‘never’ and ‘sometimes/often/always’	0.1423
	Do parents follow through on their rules? (Q60) – regrouped into ‘never’ and ‘sometimes/often/always’	0.3275
	Do parents nag young person about little things (Q62) – regrouped into ‘never’ and ‘sometimes/often/always’	0.3306
	How well does young person get on with their mother? (Q46) – regrouped into ‘badly’ and ‘okay/well/very well’	0.6740
	How well does young person get on with their father? (Q47) – regrouped into ‘badly’ and ‘okay/well/very well’	0.4438
	Does young person feel rejected by parents (Q51) – regrouped into ‘never’ and ‘sometimes/often/always’	0.6523
	What would parents do if they found out young person had destroyed or damaged property on purpose (Q53) – regrouped into ‘nothing’ and ‘discuss seriously/scold not punish/punish’	0.6140
	What would parents do if they found out young person was using cannabis (Q54) – regrouped into ‘nothing’ and ‘discuss seriously/scold not punish/punish’	<0.0001

Appendix 1: Factors examined for potential inclusion in the multivariate analysis and their relationship with time to reoffend

<i>Variable/Factor</i>	<i>Measure</i>	<i>Relationship with time to reoffend (Dependent Variable) p-value</i>
Parenting (cont'd)	What would parents do if they found out young person had taken something from a store (Q55) – regrouped into ‘nothing’ and ‘discuss seriously/scold not punish/punish’	0.8782
	How well do parents get along? (Q45) – regrouped into ‘badly’ and ‘okay/well/very well’	0.9970
	Do parents argue or fight in front of young person (Q48) – regrouped into ‘not at all’ and ‘a bit/quite a bit/a lot’	0.9846
Supervision	Do parents know where young person is when young person is out of house? (Q49) – regrouped into ‘never’ and ‘sometimes/often/always’	<0.0001
	Do parents know who young person is with when young person is out of house? (Q50) – regrouped into ‘never’ and ‘sometimes/often/always’	0.4740
Delinquent peers	How many of young persons friends had been in trouble with the police – regrouped into ‘one’ and ‘more than one’	0.0499
	How many of young persons friends had shoplifted or stolen – regrouped into ‘one’ and ‘more than one’	0.1228
	How many of young persons friends had vandalised – regrouped into ‘one’ and ‘more than one’	0.3331
	How many of young persons friends had drunk alcohol under age – regrouped into ‘one’ and ‘more than one’	0.9624
	How many of young persons friends had used illegal drugs – regrouped into ‘one’ and ‘more than one’	0.2197
	How often did young person hang out with friends who had been in trouble with the police – ‘never’ and ‘sometimes/often/all the time’	0.0068
	Q72/78 of Questionnaire – How often do/did you wag? – grouped into ‘never’ and ‘sometimes/often/always’	0.0161
School attendance	Q73/79 of Questionnaire – How often have you been/were you suspended? – Grouped into ‘never’ and ‘sometimes/often/always’	0.2177
Substance abuse	Alcohol consumption – Q85/87 of Questionnaire – regrouped into ‘’ and ‘’	<0.0001
	Alcohol consumption frequency – Q86/88 of Questionnaire – regrouped into ‘at least one day/week’ and ‘2-3 days/month or less’	<0.0001*
	Monthly cigarette consumption – Q89 of Questionnaire	0.7188
	Yearly cigarette consumption – Q89 of Questionnaire	0.2208
	Monthly illicit drug consumption – Q90, Q91, Q92, Q93 of Questionnaire	0.2237
	Yearly illicit drug consumption – Q90, Q91, Q92, Q93 of Questionnaire	0.0262*
	Have you ever injected drugs – Q94 of Questionnaire	0.4604
Change of address	Q65 of Questionnaire – How many times have you moved in your life?	0.7835
	Q44 of Questionnaire – How long have you lived in that situation (in days and excluding “whole life”)	0.7708
	Q44 of Questionnaire – How long have you lived in that situation (“whole life”)	0.2363
Certainty of arrest Court stigmatisation	Q2 of Questionnaire – If you commit a crime in the future how likely is it that you will be caught by the police?	0.0037
	Sum of Q22, Q23, Q24 Q25, Q28 and Q29 of Questionnaire	0.5130
Custodial sentence	Identified in advance of interviews during sentencing at court (yes/no)	0.0003*