

Exploring the causes and consequences of the Australian crime decline: a comparative analysis of the criminal trajectories of two NSW birth cohorts

Jason Payne
Rick Brown
Roderic Broadhurst

Report to the Criminology Research Advisory Council
Grant: CRG 50/14-15

June 2018

Contents

Executive Summary.....	6
Introduction	9
Literature review	10
The international 'crime-decline'	10
The Australian experience of the 'crime-decline'	10
Explaining the 'crime-decline'	10
Social explanations.....	10
Economic explanations	12
Criminal justice system explanations.....	13
Environmental explanations	14
Summing up explanations for the crime drop	15
The 'crime-decline' through a developmental lens	15
Relevance of developmental and life course criminology	17
Research questions	18
Methodology	19
Research design	19
Data	19
Counting rules	19
Analytical method	19
Limitations	20
Results.....	21
Prevalence.....	21
Frequency	24
Chronicity	29
Age of onset	32
Gender	34
Indigenous offenders	37
Trajectories of offending.....	41
1984 Trajectories	41
1994 Trajectories	43
Comparative analysis	45

Conclusion.....	49
Decline in volume, but increase in apparent chronicity	50
Increase in criminal justice breaches	50
Indigenous.....	50
Concluding remarks	50
References.....	52
Appendix A: Detailed Tables.....	56

List of Figures

Figure 1: Annual prevalence of offending (% of cohort by age, 1984 and 1994)	21
Figure 2: Cumulative prevalence of offending (cumulative % of cohort by age, 1984 and 1994)	23
Figure 3: Annual frequency of offending (rate per 100,000 population of cohort by age, 1984 and 1994)	24
Figure 4: Cumulative frequency of offending (cumulative rate of offending per 100,000 individuals in cohort by age, 1984 and 1994)	25
Figure 5: Concentration of offending (cohort by age, 1984 and 1994)	27
Figure 6: Cumulative prevalence of offending by age (Males, 1984 and 1994)	34
Figure 7: Cumulative prevalence of offending by age (Females, 1984 and 1994)	35
Figure 8: Prevalence of offending by age (Indigenous, 1984 and 1994)	37
Figure 9: Cumulative prevalence of offending by age (Indigenous, 1984 and 1994)	39
Figure 10: Four-trajectory solution (ZIP: 2,2,2,2) for offenders born in 1984	42
Figure 11: Four-trajectory solution (ZIP: 2,2,2,2) for offenders born in 1994	44
Figure 12: Population prevalence of trajectories (1984 and 1994)	45
Figure 13: Low-rate trajectory, predicted offence counts (1984 and 1994)	46
Figure 14: Adolescent Limited, predicted offence counts (1984 and 1994)	46
Figure 15: Late-onset, predicted offence counts (1984 and 1994)	47
Figure16: High-rate, predicted offence counts (1984 and 1994)	48

List of Tables

Table 1: Annual prevalence of offending at the age of peak offending (19 years) (1984 and 1994) ...	22
Table 2: Cumulative prevalence of offending to 21 years of age (1984 and 1994).....	24
Table 3: Cumulative offence counts to 21 years of age (1984 and 1994)	26
Table 4: Cumulative offence counts to 21 years of age (1984 and 1994)	28
Table 5: Once-off, Low rate and Chronic Offenders by age 21 (proportion of population and proportion of offenders) (1984 and 1994)	29
Table 6: Once-off, Moderate and Chronic Offenders by age 21 (average offence rate and proportion of offences) (1984 and 1994).....	30
Table 7: Average offence rate and proportion of offences committed by chronic offenders (5+) (1984 and 1994)	31
Table 8: Age of onset by number of offences (1984 and 1994)	32
Table 9: Offence type at age of onset (1984 and 1994)	33
Table 10: Offence type at age of onset (Once-off offenders, 1984 and 1994).....	34
Table 11: Cumulative prevalence of offending to 21 years of age (Males, 1984 and 1994)	36
Table 12: Cumulative prevalence of offending to 21 years of age (Females, 1984 and 1994).....	36
Table 13: Prevalence of offending at age 19, by offence type (Indigenous, 1984 and 1994)	38
Table 14: Cumulative prevalence of offending at age 21, by offence type (1984 and 1994).....	40
Table 15: Four-trajectory solution (ZIP: 2,2,2,2) for offenders born in 1984	42
Table 16: Four-trajectory solution (ZIP: 2,2,2,2) for offenders born in 1984	43
Table A1.1: Annual number of unique offenders by offence type and age (1984 and 1994)	56
Table A1.2: Annual number of unique offenders by offence type and age (Males, 1984 and 1994) ..	57
Table A1.3: Annual number of unique offenders by offence type and age (Females, 1984 and 1994)	58
Table A1.4: Annual number of unique offenders by offence type and age (Indigenous offenders, 1984 and 1994)	59
Table A2.1: Cumulative prevalence of offending by offence type and age (1984 and 1994)	60
Table A2.2: Cumulative prevalence of offending by offence type and age (Males, 1984 and 1994) ...	62
Table A2.3: Cumulative prevalence of offending by offence type and age (Females, 1984 and 1994)64	
Table A2.4: Cumulative prevalence of offending by offence type and age (Indigenous offenders, 1984 and 1994)	66
Table A3: Annual number of unique offences by offence type and age (1984 and 1994)	67

Executive Summary

In this study the arrest records of the 1984 and 1994 NSW birth cohorts were obtained using a data matching process facilitated by the NSW Registry of Births Deaths and Marriages and the NSW Bureau of Crime Statistics and Research (BOCSAR). The aim of this research is to examine the possible causes and consequences of the Australian crime decline through a longitudinal and developmental criminological lens. To the authors' knowledge, this is the first such comparative analysis of longitudinal data aimed at exploring the crime decline, and builds on the recent, albeit it aggregated and cross-sectional, analysis both in Australia (Weatherburn et al. 2014) and overseas (Farrell et al. 2015).

Overall, the age-graded longitudinal experiences of the more recent of the two cohorts (born in 1994) confirm the declines previously identified by Weatherburn and Holmes (2013). Specifically, the results presented in this study suggest that as a proportion of each birth cohort the number of young people having contact with the criminal justice system by their 21st birthday had almost halved; down from 9.5 percent for the 1984 birth cohort to 4.8 percent for the 1994 birth cohort. But for the very young ages of between 10 and 13 years, the annualised prevalence of criminal justice contact was markedly lower for those born in 1994, although the analysis shows that these disparities are greatest in the late-teenage and early adulthood years. Importantly, the otherwise non-existent or modest differences in the younger years suggests that for both cohorts the emergence and prevalence of 'early onset' offending was not dissimilar. Instead, the so-called crime decline appears to have been the result of fewer young people having contact with the criminal justice system as teenagers and young adults.

The comparative population prevalence across a range of different aggregated and disaggregated offence types was also examined. Of interest was the extent to which the prevalence of offending had declined more or less for specific offence types. For example, by age 21 there was a:

- 56 percent decline in the population prevalence of property offending – the aggregate crime category with the highest overall decline;
- 49 percent decline in the prevalence of drink-driving offences;
- 42 percent decline in the prevalence of disorder offences; and
- 32 percent decline in the prevalence of overall violent offending.

The decline in the prevalence of overall violent offending was generally consistent for each of the specific sub-categories of violence, including a 29 percent decline in assault (aggravated and unaggravated), a 43 percent decline in robbery, and a 26 percent decline in other violent offending not elsewhere classified. For property offending, the fall in prevalence by age 21 was highest for motor vehicle theft (down 59%) followed by stealing (down 50%) and burglary (down 46%). Drug offending was the crime type that experienced the lowest overall reduction, although population prevalence by age 21 was still 22 percent lower in 1994 than in 1984.

In terms of offending frequency, the average proven offence count for offenders born in 1994 was 34 percent higher than estimated for their peers born 10 years earlier. By offence type, the results indicate that by age 21:

- The average number of violent offences committed was 2.3 and 2.7, respectively – an increase of 14 percent.

- The average number of property offences committed was 3.6 and 4.0 respectively – an increase of nine percent. It is notable that for motor vehicle theft, there was an eight percent decline in the average number of offences per offender.
- The average number of drug offences was 1.6 and 1.6, respectively – equivalent to no change over 10 years.
- The average number of drunk driving offences was 1.1 and 1.1, respectively – equivalent to no change over 10 years.
- The average number of disorder offences was 2.5 and 3.1, respectively – an increase of 24 percent.

Although these data suggest that offenders from the 1994 were more prolific and chronic in their offending, this was not true. Instead the increases seen between 1984 and 1994 have been underpinned by the 'falling out' of a large number once-off or very low frequency offenders, making chronic offenders responsible for a disproportionately greater share of the crimes that were recorded. Examined by classifications of chronicity, the data showed that:

- Once-only offenders comprised 35 percent of the total 1994 offending cohort, down from 41 percent in 1984.
- Low-rate offenders (those detected for between 2 and 4 crimes by age 21) comprised 33 percent of the offending cohort in 1994, down from 36 percent in 1984;
- Chronic offenders (those detected for five or more crimes) represented one in four (23%) of the 1984 offender cohort, though this increased to one in three (32%) of the 1994 offender cohort. In terms of offence counts, these so-called chronic offenders were responsible for 77 percent of all recorded episodes of offending; up from 68 percent for equivalent peers born in 1984.

The age of onset was also examined in these data but showed relatively little change between the 1984 and 1994 cohorts. For example:

- The median age of first offence was 18 years for both cohorts.
- The median age of onset for once-only offenders (19 years), low-rate offenders (18 years) and chronic offenders (15 years) also stayed the same across the two cohorts.
- Although the age of onset didn't change, the nature of first offending did such that property offences were considerably less likely to be indicated as an onset offence (down 22%), with the largest fall seen for motor vehicle theft (down 44%). Making up for the decline was a commensurate increase in violent offending (up 28%), drug offending (up 38%) and disorderly conduct offending (up 14%) as the offence of first contact with the criminal justice system.

By gender and Indigenous status, these data show that the key findings seen at the population level appear to have been experienced equally for young women and for Indigenous people in NSW. In fact, the population prevalence of criminal justice system contact for young Indigenous people in NSW declined more rapidly than for their non-indigenous counterparts - resulting in a 17 percent fall in relative over-representation.

In the final analysis, semi-parametric group based analysis was used to examine how criminal career trajectories have, on average changed through the crime decline. Taking into account the full extent of the longitudinal data to age 21, these comparative analyses suggest that the crime decline has resulted from a large reduction in the number of offenders who have historically had contact with the criminal justice system for only one or a very small number of offences. The key driver of the decline, at least amongst these two birth cohorts, has been change in the prevalence of contact rather than a change in the relative frequency of offending amongst chronic offenders. For chronic offenders, two trajectories emerge. The first is the early onset and high-volume offending population who, so it seems, are fewer in number and are offending at lower rates. The second are the late-adolescent high-volume offenders who appear to be greater in number starting their offending one year earlier on average. These shifts suggest that the profile of offending has changed. Whether this is as a consequence of circumstance or purposeful policy intervention is unknown, however the changing nature of these trajectories suggests that the criminal justice system may not only be, in part, responsible for the crime decline, but will also need to adjust in response to its consequences.

Introduction

In their analysis of recent crime trends, Weatherburn and Holmes (2013) make a number of important empirical observations about the NSW experience of the international 'crime-decline'. Specifically, the authors note that between 2000 and 2012, NSW experienced a 50 percent decline in the rate of theft and a 33 percent decline in the rate of robbery – declines for which Clancey and Lulham (2014) estimate have so far produced a saving of \$5.15 billion to the NSW community. Like most other Australian states and territories (ABS Recorded Victims 2013), NSW is currently in the midst of the largest and most protracted decline in crime on record; an experience it shares with New Zealand (Mayhew 2012), Canada (Oimet 2002), the USA (Zimring 2007) and much of Western Europe (Aebi & Linde 2010).

Internationally, a range of explanations have been offered for this decline in crime, although these typically include explanations for changes in violence as well as property crime. As noted by Farrell et al (2010), for example, only some of these theories have been (at best partially) tested. As will be discussed in further detail, these explanations have included (among others) demographic changes (Blumstein 2000), increases in immigration (Wadsworth 2010); increased abortion (Donohue and Levitt 2001), increases in the prison population (Langan and Farrington 1998), changes to policing strategies (Zimring 2012), increases in police numbers (Levitt 2004), changes to gun laws (Duggan 2001), changes to drug markets (Levitt 2004) and reductions in childhood exposure to airborne lead pollution (Wolpaw Reyes 2007).

In NSW and in Australia more broadly, relatively little effort has been made to explore the causes of this phenomenon. In one of the few studies that exist, Moffatt, Weatherburn and Donnelly (2005) argue that the decline in crime can be attributed to a reduction in heroin availability and consumption, an increase in re-registrations for drug treatment, and improvements in local economic conditions. Some years later, Wan and colleagues (2012) found that higher levels of imprisonment, coupled with increases in average levels of income, contributed to a reduction in burglary (but not robbery), while in their most recent examination of NSW data, Weatherburn and Holmes (2013) point to the potential influence of new policing practices, together with a shift in local demographic profiles and improvements in security as possible complimentary explanations for the property crime decline in that state. In a comprehensive review of 17 international hypotheses, Weatherburn et al (2016) most recently concluded that there was evidence to suggest that increasing police numbers, improved economic conditions, declines in heroin use and improved security may each have contributed to the overall decline seen in NSW.

Notwithstanding the diversity of these explanations, there nevertheless remains a paucity of Australian contributions to the international search for causes and correlates of the crime decline. More importantly, there is also a notable absence of significant local and international research on its long-term consequences. To fill this gap, the present study aims to examine the property crime decline in NSW through the lens of developmental and life-course criminology. In doing so, it seeks to compare the developmental trajectories of young offenders from two birth cohorts (1984 and 1994). These specific cohorts have been selected to represent two developmentally and contextually distinct periods in NSW. Born in 1984, the first cohort are members of 'Generation Y' – a group of young people who transitioned through adolescence at a time of sustained year-on-year growth in the rates of drug, property and violent crime. The second cohort are members of 'Generation Z' who, unlike their predecessors, have transitioned through adolescence at a time when crime rates were in decline.

The purpose of this study is to identify whether, in these vastly different contexts, there has been a fundamental shift in the size (proportion of population), shape (age of onset, speed of escalation) and nature (offence types) of the early antisocial and criminal trajectories of young people in NSW.

Literature review

The international 'crime-decline'

The crime decline has been an international phenomenon. In the USA, overall crime began to decline from the late 1980s. Canada, along with some European countries (Finland and the Netherlands) and New Zealand, experienced declines from the early 1990s, while decline in England and Wales began from the mid-1990s. A number of former Communist countries in Europe (Estonia, Poland and Georgia), along with Sweden experienced sharp reductions in crime after 2000 (van Dijk and Tseloni, 2012).

While the timing and trajectories of the crime decline may have varied between crime types and between countries, the overall pattern has been remarkably similar. Crime declined over a sustained period in North America, Europe and beyond.

The Australian experience of the 'crime-decline'

In Australia, crime began to decline from around the turn of the millennium, although this has largely been focused on property crime, rather than other crime types. For example, between 2001 and 2013 vehicle theft declined by 62 percent, robbery declined by 56 percent and burglary declined by 53 percent. In contrast, the incidence of assault rose by 12 percent between 2001 and 2010 (the last year for which comparable national figures were available) (Australian Institute of Criminology 2012, 2016).

Explaining the 'crime-decline'

With limited Australian material on which to draw, it was necessary to examine the international literature on the crime drop to offer explanations for the decline. The studies examined can broadly be classified into four categories. These include studies associated with social factors, economic factors, criminal justice factors and environmental factors. Social factors refer to general societal changes associated with demographic and lifestyle factors; economic factors were associated with changes in the economy that may affect individuals, in terms of unemployment and income; criminal justice factors related to changes in the system, particularly associated with policing and imprisonment; and environmental factors were those associated with the wider environment in which we live. Each of these are discussed in turn.

Social explanations

Social factors relate primarily to changes in demographic profiles and to changes in activities by a population, such as changing lifestyles and consumption patterns. In this regard, five factors have been associated with the crime drop, including an aging population, increased abortion, increased immigration, changing drug markets and reductions in risky behaviour generally.

Aging population

Offending typically varies with age, peaking in mid to late adolescence, before declining steadily year-on-year (Gottfredson and Hirschi, 1990). It is therefore not unreasonable to assume that changes in the size of an adolescent cohort will affect crime rates. This line of reasoning was used in numerous studies to explain changes in violence (particularly homicide) in the USA in the 1980s and 1990s.

During this period, homicide peaked around 1980, before declining in the early 1980s. It then rose again in the late 1980s, before falling sharply in the 1990s. Initially, a number of studies explained this trend in terms of the baby-boomer generation aging out of crime in the early 1980s, followed by their children reaching the peak age of offending in the late 1980s (Fox, 1978; Blumstein et al, 1980). However, these models proved to be less effective at explaining the decrease in violence from the early 1990s. Fox (2006) estimated that demographics explained about 10 percent of the decline in the USA during the 1990s, similarly Levitt (1999) suggested that changes in the age structure accounted for no more than one percent per year of the fluctuations in crime rates.

Subsequent analyses elsewhere have produced mixed results. Trussler (2012) found some support for a relationship between the homicide rate in Canada and the proportion of the population aged 15 to 29 years. In contrast, Hanslmaier et al (2015) found that the age structure explained little of the variation in crime rates generally in Germany. In the Australian context, Weatherburn et al. (2016) noted that the aging population hypothesis fails to explain the rise in theft and robbery prior to 2001. According to the authors, the ageing population hypothesis should have resulted in decline in violence as well as property offending, given the over representation of young people in such offending, yet violent crime remained stable (Weatherburn et al, 2016).

Increased use of abortion

The legalisation of abortion in the USA in 1973 was hypothesised to reduce crime by reducing the size of the cohort available to commit crime. Moreover, those seeking abortion were more likely to come from lower socio-economic groups, be single parents, teen parents and from African American backgrounds. Children from these background were linked with increased likelihood of offending. Therefore, the decline in the number of potential offenders reaching their peak age of offending was found to coincide with the crime drop in the early 1990s. Donohue and Levitt (2001) estimated that an increase in the abortion rate of 100 per 1000 live births was associated with a reduction of 12 percent in homicide, 13 percent in violent crime and nine percent in property crime. Further, the crime rate was estimated to be 15-25 percent lower in 1997 than it would have been had abortion not been legalised.

The analysis undertaken by Donohue and Levitt (2001) has, however, been criticised by Fox (2006) for its narrow use of the available data, while Blumstein (2006) has noted that age cohorts change slowly from year-to-year and so cannot explain the sharp crime decline in the USA in the 1990s. Zimring's (2007) analysis of birth rates pre / post 1973 indicated that the main decline in birth rates had occurred well before abortion legalisation and, after the legalisation, birth rates rose steadily. These trends suggested that any decline in crime should have happened earlier and have been short-lived. Zimring also showed that birth rates failed to decline among single parents aged 15-19 or among African American parents – the very groups that should have experienced a decline in birth rates. Finally, an analysis of international data failed to find much support for the abortion legalisation hypothesis (Zimring, 2007). In Australia, Weatherburn et al. (2016) noted that the legalisation of abortion should have impacted on violence, as well as property crime, when the former actually remained unchanged. They also noted the timing of the decline does not fit with the timing of abortion legalisation.

Increased immigration

Contrary to social disorganisation theory (Shaw and McKay 1942), there is some evidence from the USA to suggest that increased immigration might be expected to reduce crime. Possible reasons for this include immigrant populations committing less crime than native populations, or immigrant populations living in less crime prone neighbourhoods (Sampson and Bean, 2006; Sampson, 2006). It may also be the result of immigration bolstering two parent families in an area as a mediating factor

on crime (Ousey and Kubrin 2009). Several studies have shown how the decline in violent crime in the USA may have been associated with an increase in immigration. For example, Stowell et al (2009) found that violent crime rates tended to decline in metropolitan areas where immigration became more concentrated. This finding was supported by Wadsworth (2010) who found that while, overall, increased immigration was positively associated with increases in homicide and robbery, cities with the largest increases in immigration between 1990 and 2000 also experienced the largest declines in homicide and robbery.

Changing drug markets

The role of drug markets in explaining the crime drop varies by country. In the USA, declines in violence during the 1990s were related to the maturing and subsequent decline of the crack cocaine market. The sale of crack in the late 1980s had become synonymous with gun crime, especially among young black men and the decline in homicide among this group coincided with the decline of crack sales (Johnson et al. 2006; Levitt, 2004).

In the UK, the increase in property crime in the 1980s and early 1990s and subsequent decline has been associated with changes in heroin and crack use, with the decline tracking the reduction in new users of these drugs (Morgan, 2014). In Australia, Moffatt et al (2005) have highlighted the role played by the heroin shortage in declining property crime rates. Both heroin use and property crime declined following the onset of the heroin shortage. Indeed, they showed that reductions in both burglary and robbery were associated with reductions in non-fatal heroin overdoses (a proxy for heroin use). In addition, the decline in robbery was associated with a decline in cocaine use.

Decline in risky behaviour

Mishra and Lalumiere (2008) have suggested that the reduction in crime is actually part of a wider trend towards reductions in risky behaviour more generally. Reductions in violent crime in the USA and Canada were found to be associated with reductions in motor vehicle accidents, risky sexual behaviour and rates of school drop-out. This suggests that explanations for the crime drop should also take account of these changes in other forms of risky behaviour.

Economic explanations

The role of economic factors in explaining changes in crime rates centre on crime as a rational choice when weighed against alternative opportunities (Becker, 1974). Changes in the economy can influence crime in different ways. For example, reductions in unemployment may increase income available thereby reducing the need for alternative revenue sources and may also reduce the leisure time available for engaging in crime; and increases in wage rates may similarly reduce the need for alternative revenue sources.

Declines in unemployment

The relationship between unemployment and crime has been extensively examined yet has tended to show inconsistent results. Where relationships are identified these tend to be weak (Box, 1987). This was the finding of Chiricos' (1987) review of 63 studies examining the unemployment-crime relationship. While more positive and negative associations were identified, there were significant variations by crime type, period examined and methodology employed.

In relation to the crime drop however, there is some support for unemployment having played a role. Zimring (2007) noted that the unemployment rate in the USA halved between 1991 and 1999 at a time of falling crime rates. Further, Raphael and Winter-Ebmer (2001) calculated that, between 1992 and 1997, 28 percent of the decline in burglary, 82 percent of the decline in larceny, 14 percent of the

decline in auto theft and 14 percent of the decline in robbery could be attributed to the decline in the unemployment rate. Overall, 40% of the decline in property crime was attributed to a reduction in unemployment. In contrast, they found no relationship between unemployment and violent crime.

In the Australian context, Moffatt et al (2005) found a significant association between the number of long term unemployed males aged 15-24 years and incidence of burglary and robbery in New South Wales. A further study by Wan et al (2012) found that unemployment was not significant in explaining property and violent crime once average income was included into the model.

Increases in income

In explaining the decline in violent crime in the USA in the early 1990s, Grogger (2006) noted that the crime decline coincided with an increase in the average hourly wage for 16-24 year old males. It was hypothesised that this may have provided an opportunity for young people previously engaged in crack distribution to find employment as an alternative to illegitimate sources of income.

Stronger evidence can be found in Wan et al (2012) who discovered that increases in income had much larger impacts on both property crime and violent crime than criminal justice measures (such as arrest and imprisonment rates) in a New South Wales based study.

Criminal justice system explanations

Criminal justice related factors have largely focused on changes made to policing and the increased use of imprisonment.

Changes in policing

Changes with policing have focused on increases in police numbers and changes in practice. In explaining the extraordinary reduction in crime in New York from the early 1990s, Zimring (2012) concluded that changes in the size and activities of the police were the only factors that could explain why the decline was larger than in other comparable cities. These changes included a 44% increase in New York Police Department staffing between 1990 and 1999 (with a particularly large increase in those working on narcotics related issues), a shift to tactics that focused on quality of life issues (but which were expected to net serious offenders) and improved resource accountability with the introduction of Compstat (a process for matching police activity with crime patterns – especially serious crime).

Analysis by Roeder et al (2015) suggested that while the increase in police numbers across the USA contributed up to 10 percent of the crime drop, the use of Compstat-style approaches had produced larger dividends. In the cities where Compstat was employed, it was associated with a 13 percent decline in violent crime, 11 percent decline in property crime and a 13 percent decline in homicide.

In Australia, Weatherburn et al (2016) showed that police numbers in NSW rose by about 20 percent in 2002 and 2003 but have remained relative stable for the decade thereafter – the period during which crime had been in decline. The increase in the number of officers earlier in the period of decline might not, alone, be expected to drive crime rates down significantly. To the contrary, increasing police numbers has the potential to increase crime rates as the detention rates for on-the-street, status and disorderly conduct offences increase with the greater police presence. That said, if coupled with the improvements to the quality of the policing activity, this has the potential to increase arrest rate for serious offences, leading to a heightened perception of detection among potential offenders and, consequently, an increase in both general and specific deterrence. Wan et al. (2012), for example, demonstrated how the increased arrest and clearance rate in NSW had reduced both

violent and property crime, presumably as a consequence of both incapacitation and deterrence effects. According to the authors, a one percent increase in the arrest rate was associated with 0.135 percent reduction in property crime and a 0.297 percent reduction in violent crime across NSW.

Increased imprisonment

The role of imprisonment in explaining the crime drop has been extensively examined in the USA, where declines in both property and violent crime coincided with significant increases in the use of imprisonment as a criminal justice sanction (Marvell and Moody, 1994; Spelman, 1994; Donohoe, 2009). Spelman's (2000) analysis of four studies that were considered as methodologically robust found that a one percent increase in the prison population would reduce aggregate crime rates by between 0.16 and 0.31 percent. Further work by Levitt (2004) that examined the impact of imprisonment between 1991 and 2001 concluded that increases in the prison population accounted for a 12 percent reduction in homicide and violent crime and an eight percent reduction in property crime.

Drawing on more recent evidence, Roeder et al (2015) noted the importance of taking into account the diminishing marginal returns associated with imprisonment, with the impact of incarcerating falling as the prison population rises. Their analysis indicated that increased incarceration had no impact on violent crime between 1990 and 2013. Where property crime was concerned, it accounted for approximately 6 percent of the decline between 1990 and 1999 and just 0.2% of the decline between 2000 and 2013. Similar diminishing marginal returns were observed in the USA by Liedka et al. (2006).

Although the role of increasing sentence length as a crime reduction policy has been questioned (Durlauf and Nagin, 2011), in an Australian context, Moffatt et al (2005) found a significant relationship between increasing total time of imprisonment for burglary and the number of burglary offences in NSW. However, a more sophisticated model using NSW data (Wan et al 2012) found no relationship between prison sentence length and rates of property and violent crime. Instead, this study showed that the *rate* of imprisonment was associated with rates of crime. A one percent increase in the rate of imprisonment was estimated to result in a 0.115 reduction in property crime and a 0.170 percent reduction in violent crime.

Environmental explanations

Environmental factors are defined here as those that relate to changes in the wider environment in which individuals reside that may influence their propensity for involvement in crime. Two factors are examined here – the impact of reductions in lead in fuel and increased securitisation.

Reductions in lead in fuel

Exposure to high concentrations of lead as a child resulting from lead in fuel has been linked with increased levels of negative behaviours including impulsivity and aggression (Dietrich et al, 2001). The removal of lead from petrol in the USA in the 1970s was thought to have a significant impact on violent crime in the 1990s, with Wolpaw Reyes (2007) estimating it resulted in a 56% decline in violent crime during this time. As Farrell et al (2010) have noted however, this is likely to have been a USA-specific finding, given the concentration of motor vehicles in that country and the timing of the lead reduction. In Australia, Weatherburn et al (2016) noted that the timing of the lead reductions fit poorly with the observed reductions in property crime. In addition, there has not, at the aggregate level, been the commensurate reduction in aggression that would have been expected from reducing concentrations of lead in the air.

Increased securitisation

Over the past 30 years there has been a significant increase in the prevalence and effectiveness of security, which may have simply increased the effort involved in committing property crime and thereby contributed to the decline in that offence type. Improved security has been particularly highlighted in relation to the reduction in vehicle theft (Brown, 2015b; Farrell et al, 2011a; Farrell et al, 2011b; Farrell and Brown, 2016) and burglary (van Dijk and Vollaard, 2012; Tseloni et al, 2014).

Farrell et al (2011a) have put forward two hypotheses for how securitisation may have reduced crime more generally (and not just property crime). The debut crime hypothesis suggests that improved security particularly influenced the kinds of crimes that young people engage in at the start of a criminal career (such as vehicle theft). By making these types of offence more difficult to commit, improved security has prevented young people from engaging in crime and subsequently going on to commit more serious crime. Drawing on US data, Farrell et al (2015) have shown that, across a variety of offence types, the decline in crime between 1980 and 2010 was greatest among young people. The second hypothesis, the keystone crime hypothesis argues that more serious crime is prevented by focusing on those that are less serious. For example, bank robberies may be prevented because vehicles (for use in the getaway) cannot be stolen, and drug offences may be prevented because offenders are unable to commit property crime (such as burglary) to obtain the cash needed to buy drugs). This hypothesis remains largely untested.

In the Australian context, improved security was the most frequent reason given by police detainees to explain the property crime drop (Brown, 2015a). Further, numerous studies have drawn a connection between improved vehicle security and reductions in vehicle theft in Australia (Farrell et al, 2011a; Kriven and Ziersch, 2007; MM Starrs, 2002; National Motor Vehicle Theft Reduction Council, 2007; Potter and Thomas, 2001).

Summing up explanations for the crime drop

The preceding section highlighted 11 explanations that might be relevant in explaining the crime drop in Australia. Of these theories, there is Australian evidence to support six – changing drug markets, unemployment, income, policing, imprisonment and securitisation. Other theories remain either untested in the Australian context, contextually specific to another country, or discredited in the international literature.

While theories have been tested from a range of perspectives, these have most commonly involved correlational studies that have attempted to explain the variance in a dependent variable with reference to a range of independent variables. Moreover, these have typically (although not exclusively) employed aggregate level data. An approach that has received little attention from a crime decline perspective is the use of developmental criminology, which could offer an alternative lens through which to view the crime drop.

The ‘crime-decline’ through a developmental lens

Developmental and life-course criminology is principally concerned with the manner and process by which individual-level criminal trajectories develop with age. Of the numerous theoretical contributions in this area, Nagin and Paternoster (2001) offer a tripartite classification to include general-static (Gottfredson and Hirschi 1990), general-dynamic (Sampson and Laub 1993; Farrington 2003) and typological theories (Moffitt 1993). Notwithstanding the ongoing scholarly debate about the merits of each approach, these different perspectives nevertheless offer an alternate lens through which the causes, but also the consequences of the crime-decline can be examined.

In their General Theory of Crime, Gottfredson and Hirschi (1990) posit low self-control as the single most important explanation for between-individual differences in antisocial and criminal involvement. Their theory is considered 'general' because it offers just one cause of crime and 'static' because the relative differences between individuals within the population remain constant with age. According to these scholars, low self-control develops early in life and is the consequence of poor parenting, insufficient supervision, and the absence of appropriate models of socialisation. Once developed, low self-control defines an individual's lifelong proclivity to antisocial behaviour, while its manifestation into actual criminal activity is influenced by opportunities and events which typically increase during adolescence and diminish after early adulthood.

From a general-static perspective, the now widely documented decline in crime might have occurred if the causes of population heterogeneity (i.e. differences in self-control across the population) have changed such that proportionally fewer individuals in later population cohorts will have been exposed to the circumstances, environments and experiences that predispose or predict adolescent and adulthood contact with the criminal justice system. For Gottfredson and Hirschi (1990) it is the absence of sufficient parental surveillance, coupled with conflict in the home and school environments which, above all else, predicts the development of low self-control and thus the propensity to engage in crime as an adolescent or adult. From this viewpoint, the crime decline *might* have eventuated if, in Australia and internationally, fewer young people have been (or are being) exposed to the early childhood risk factors which have historically predicted relatively high rates of social failure.

For Sampson and Laub (1993), the cause of crime is similarly 'general' to all offenders, however, the between-individual differences in the propensity to offend can vary with age and in response to other dynamic factors such as unemployment, marriage, divorce and military service, just to name a few. Arguably, Sampson and Laub's theory of informal social control was introduced to describe the process of criminal persistence and desistance and so these authors offer little by way of explaining the early antecedents of criminal development in adolescence. Nevertheless, they place significant weight on the longer-term and cumulative consequences of early adolescent offending and its implications for the foreclosing of prosocial opportunities in early adulthood.

For Sampson and Laub (1993), dynamic theories in developmental criminology argue in favour of a state-dependent relationship between the external causes of crime and the accumulation of social disadvantage which acts to exacerbate future offending. Put simply, negative social experiences can trigger an increase in the propensity to commit crime as prosocial opportunities and behavioural alternatives are foreclosed. The two most often cited dynamic social experiences in adolescence are 'contact with the criminal justice system' and 'drug use'. In the former, it is early contact and formal processing by the criminal justice system that has been shown to predict an escalation and persistence in offending because the experience itself, coupled with the social labels ascribed to juvenile offenders, act as barriers to the development of prosocial relationships and attachments to prosocial institutions. In the latter, although often seen as an analogous antisocial behaviour, drug use may nevertheless result in an increase in the propensity to offend if the use of drugs leads to isolation from school and prosocial peers as well as greater involvement with antisocial networks.

From a developmental perspective, therefore, dynamic theorists might suggest that the crime decline is the result of shifting social opportunities and responses which minimise the foreclosing of future prosocial opportunities. It is no secret that in Australia, informal and formal cautioning procedures have been introduced to limit early contact with the criminal justice system. With the specific intention of reducing the number of young people subject to formal processing, this may help to explain the crime decline as the beneficiaries of these policies transition into adulthood without a prior history of formally recorded juvenile offending.

Finally, like those proposed by Moffitt (1993), typological theories are best described as hybrid approaches which combine both static and dynamic explanations within a multi-dimensional causal framework. Moffitt's (1993) developmental triptych, and her description of the so-called 'life-course persistent' and 'adolescent limited' trajectories, is by far the most well-known of these typological approaches. For the purposes of this research, it is important to recognise that the largest population of offenders within any birth cohort are considered by Moffitt (1993) to be adolescent limited because any contact with the criminal justice system is sporadic, typically opportunistic, and rarely occurs at significant levels beyond early adulthood. In fact, Moffitt (1993) argues that adolescent limited offenders are largely driven by status and motivated by the desire to mimic their life-course persistent peers in an effort to bridge the temporary gap between maturational age and legal status.

For Moffitt (1993) the crime decline is either uni- or multi-factorial. It may be that the circumstances which predict life-course persistent offending (adverse parenting and family environment) are less common. Or, it may be that structural opportunities for offending have changed significantly such that the temporary nature of adolescent limited offending has been disrupted by changing opportunities (crimes becoming hard to commit) or displaced to other forms of less-detectable antisocial behaviour (such as online bullying, for example). Finally, to the extent that some adolescent offending is the consequence of maturational status seeking, how these statuses and their social definitions have changed over time may offer important insights. Lower rates of tobacco and drug use among adults, for example, may shift social perceptions of drug use among adolescents. Similarly, the preponderance and availability of online pornography may offer alternatives to these status seeking antisocial limited offenders.

To be sure, there has been relatively little attention paid to potential for developmental criminology to explain the advent and long term implications for the crime decline. To the knowledge of the authors, only two studies to date have taken this approach to suggest that the crime decline may be explained by a reduction in adolescent limited offending (Weatherburn et al. 2014; Farrell et al., 2015). However, in both cases the authors used aggregate cross-sectional data, which meant it was not possible to determine whether the observed reductions in adolescent offending were due to changes in frequency, prevalence, or a combination of both.

Relevance of developmental and life course criminology

For what is currently known about the crime-decline in Australia, a developmental life-course lens may offer a number of new insights. First, to the extent that newer generations have had different avenues and outlets for antisocial activity (i.e. via internet bullying, access to online pornography, etc.), their contact with the criminal justice system may be less prevalent or less frequent than was the case for earlier generations of young Australians. A significant long-term shift in the size of the 'adolescent limited' population, for example, might help to further explain the apparent downward shift in crime. Further, as fewer adolescent limited offenders have contact with the criminal justice system, the risk markers that differentiate short-term from long-term chronic offending may become more apparent.

Second, the uneven distribution of developmental and criminal trajectories at a geographical resolution may help to explain why crime rates have fallen faster in city and urban areas (see Weatherburn and Homles 2013). As others have shown (Allard et al. 2013), some of the most remote communities can accommodate a disproportionately large number of life-course persistent or chronic offenders whose trajectories may be less influenced by those factors already posited as causes of the crime-decline.

Finally, the vast majority of offenders self-report stealing, petty theft, vandalism and motor vehicle theft as the types of crimes most likely to signal the initiation and escalation of adolescent limited or

life-course persistent offending careers (Makkai and Payne 2003). Further, the onset of dependent-level drug use (specifically heroin) has been shown to significantly increase the rate of escalation and prevent or slow the rate of desistence (Payne 2014). To the extent that the crime-decline has been felt most significantly among these 'signal crimes' (Clancey and Lulham 2014; Weatherburn and Holmes 2013) might suggest that increases in public and private security may have significant long term benefits by reducing opportunities for the initiation and subsequent escalation of adolescent limited offending, thereby reducing the overall pool of young offenders 'ensnared' (Moffitt 1993) into a life-long pattern of offending.

Therefore, drawing on the offender trajectory approach, this study seeks to descriptively examine how the prevalence, frequency and types of offending have changed over a period of 10 years – a period marked by significant changes in aggregate level crime rates for which contemporary analyses have been limited to macro-level explanations. Further, delving into the longitudinal offending patterns of the two cohorts born 10 years apart may help to identify which of the six competing theories for the Australian property crime drop (changing drug markets, unemployment, income, policing, imprisonment and securitisation) have the greatest resonance. In a sense, this approach attempts to articulate crime signatures that may support particular theoretical positions (Eck and Madensen, 2009).

Research questions

Through a developmental lens, the current study is motivated by the search for longitudinal evidence for the causes and consequences of the Australian crime decline. Specifically, this study seeks to answer a number of key questions:

- To what extent is the crime decline a function of a fall in population prevalence (number of people ever contacting the criminal justice system), the frequency of active offending, or both?
- Has the experience of the crime decline been equal for men and women and/or Indigenous and non-Indigenous offenders?
- Are the offence profiles of active offenders different between the two cohorts, and to what extent might changes to these crime signatures shed light on the situational and environmental factors underpinning the crime decline?
- Of those who did offend, have their longitudinal offending trajectories changed in 10 years and what implications might these changes pose for policy and practice?

Methodology

Research design

The principle objective of this research is to examine whether the prevalence, frequency and nature of police contact has changed significantly in the context of the Australian crime decline. We use a longitudinal approach to examine the experience of two birth cohorts (separated by 10 years) and their experiences of police contact during adolescence and early adulthood. Our analysis adds value to the existing research on this topic; research which has almost exclusively relied on the examination of temporal changes using repeated cross-sectional data.

Data

The data for this study represent offence-level unit records for all offences committed and recorded by NSW police for offenders born in one of two NSW birth cohorts (1984 and 1994). Specifically, and consistent with the approach of Hua, Baker and Poynton (2006), the two birth cohorts were identified from the records of the NSW Registry of Births Deaths and Marriages. The names and dates of birth for each person born in that cohort were then cross matched with the Reoffending Database (ROD) maintained by the NSW Bureau of Crime Statistics and Research (BOCSAR). For each individual match, the unit record data were extracted for each offence, together with offence specific details (offence type, date and outcome) and a series of demographic variables (gender and indigenous status).

Counting rules

For the purposes of the present study, criminal offending is defined as a unique 'proven offence'. Proven offences are those recorded by the police and for which there was an official outcome that substantiated the offence. In most cases this is the recording of a formal conviction, however it may also include formal cautions or diversions where the offence is not disputed. All unique offence counts are included in this study, meaning that where an offender is apprehended and charged with multiple counts of the same offence, these are recorded as separate offences. Finally, crime types are coded using the Australian and New Zealand Standard Offence Classification (ANZSOC 2014).

Age-specific and cumulative prevalence rates are calculated relative to the population count in each birth cohort. As extracted from the NSW Registry of Births Deaths and Marriages, these were:

- 83,328 in 1984; and
- 89,373 in 1994

At the time of extraction, it was not possible to identify age-specific population mortality rates, and thus population estimates are treated as constant to age 21. In addition, the NSW Registry of Births Deaths and Marriages was unable to provide population data disaggregated by Indigenous status. Instead, where Indigenous population estimates are used as the denominator, these have been calculated using the Australian Bureau of Statistics Indigenous population projections.

Analytical method

Analysis of these data were conducted in two phases. In the first phase, the data were subject to a series of descriptive analysis techniques, identifying aggregate, population-level similarities and differences between the two cohorts. Analysis was conducted using Stata v.12 (StataCorp 2012).

In the second stage of the analysis, Growth Mixture Modelling (GMM) and Semi-Parametric Group Based Modelling (SPGM) techniques were used to model a series of single trajectory and multiple trajectory solutions to the data. Consistent with Nagin's (2005) description of these group-based methods, the optimal number, shape and size of each trajectory solution were determined using recommended statistical parameters, including the Bayesian Information Criteria (BIC) and the Odds of Correct Classification (OCC). Sensitivity analysis were conducted using bootstrap sampling techniques and a systematic solution search across randomized start values. Both single-cohort and pooled-cohort analysis were conducted.

Once identified, the trajectories of each cohort were compared and contrasted, taking into consideration their estimated size (proportion of the population) shape (age of initiation, and rate of escalation) and offence mix (offence at first contact and overall offence distribution). The GMM and SPGM techniques were implemented using the *traj* module designed for implementation in Stata (Jones and Nagin 2013).

Limitations

A more detailed and comprehensive discussion of the limitations of this study are provided at the conclusion of this report. However, readers are to be reminded that when interpreting these results:

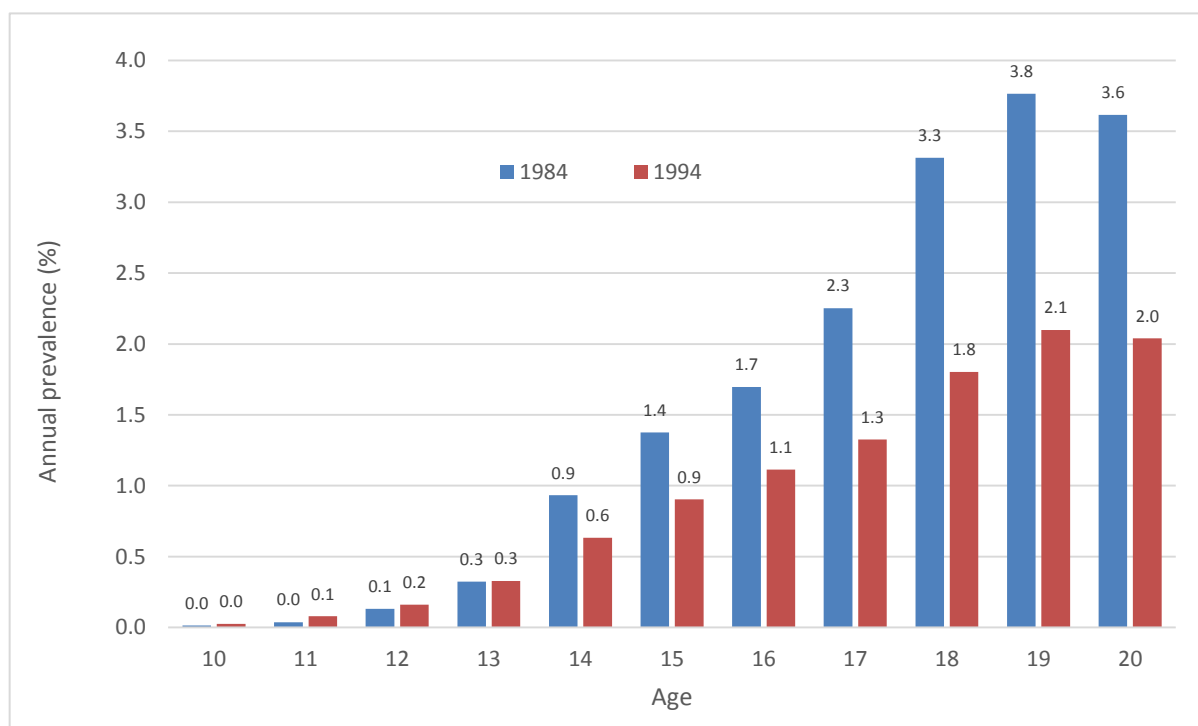
- Mortality rates have not been used to modify the population estimates. As a consequence, the age-specific rates of offending presented herein are likely to be conservative estimates. We have no reason to believe that the age-specific rate of mortality was considerably different between the 1984 and 1994 cohorts, so the under-estimation is likely to affect both cohorts equally.
- These data do not discount the base populations for individuals who move interstate or overseas. Again, these effects are assumed to be small and equal between the two cohorts.
- The crime data used in this study are for recorded offences only. Thus, conclusions can only be drawn about crime that is detected. For reasons described in the conclusion, we believe this might help to explain some of the significant outcomes of this study.

Results

Prevalence

Prevalence, as described here, relates to the proportion of the population that committed a crime for which they were detected and which was recorded on their criminal record. Figure 1 maps the annual population prevalence of offending for each age between 10 and 20 years, inclusive. For both the 1984 and 1994 cohorts, the peak age of offending – the age at which there was the greatest number of offenders – was 19 years. For the 1984 cohort, the peak population prevalence was 3.8 percent. For the 1994 cohort it was 2.1 percent. This indicates that the proportion of the population who committed an offence when they were 19 years old declined by 44% between the two cohorts. The divergence between the two cohorts begins at age 14 where the prevalence of offending was 0.9 percent and 0.6 percent, respectively (a 33% difference). Before age 14, albeit at ages of very low prevalence, both cohorts nevertheless appeared to track along an almost equivalent trajectory. After age 14, the prevalence of offending among the 1994 cohort remains consistently and considerably lower than that of their peers born in 1984.

Figure 1: Annual prevalence of offending (% of cohort by age, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table 1 examines the comparative population prevalence at age 19 across a range of different aggregated and disaggregated offence types. Of particular interest is the extent to which the prevalence of offending had declined for specific offence types, relative to the overall decline of 44 percent. For example, at the equivalent age of 19 years there was a:

- 62 percent decline in the prevalence of property offending – the aggregate crime category with the highest overall decline;
- 56 percent decline in the prevalence of drink-driving offences;
- 51 percent decline in the prevalence of disorder offences; and

- 37 percent decline in the prevalence of overall violent offending.

The decline in the prevalence of overall violent offending was generally consistent for each of the specific sub-categories of violence, including a 40 percent decline in assault (aggravated and unaggravated), a 39 percent decline in robbery, and a 33 percent decline in other violent offending not elsewhere classified. For property offending, the fall in prevalence at age 19 was highest for motor vehicle theft (down 63%) followed by stealing and other property offending (each down by 62%, respectively). Though still a substantial decline (and larger than most other crime types), the fall for burglary was not as great as for other property offences (down 56%).

Inconsistent with the overall downward trend was the prevalence of drug offending (higher by 5% in the 1994 cohort) and breach offending (higher by 52%).

Table 1: Annual prevalence of offending at the age of peak offending (19 years) (1984 and 1994)

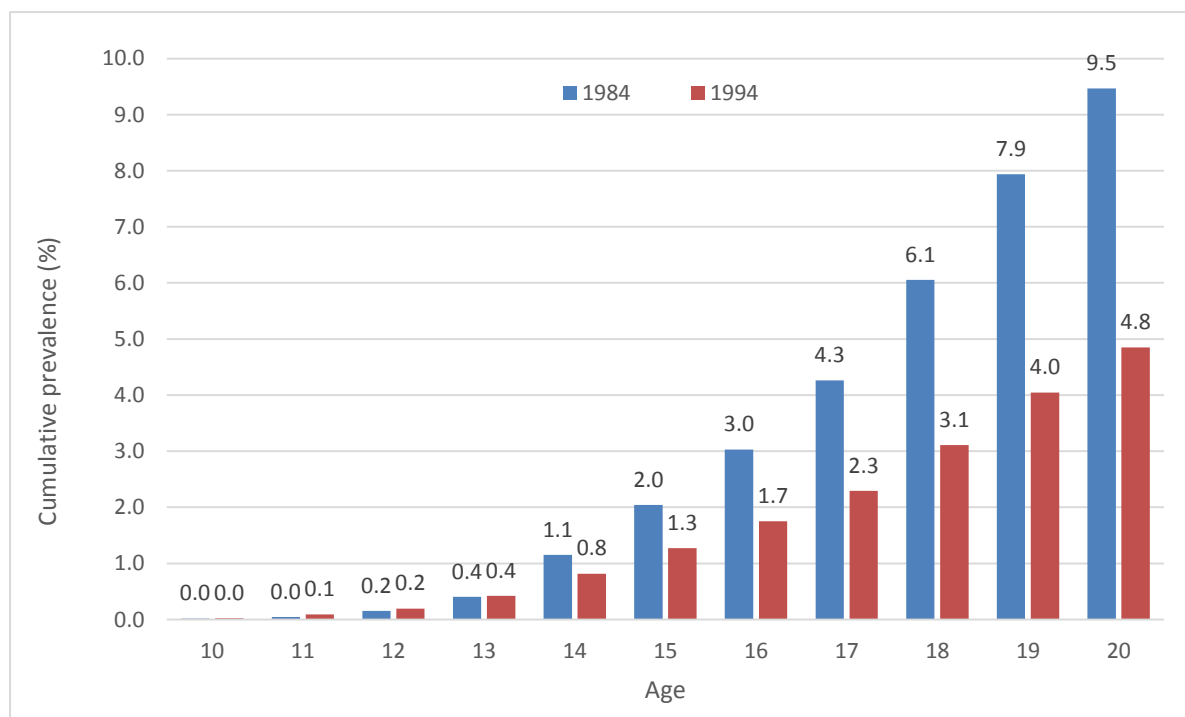
	1984		1994		Summary of change	
	n	%	n	%	% difference in prevalence	% change in prevalence
Violent	602	0.7	409	0.5	-0.3	-36.7
Assault	262	0.3	170	0.2	-0.1	-39.5
Sex	11	0.0	6	0.0	0.0	-
Robbery	44	0.1	29	0.0	0.0	-38.5
Other violent	371	0.4	266	0.3	-0.1	-33.2
Property	792	1.0	324	0.4	-0.6	-61.9
Burglary	172	0.2	82	0.1	-0.1	-55.6
Vehicle theft	107	0.1	43	0.0	-0.1	-62.5
Stealing	379	0.5	156	0.2	-0.3	-61.6
Other property	336	0.4	136	0.2	-0.3	-62.3
Drug	368	0.4	415	0.5	0.0	5.1
Drink driving	792	1.0	374	0.4	-0.5	-56.0
Traffic	796	1.0	554	0.6	-0.3	-35.1
Disorder	836	1.0	441	0.5	-0.5	-50.8
Breach	186	0.2	303	0.3	0.1	51.9
Other	236	0.3	196	0.2	-0.1	-22.6
Any	3137	3.8	1875	2.1	-1.7	-44.3
Any (excl. breaches)	3118	3.7	1864	2.1	-1.7	-44.3

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

The presentation of age-specific prevalence rates above suggests that, overall, a substantially smaller proportion of the 1994 birth cohort had contact with the police prior to age 21. However, since some offenders may have contact with the criminal justice at more than one age, it is therefore difficult to be sure that the disparity between the two birth cohorts is the result of a fall in population prevalence, and not just a substantial reduction in the frequency of offending for those who are active offenders. In other words, the differences seen in the Figure 1 and Table 1 may be the consequence of there being fewer offenders (lower prevalence) committing roughly the same number of offences, or the same number of offenders committing substantially fewer offences, or both.

To help answer this question, Figure 2 presents the cumulative prevalence of offending for both the 1984 and 1994 birth cohorts. It shows that, by age 21 (depicted as the prevalence at age 20 in Figure 2, as this covers the period up to the day before their 21st birthday), 9.5 percent of the 1984 birth cohort had at least one proven offence. The equivalent estimate for the 1994 birth cohort was 4.8 percent indicating that, proportional to population, almost half (down 49%) as many young people born in 1994 had been in contact with the criminal justice system for at least one proven offence compared with their peers born 10 years earlier.

Figure 2: Cumulative prevalence of offending (cumulative % of cohort by age, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table 2 disaggregates these data by offence type and illustrates that for the 1984 and 1994 birth cohorts, by the age of 21 years:

- The prevalence of violent offending was 2.6 and 1.8 percent, respectively – a decline of 32 percent.
- The prevalence of property offending was 3.8 and 1.7 percent, respectively – a decline of 56 percent.
- The prevalence of drug offending was 1.7 and 1.3 percent, respectively – a decline of 22 percent; the smallest of the offence specific declines.
- The prevalence of disorderly conduct offences was 3.3 and 1.9 percent, respectively – a decline of 42 percent.

Within the category of violence, the largest decline in prevalence was seen for robbery and sex offences (down 43% and 42%, respectively). The fall in prevalence was comparatively lower for assault (down 29%) and other violent offences (26%). Among the property offences, motor vehicle and other property theft offences (not elsewhere classified) exhibited the largest decline in prevalence

(59%, respectively). Burglary, on the other hand, saw the smallest decline; estimated at 46 percent. With the exception of drinkdriving (down 49%), it is worth noting that even this 46 percent decline for burglary was still greater than was seen for any other offence type.

Table 2: Cumulative prevalence of offending to 21 years of age (1984 and 1994)

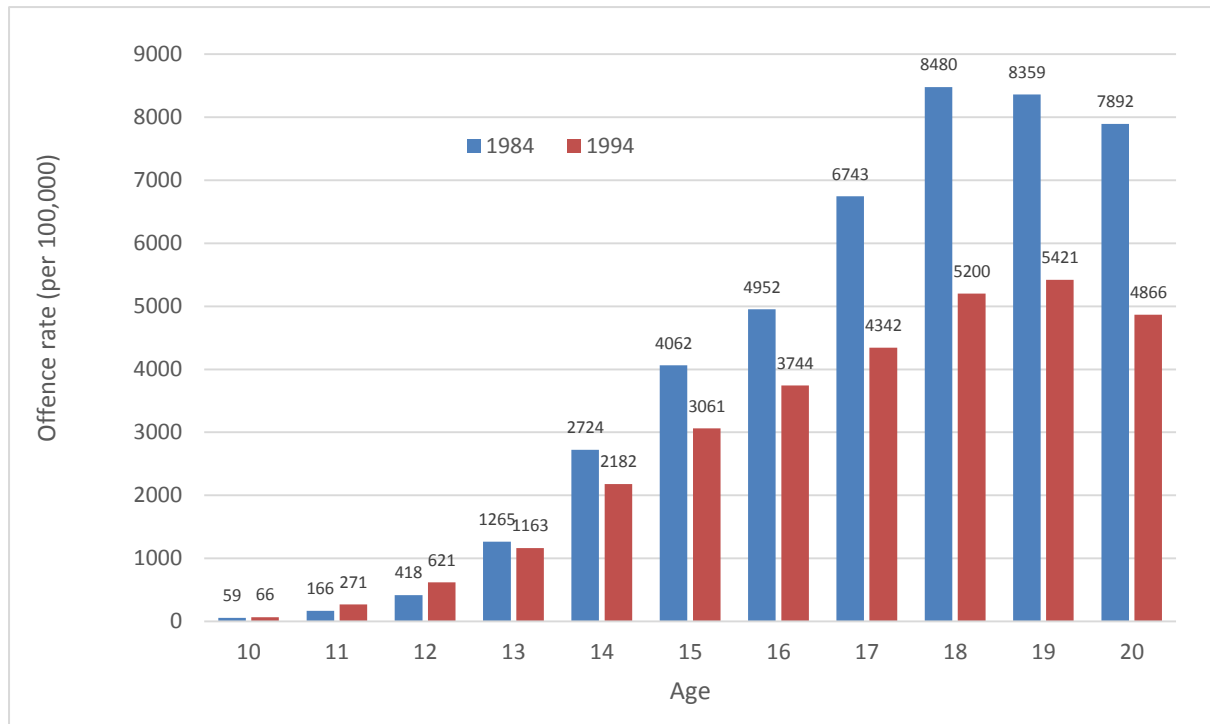
	1984		1994		Summary of change	
	n	%	n	%	% difference in prevalence	% change in prevalence
Violent	2162	2.6	1571	1.8	-0.8	-32.3
Assault	975	1.2	748	0.8	-0.3	-28.5
Sex	67	0.1	42	0.0	0.0	-41.6
Robbery	319	0.4	196	0.2	-0.2	-42.7
Other violent	1459	1.8	1152	1.3	-0.5	-26.4
Property	3207	3.8	1512	1.7	-2.2	-56.0
Burglary	1030	1.2	594	0.7	-0.6	-46.2
Vehicle theft	830	1.0	363	0.4	-0.6	-59.2
Stealing	1934	2.3	1028	1.2	-1.2	-50.4
Other property	1283	1.5	559	0.6	-0.9	-59.4
Drug	1384	1.7	1163	1.3	-0.4	-21.7
Drink driving	2092	2.5	1135	1.3	-1.2	-49.4
Traffic	2496	3.0	1687	1.9	-1.1	-37.0
Disorder	2748	3.3	1707	1.9	-1.4	-42.1
Breach	598	0.7	916	1.0	0.3	42.8
Other	935	1.1	709	0.8	-0.3	-29.3
Any	7900	9.5	4341	4.9	-4.6	-48.8
Any (excl. breaches)	7887	9.5	4332	4.8	-4.6	-48.8

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Frequency

The standardised number (per 100,000) of proven offences recorded at each age is presented for the 1984 and 1994 birth cohorts in Figure 3. For the 1984 cohort, the peak age of offending was 18 years, during which there was 8,480 proven offences per 100,000 of the population. For the 1994 cohort, the peak age of offending was one year later at 19 year years, during which there was 5,421 offences recorded per 100,000 of the population. A comparison of these standardised rates suggests that even at their respective ages of peak offending, the 1994 birth cohort were responsible for 36 percent fewer offences than were their peers born in 1984.

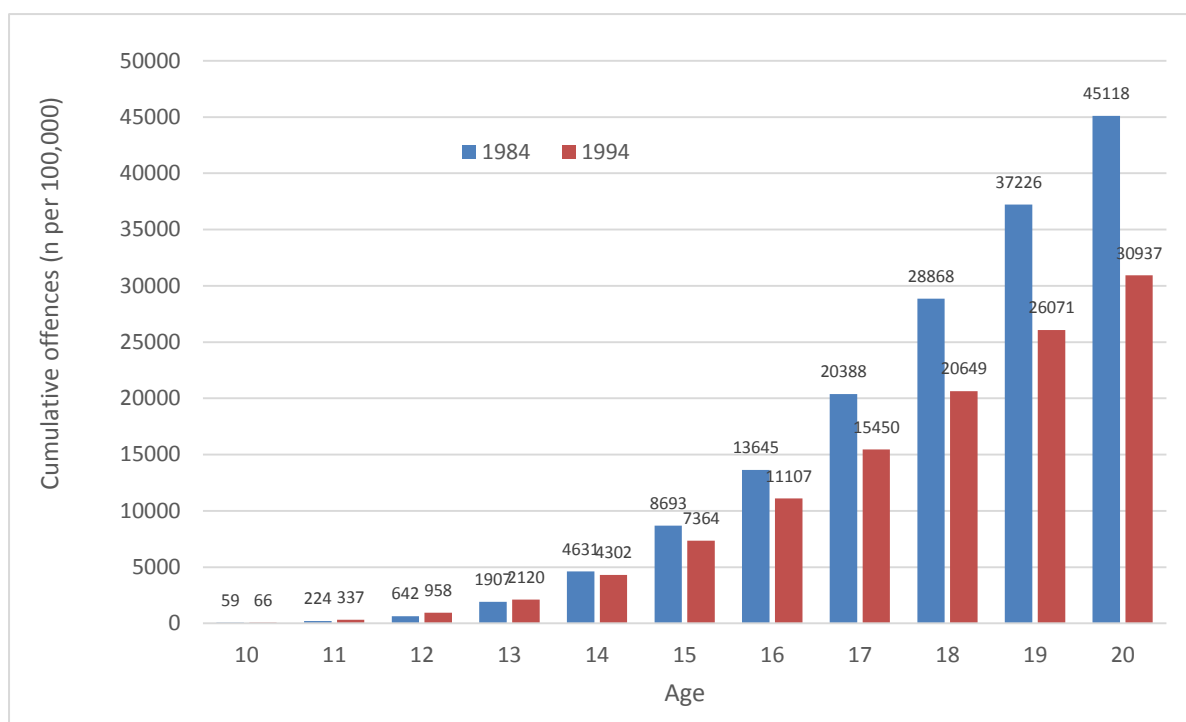
Figure 3: Annual frequency of offending (rate per 100,000 population of cohort by age, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

The cumulative rate of offending by age (Figure 4) shows that the gap between the two cohorts increased as offenders aged. At age 14, the 1984 cohort committed offences at a rate of 4,631 per 100,000 individuals, compared with 4,302 per 100,000 for the 1994 cohort – a difference of seven percent. By the age of 21, the 1984 cohort recorded offences at a rate of 45,118 per 100,000 over their lifetime, compared with 30,937 per 100,000 for the 1994 cohort – a difference of 31%. In other words, by the age of 21, those born in 1994 committed almost one third fewer offences in total than those born in 1984.

Figure 4: Cumulative frequency of offending (cumulative rate of offending per 100,000 individuals in cohort by age, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

The cumulative rate of offending to age 21 was also examined by type of offence (Table 3) and there was some variation between the two cohorts. For example, the largest reductions in cumulative offence rates were observed for stealing motor vehicle (-63%), other property offences (-60%) and drink driving (-52%). In contrast, breach offences increased by 171 percent - the only category of offence to increase between 1984 and 1994.

Table 3: Cumulative offence counts to 21 years of age (1984 and 1994)

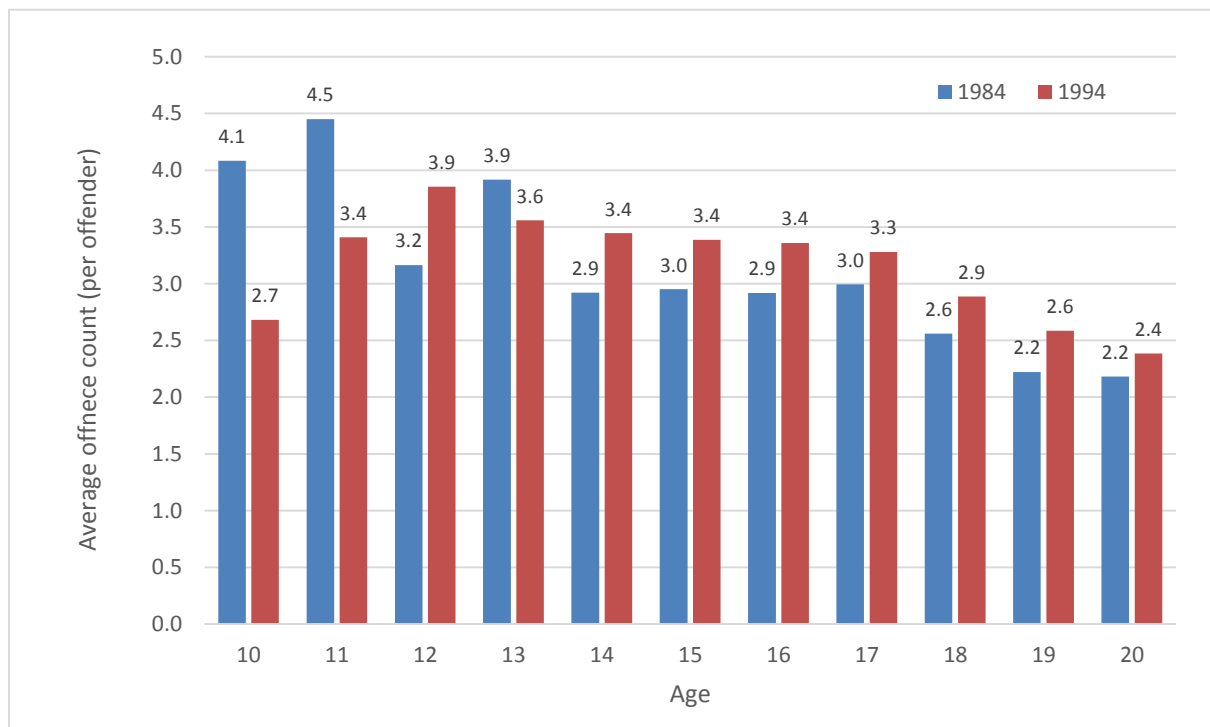
	1984		1994		Summary of change	
	n	rate (per 100,000)	n	rate (per 100,000)	Rate ratio	% change
Violent	5076	6091.6	4211	4711.7	0.8	-22.7
Assault	1549	1858.9	1278	1430.0	0.8	-23.1
Sex	156	187.2	71	79.4	0.4	-57.6
Robbery	585	702.0	350	391.6	0.6	-44.2
Other violent	2786	3343.4	2512	2810.7	0.8	-15.9
Property	11693	14032.5	6017	6732.5	0.5	-52.0
Burglary	2748	3297.8	1577	1764.5	0.5	-46.5
Vehicle theft	1712	2054.5	686	767.6	0.4	-62.6
Stealing	4346	5215.5	2511	2809.6	0.5	-46.1
Other property	2887	3464.6	1243	1390.8	0.4	-59.9
Drug	2239	2687.0	1869	2091.2	0.8	-22.2
Drink driving	2388	2865.8	1227	1372.9	0.5	-52.1
Traffic	5982	7178.9	3984	4457.7	0.6	-37.9

Disorder	6817	8180.9	5246	5869.8	0.7	-28.3
Breach	1326	1591.3	3848	4305.6	2.7	170.6
Other	1411	1693.3	1243	1390.8	0.8	-17.9
Any	37596	45118.1	27649	30936.6	0.7	-31.4
Any (excl. breaches)	36270	43526.8	23801	26631.1	0.6	-38.8

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

It is worth noting here that the proportional decline in offence counts to age 21 (down 31%) is not as large as the proportional decline in prevalence shown earlier (down 48%). For this to occur suggests that while there were fewer offenders in 1994, of those who did come into contact with the criminal justice system the individual rates of offending (average number of offences recorded per offender) were higher than their peers born in 1984. To confirm this, Figure 5 plots the average number of offences recorded by active offenders at each age – calculated by dividing the number of proven offences by the number of individuals for whom there was at least one recorded offence. The results show that for all but three discrete ages (10, 11 and 13, where offending was very low), the average number of proven offences per offender was higher for the 1994 birth cohort.

Figure 5: Concentration of offending (cohort by age, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

The presentation of the concentration of offending by age in Figure 5 provides an important illustration of the age-specific frequencies of offending but mask the possibility (and high likelihood) that a small group of offenders will contribute offences to the offence counts at several different ages. To the extent this is true, then the average number of offences committed per active offender up to age 21 will be higher since a single offender can be counted only once despite which and in how many ages he/she appears in the data.

Confirmation of this is provided in Table 4, where the total (unstandardized) number of proven offences is provided, as well as the average number of offences per active offender for the 1984 and

1994 birth cohorts. The raw unstandardized offence counts aren't themselves directly comparable between the cohorts, since the base populations are different. The average offence count is, however, a comparable estimate of the extent to which the offending frequencies of active offenders changed between the 1984 and 1994 cohorts.

Overall, the results illustrate that although more proven offences were recorded for the 1984 cohort (37,596 vs. 27,649), the average number of offences committed per offender was lower (4.8 offences per offender vs. 6.4 offences per offender). The average proven offence count for offenders born in 1994 was 34 percent higher than estimated for their peers born 10 years earlier.

By offence type, the results indicate that by age 21:

- The average number of violent offences committed was 2.3 and 2.7, respectively – an increase of 14 percent.
- The average number of property offences committed was 3.6 and 4.0 respectively – an increase of nine percent. It is notable that for motor vehicle theft, there was an eight percent decline in the average number of offences per offender.
- The average number of drug offences was 1.6 and 1.6, respectively – equivalent to no change over 10 years.
- The average number of drinkdrunk driving offences was 1.1 and 1.1, respectively – equivalent to no change over 10 years.
- The average number of disorder offences was 2.5 and 3.1, respectively – an increase of 24 percent.

Perhaps the most notable of findings here is for the category of breach offences, where the average number of offences per offender increased by 90 percent from 2.2 to 4.2 offences to age 21.

Table 4: Cumulative offence counts to 21 years of age (1984 and 1994)

	1984		1994		Summary of change	
	n	Average per offender	n	Average per offender	Rate ratio	% change
Violent	5076	2.3	4211	2.7	1.1	14.2
Assault	1549	1.6	1278	1.7	1.1	7.5
Sex	156	2.3	71	1.7	0.7	-27.4
Robbery	585	1.8	350	1.8	1.0	-2.6
Other violent	2786	1.9	2512	2.2	1.1	14.2
Property	11693	3.6	6017	4.0	1.1	9.1
Burglary	2748	2.7	1577	2.7	1.0	0.0
Vehicle theft	1712	2.1	686	1.9	0.9	-8.4
Stealing	4346	2.2	2511	2.4	1.1	8.7
Other property	2887	2.3	1243	2.2	1.0	-1.2
Drug	2239	1.6	1869	1.6	1.0	0.0
Drink driving	2388	1.1	1227	1.1	1.0	0.0

Traffic	5982	2.4	3984	2.4	1.0	-1.5
Disorder	6817	2.5	5246	3.1	1.2	23.9
Breach	1326	2.2	3848	4.2	1.9	89.5
Other	1411	1.5	1243	1.8	1.2	16.2
Any	37596	4.8	27649	6.4	1.3	33.8
Any (excl. breaches)	36270	4.6	23801	5.5	1.2	19.5

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Chronicity

The picture that has so far been painted by these data suggests that considerably fewer individuals of the 1994 birth cohort were formally processed in the criminal justice system, but of those who were, the number of crimes committed was marginally higher. The overall decline in offending, it seems, has been driven almost exclusively by a shift in prevalence rather than frequency or chronicity, per se.

To consider this issue in more detail we classify active offenders into one of three possible categories¹:

- once-only offenders – those who committed only one crime by age 21;
- moderate offenders – those who recorded between two and four crimes by age 21; and
- chronic offenders – those who recorded five or more crimes by age 21.

Table 5, reminds us that the population prevalence of offending for the 1984 and 1994 birth cohorts was 9.5 and 4.8 percent, respectively. Further, the data show that:

- In 1984, once-only offenders comprised 41 percent of the offending population – equal to 3.9 percent of the total birth cohort. The equivalent group from 1994 represented 35 percent of the offending population and only 1.7 percent of the total population.
- Moderate offenders (those committing between 2 and 4 offences) accounted for 36 percent of the 1984 offender population and 33 percent of the 1994 offender population (3.4 and 1.6 percent of their respective birth cohorts).
- Chronic offenders represented one in four (23%) of the 1984 offender cohort, but one in three (32%) of the 1994 offender cohort (equal to 2.2 and 1.5 percent of their total populations, respectively).

Of these data, we make a number of important observations. First, a large proportion of once-only offenders appear to have dropped out of the offender population in 1994. In fact, proportional to population, the prevalence of once-only offending had more than halved. Second, there also appears to have been a substantial fall in the population prevalence of moderate offending – again, there being less than half the number of moderate offenders in the 1994 birth cohort than there was in the 1984 cohort. Finally, although still in decline somewhat, chronic offenders nevertheless comprise a larger proportion of the offender population born in 1994.

Table 5: Once-off, Low rate and Chronic Offenders by age 21 (proportion of population and proportion of offenders) (1984 and 1994)

¹ We recognise that there is no specific threshold for what constitutes chronic offending, however we use the 5+ cut-off as a heuristic tool consistent with the classification of chronicity as seen in other criminal career studies.

	1984			1994		
	n	% of population	% of offenders	n	% of population	% of offenders
1 offence	3216	3.9	40.8	1529	1.7	35.3
2-4 offences	2853	3.4	36.2	1438	1.6	33.2
5+ offences	1818	2.2	23.1	1365	1.5	31.5
Total	7887	9.5	100.0	4332	4.8	100.0

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

That of the 1994 birth cohort chronic offenders comprise a larger proportion of the offender population suggests that chronics are also responsible for a larger share of all the offences committed. To confirm this, Table 6 provides the number of crimes committed by each of the three offender groups, their average rate of offending, and the percentage of all offences for which they were responsible. The results indicate that:

- For offenders born in 1984, there were 3,216 once-off offenders responsible for nine percent of all crimes recorded by the cohort. For offenders born in 1994, there were 1,529 once-off offenders responsible for only six percent of the offences recorded.
- The average rate of offending for moderate offenders declined from 3.0 to 2.7, respectively. As a consequence, moderate offenders from the 1984 cohort were responsible for a higher proportion of crimes (23% vs. 16% for moderate offenders in the 1994 cohort).
- While the average number of offences committed by chronic offenders was the same in both cohorts, the relative over-representation of chronic offenders in the 1994 cohort means that these offenders are responsible for a higher proportion of the total crime count (77% vs. 68% for the 1984 cohort).

As has been demonstrated consistently in other studies, a small proportion of chronic offenders are often responsible for the majority of crime. In these data, the conclusion is the same except that the diminishing number of once-only and moderate offenders in 1994 has meant that chronic offenders, though not offending at higher rates, are now responsible for a disproportionately greater number of offences recorded than was the case for their peers born in 1984.

Table 6: Once-off, Moderate and Chronic Offenders by age 21 (average offence rate and proportion of offences) (1984 and 1994)

	1984				1994			
	Offenders (n)	Offences (n)	Average	% of offences	Offenders (n)	Offences (n)	Average	% of offences
1 offence	3216	3216	1.0	8.9	1529	1529	1.0	6.4
2-4 offences	2853	8480	3.0	23.4	1438	3892	2.7	16.4
5+ offences	1818	24574	13.5	67.8	1365	18380	13.5	77.2
Total	7887	36270	4.6	100	4332	23801	5.5	100

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table 7 disaggregates these data by offence type and presents three separate summary statistics for the 1984 and 1994 cohorts. The first is the average offence rate, calculated as the number of offences attributable to chronic offenders divided by the number of offenders. The second identifies the proportion of chronic offenders for whom there was at least one of the relevant offences. The third

estimates the proportion of all offences (committed by each entire cohort) which were attributable to chronic offenders. Of these data, a number of observations can be made:

- Chronic offenders were responsible for a larger proportion of all crimes committed in 1994 compared with their peers in 1984.
- In the later cohort (1994) a greater proportion of chronic offenders were proven for violent offending (71% vs. 62%) and they were responsible for more violent offences on average (2.5 vs. 1.9 offences). Overall, chronic offenders were responsible for a larger share of all violent offences recorded by the 1994 cohort (81% vs. 70%).
- The proportion of chronic offenders identified as responsible for at least one property offence decreased in the 1994 cohort (74% vs. 81%), as did the average offence rate (3.9 vs. 5.0), however, despite these falls, chronic offenders were still responsible for a higher proportion of the total number of property offences recorded by each cohort (89% vs. 77%).
- The involvement of chronic offenders in drug offending was relatively unchanged between the cohorts. There was only a modest increase in the proportion responsible for at least one proven drug offence (41% vs. 35%) and the average offence rate (0.8 vs. 0.7).
- Road and traffic offending, together with drinkdriving driving offending, remained relatively unchanged for the chronic offenders in both cohorts.

Table 7: Average offence rate and proportion of offences committed by chronic offenders (5+) (1984 and 1994)

	1984				1994			
	Offence count (n)	Average offence count per chronic offender	% of chronics with at least one count	% of all offences attributable to chronics	Offence count (n)	Average offence count per chronic offender	% of chronics with at least one count	% of all offences attributable to chronics
Violent	3545	1.9	61.6	69.8	3415	2.5	71.2	81.1
Assault	1123	0.6	32.9	72.5	1030	0.8	38.8	80.6
Sex	57	0.0	1.6	36.5	44	0.0	1.6	62.0
Robbery	434	0.2	11.9	74.2	317	0.2	12.2	90.6
Other violent	1931	1.1	46.6	69.3	2024	1.5	56.1	80.6
Property	9022	5.0	80.7	77.2	5334	3.9	74.4	88.6
Burglary	2361	1.3	38.9	85.9	1444	1.1	35.2	91.6
Vehicle theft	1446	0.8	32.2	84.5	625	0.5	22.3	91.1
Stealing	3246	1.8	57.8	74.7	2170	1.6	55.2	86.4
Other property	1969	1.1	40.0	68.2	1095	0.8	32.2	88.1
Drug	1224	0.7	35.4	54.7	1080	0.8	41.0	57.8
Drink driving	570	0.3	23.2	23.9	309	0.2	19.3	25.2
Traffic	3823	2.1	54.7	63.9	2672	2.0	54.0	67.1
Disorder	5005	2.8	74.1	73.4	4500	3.3	80.3	85.8
Breach	1151	0.6	25.9	86.8	3549	2.6	52.0	92.2
Other	1032	0.6	33.8	73.1	1066	0.8	39.9	85.8
Any	25725	14.2	100.0	68.4	21929	16.1	100.0	79.3
Any (excl. breaches)	24574	13.5	100.0	67.8	18380	13.5	100.0	77.2

Age of onset

Despite a substantial decline in the prevalence of offending for the 1994 birth cohort, the age of onset for those who were processed by the police remained almost unchanged (see Table 8). For the 1994 cohort, for example, the average age of first offence was 17.1 years (median - 18 years) and only a fraction younger than was estimated for the 1984 cohort (17.3 years, median - 18 years).

Between the three types of offenders identified in the previous section, several interesting findings emerged:

- The earliest age of offending for once-off offenders born in 1984 was 10 years of age. For those born in 1994, however, the earliest age of first offence was not until 12 years of age. Despite this, the average age of onset for all once-only offenders was only marginally later for the 1994 cohort (18.8 years vs. 18.4 years).
- Almost identical results emerged for moderate offenders born in 1984 and 1994. For example, moderate offenders from both cohorts had an average age of onset at 17.3 years (median - 18 years).
- For chronic offenders, although the median age of onset was equal (15 years, respectively) the average age of onset was marginally earlier for those born in 1994 (15.0 years) compared with those born in 1984 (15.6). This suggests that, proportional to group-size, a larger number of chronic offenders in the more recent cohort had first been processed for a proven offence at relatively younger ages.

Table 8: Age of onset by number of offences (1984 and 1994)

	1984				1994			
	Min	Max	Mean	Median	Min	Max	Mean	Median
One	10	20	18.4	19	12	20	18.8	19
Two-to-Four	11	20	17.3	18	10	20	17.3	18
Five or more	10	20	15.6	15	10	20	15.0	15
All offenders	10	20	17.3	18	10	20	17.1	18

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table 9 examines the offence at first contact for each of the known offenders in the 1984 (n=7887) and 1994 (n=4332) cohorts. For the 1984 cohort, for example:

- Property offending was the offence of first contact for one in three offenders (32%). It was the most frequently identified offence at the age of onset. Among the property offences, stealing was the most frequently identified onset offence (17%), followed by other property offences (9%), burglary (8%) and motor vehicle theft (6%).
- Disorderly offences were the second most often identified as onset offences (22%), followed by road traffic offences (20%) and drink/drive driving offences (19%).
- Violent offending was the first contact offence for 16 percent of offenders, other violence being the most likely onset offence (10%), followed by assault (5%) and robbery (2%).

For offenders born in 1994:

- Property offences remain the most prevalent at onset (25%), however they now share this position with disorderly conduct offences (25%). The equalisation of these two offence types is explained, in part, by the proportional increase in disorderly conduct as an onset offence (up 14%) but also by the proportional decline in property offending (down 22%).
- Of the specific sub categories of property crime, the largest downward shift between the 1984 and 1994 cohorts occurred for motor vehicle theft (down 44%), followed by other property offences (down 41%) and stealing (down 14%). Burglary – an onset offence for 7.5 percent of offenders – remained relatively unchanged (down 1%).
- Commensurate with the decline in property crime, the prevalence of violence as an onset offence increased (up 28% to 21% of the 1994 cohort) – driven in large part by proportional increases in assault and other violence as onset offences (up 24% and 36%, respectively). The only violent offence not increasing between the two cohorts was robbery, which fell by 11 percent proportionally.
- Offences related to illicit drugs were more commonly identified as onset offences among those born in 1994 (up 38%), while drink driving offences were less common (down 7%).

Table 9: Offence type at age of onset (1984 and 1994)

	1984 (n=7887)		1994 (n=4332)		Summary	
	n	%	n	%	% difference	% change
Violent	1293	16.4	909	21.0	4.6	28.0
Assault	429	5.4	293	6.8	1.3	24.3
Sex	42	0.5	25	0.6	0.0	8.4
Robbery	149	1.9	73	1.7	-0.2	-10.8
Other violent	790	10.0	591	13.6	3.6	36.2
Property	2552	32.4	1098	25.3	-7.0	-21.7
Burglary	591	7.5	321	7.4	-0.1	-1.1
Vehicle theft	479	6.1	147	3.4	-2.7	-44.1
Stealing	1318	16.7	625	14.4	-2.3	-13.7
Other property	677	8.6	221	5.1	-3.5	-40.6
Drug	777	9.9	589	13.6	3.7	38.0
Drink driving	1478	18.7	759	17.5	-1.2	-6.5
Traffic	1543	19.6	946	21.8	2.3	11.6
Disorder	1758	22.3	1096	25.3	3.0	13.5
Breach	133	1.7	288	6.6	5.0	294.2
Other	379	4.8	219	5.1	0.3	5.2

Note: double counting permitted if an offender was processed for two different offences at the same age

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

The shifting profile of onset offending was starkest among offenders who by age 21 had committed only one offence (see Table 10). Specifically, proportional to group size there was a considerable decline in the prevalence of property offending (down 71%), including stealing (down 77%) motor vehicle theft (down 72%), burglary (down 61%) and other property offending (down 64%). Declines were also seen for disorderly conduct offences (down 33%) and robbery (down 64%), although robbery was rare as an onset offence in both cohorts.

Weighing against these declines were increases (proportional to group size) in drug offences (up 85%), road traffic offences (up 45%) and drink driving offences (up 20%). Violence overall remained unchanged, however there was a proportional increase in assault (up 4%), other violent offences (up 9%) and sex offences (up 11%). Although relatively uncommon, the prevalence of breach offending at onset rose by 321 percent among offenders in the 1994 cohort.

Table 10: Offence type at age of onset (Once-off offenders, 1984 and 1994)

	1984 (n=3216)		1994 (n=1529)		Summary	
	n	%	n	%	% difference	% change
Violent	341	10.6	164	10.7	0.1	1.2
Assault	107	3.3	53	3.5	0.1	4.2
Sex	19	0.6	10	0.7	0.1	10.7
Robbery	29	0.9	5	0.3	-0.6	-63.7
Other violent	186	5.8	96	6.3	0.5	8.6
Property	600	18.7	84	5.5	-13.2	-70.6
Burglary	87	2.7	16	1.0	-1.7	-61.3
Vehicle theft	53	1.6	7	0.5	-1.2	-72.2
Stealing	295	9.2	33	2.2	-7.0	-76.5
Other property	165	5.1	28	1.8	-3.3	-64.3
Drug	236	7.3	208	13.6	6.3	85.4
Drink driving	924	28.7	526	34.4	5.7	19.7
Traffic	553	17.2	382	25.0	7.8	45.3
Disorder	440	13.7	141	9.2	-4.5	-32.6
Breach	13	0.4	26	1.7	1.3	320.7
Other	54	1.7	22	1.4	-0.2	-14.3

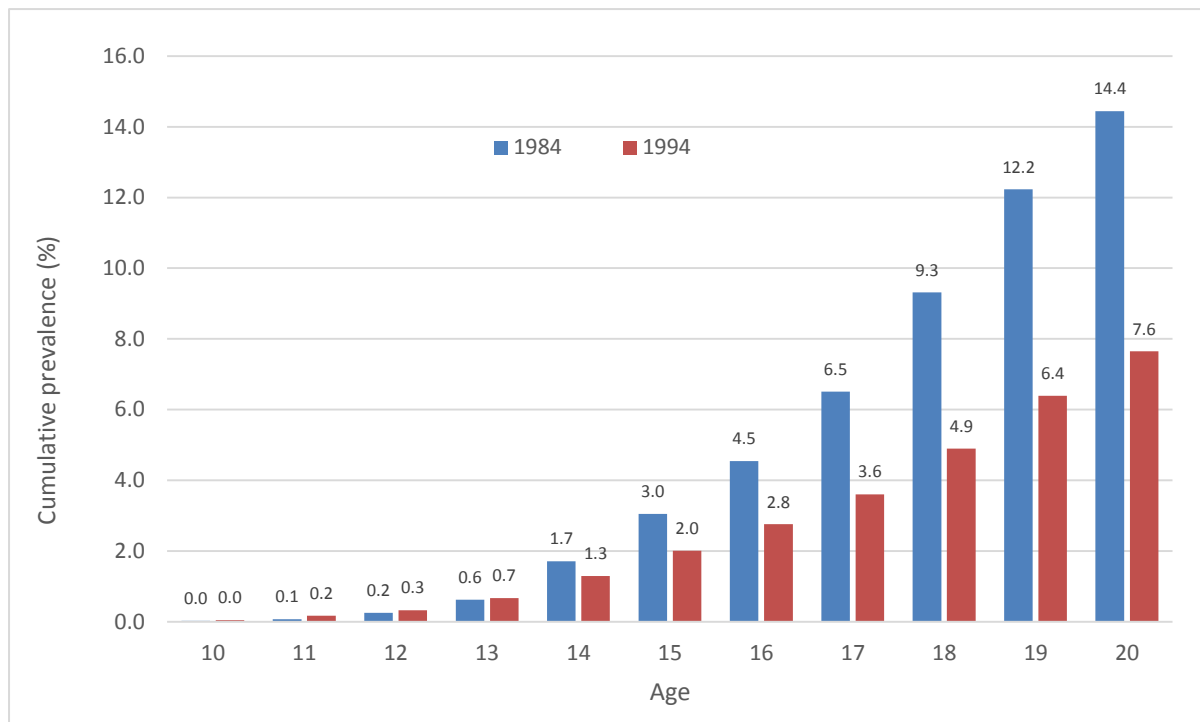
Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Gender

Detailed tables, disaggregated by gender, are provided in Appendix A. Here, Figures 6 and 7 provide a summary of these data as gender-specific cumulative prevalence estimates for each birth cohort. For males born in 1984, the population prevalence of offending to age 21 was 14.4 percent. For males born in 1994, the prevalence was 7.6 percent – a 47 percent decline. For females, the population prevalence by age 21 was 3.6 percent for the 1984 cohort and 1.8 percent for the 1994 cohort. Although modest, these data suggest that the decline in prevalence was greater for young women (down 49%).

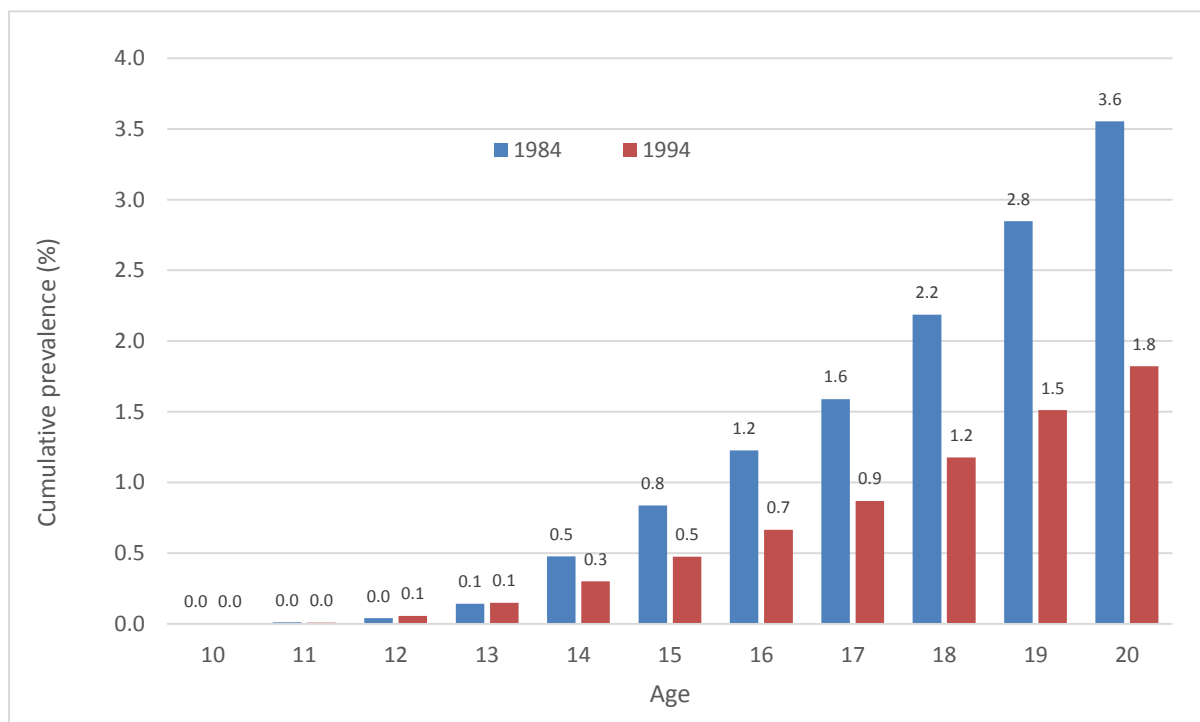
Consistent with the criminal career literature, four times as many young males had contact with the criminal justice system by age 21. However, this over-representation of young males increased from 4.0 in the 1984 cohort to 4.2 in the 1994 cohort.

Figure 6: Cumulative prevalence of offending by age (Males, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Figure 7: Cumulative prevalence of offending by age (Females, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Tables 11 and 12 provide offence-specific data for males and females by cohort. The key parameter of interest here is the comparative proportional decline by gender (the final column in both tables)

which indicates offence types for which there was a disproportionate change between the 1984 and 1994 birth cohorts. For example:

- The decline in violence was greater for young males (down 31% vs. 28%), however this trend was not equal across all violent offence types. The prevalence of assault, for instance, decreased considerably more for young males (down 30% vs. 10%), while the prevalence of robbery decreased more for young women (down 62% vs. 36%).
- The fall in property offending was universally greater for young women (down 61% vs. 53%) – a finding that was consistent for burglary (down 64% vs. 42%), motor vehicle theft (down 61% vs. 58%), stealing (down 56% vs. 47%) and other property offences (down 67% vs. 56%).
- The decline in drug offending was also greater for young women (down 30% vs. 18%), while the decline in road traffic offences was greater for young men (down 38% vs. 13%).

Table 11: Cumulative prevalence of offending to 21 years of age (Males, 1984 and 1994)

	1984		1994		Summary	
	n	%	n	%	% difference in prevalence	% change in prevalence
Violent	1785	4.0	1267	2.8	-1.2	-30.9
Assault	804	1.8	577	1.3	-0.5	-30.2
Sex	67	0.2	40	0.1	-0.1	-41.9
Robbery	262	0.6	172	0.4	-0.2	-36.1
Other violent	1194	2.7	934	2.0	-0.6	-23.9
Property	2537	5.7	1223	2.7	-3.0	-53.1
Burglary	909	2.0	546	1.2	-0.8	-41.5
Vehicle theft	725	1.6	317	0.7	-0.9	-57.5
Stealing	1501	3.4	815	1.8	-1.6	-47.2
Other property	998	2.2	454	1.0	-1.2	-55.7
Drug	1218	2.7	1033	2.3	-0.5	-17.5
Drink driving	1750	3.9	933	2.0	-1.9	-48.1
Traffic	2206	4.9	1407	3.1	-1.9	-37.9
Disorder	2372	5.3	1467	3.2	-2.1	-39.8
Breach	516	1.2	778	1.7	0.5	46.7
Other	784	1.8	588	1.3	-0.5	-27.0
Any	6450	14.5	3511	7.7	-6.8	-47.0
Any (excl. breaches)	6441	14.4	3506	7.6	-6.8	-47.0

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table 12: Cumulative prevalence of offending to 21 years of age (Females, 1984 and 1994)

	1984		1994		Summary	
	n	%	n	%	% difference in prevalence	% change in prevalence
Violent	377	0.9	304	0.7	-0.3	-27.6
Assault	171	0.4	171	0.4	0.0	-10.2
Sex	0	0.0	2	0.0	0.0	n/a

Robbery	57	0.1	24	0.1	-0.1	-62.2
Other violent	265	0.7	218	0.5	-0.2	-26.1
Property	670	1.6	289	0.6	-1.0	-61.3
Burglary	121	0.3	48	0.1	-0.2	-64.4
Vehicle theft	105	0.3	46	0.1	-0.2	-60.6
Stealing	433	1.1	213	0.5	-0.6	-55.8
Other property	285	0.7	105	0.2	-0.5	-66.9
Drug	166	0.4	130	0.3	-0.1	-29.7
Drink driving	342	0.8	202	0.4	-0.4	-46.9
Traffic	290	0.7	280	0.6	-0.1	-13.3
Disorder	376	0.9	240	0.5	-0.4	-42.7
Breach	82	0.2	138	0.3	0.1	51.2
Other	151	0.4	121	0.3	-0.1	-28.0
Any	1450	3.6	830	1.8	-1.7	-48.6
Any (excl. breaches)	1446	3.6	826	1.8	-1.7	-48.7

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

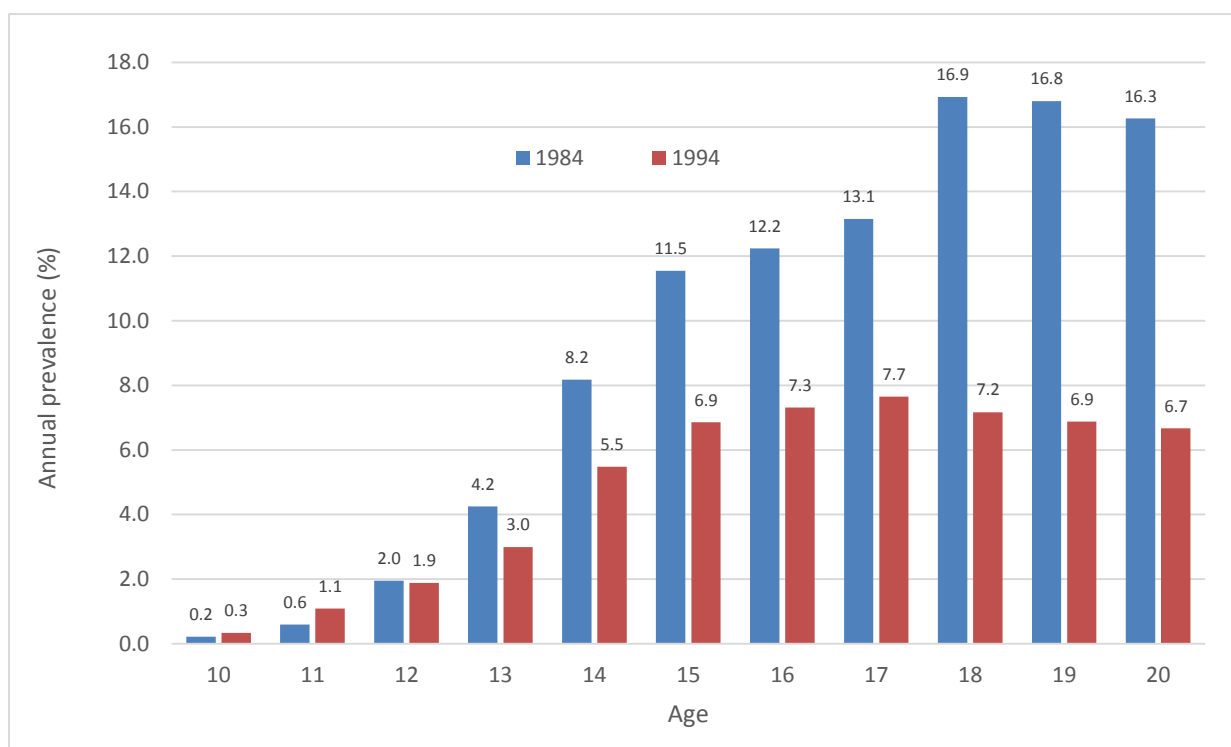
Indigenous offenders

The analysis for Indigenous members of the 1984 and 1994 birth cohorts is complicated in this study by the absence of Indigenous population estimates specific to the 1984 and 1994 NSW birth cohorts. Unfortunately, at the time of extraction, Indigenous identifiers could not be reliably extracted from the NSW Registry of Births Deaths and Marriages meaning that the population denominator for standardisation needed to be elsewhere identified. To overcome this limitation, the analysis presented herein uses NSW Indigenous population projections from the Australian Bureau of Statistics. Specifically, we estimate that there were 3,179 and 4,784 Indigenous births in 1984 and 1994, respectively.

Figure 8 provides the age-specific prevalence of offending for Indigenous offenders from both cohorts. Consistent with our earlier findings, the prevalence of offending was considerably lower for the Indigenous population born in 1994. The peak age of offending for the 1994 birth cohort was 17 years where 7.7 of the Indigenous birth cohort had at least one proven offence. Ten years earlier, the peak age of offending was 18 years of age where 16.9 percent of the Indigenous birth cohort had recorded at least one proven offence. Overall, this difference equates to a 54 percent decline in the population prevalence of offending at the peak offending age.

Beyond these broad descriptive differences, there are a number of other notable changes. For the 1984 cohort in particular, there is a considerable spike in criminal justice contact from age 17 (13.1%) to age 18 (16.9%) after which the prevalence remains relatively unchanged. By contrast, no such spike is seen for the 1994 birth cohort. In fact, rather than increasing, the prevalence of offending declines from 17 to 18 years of age and it is in the early adulthood years where the largest differences emerge between Indigenous offenders born in 1984 and 1994.

Figure 8: Prevalence of offending by age (Indigenous, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

The largest difference between the 1984 and 1994 cohorts was seen at age 19 where the prevalence of offending was 59 percent lower. Using this year as a baseline, Table 13 provides disaggregated data by offence type. With the exception of breach offending, between-cohort declines were seen for all offence types. Above average declines were identified for drink driving (-75%) and all property offence types, including burglary (-64%), vehicle theft (-62%), stealing (-62%) and other property offending (-70%). Although the prevalence of robbery (-34%) and drug offences (-43%) was lower for the 1994 cohort, the declines were not as large as seen for most other offence types.

Table 13: Prevalence of offending at age 19, by offence type (Indigenous, 1984 and 1994)

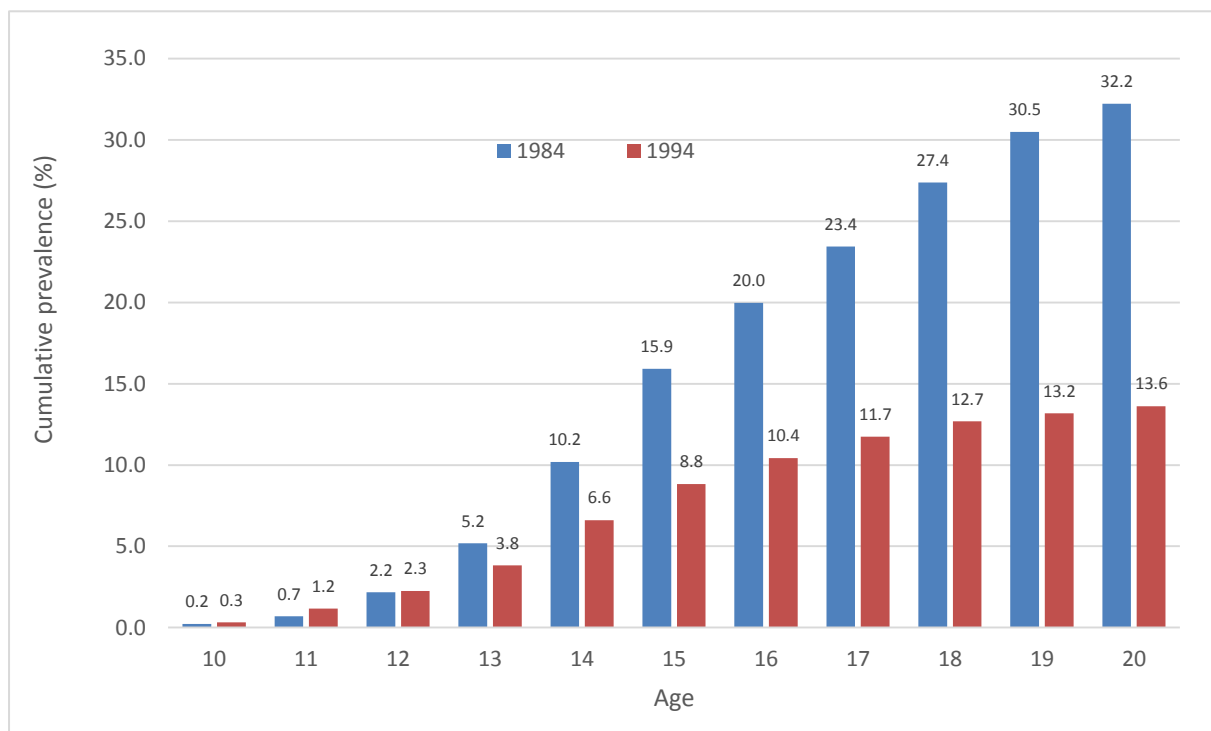
	1984		1994		Summary	
	n	%	n	%	% difference in prevalence	% change in prevalence
Violent	171	5.4	128	2.7	-2.7	-50.3
Assault	84	2.6	64	1.3	-1.3	-49.4
Sex	3	0.1	0	0.0	-0.1	-100.0
Robbery	11	0.3	11	0.2	-0.1	-33.5
Other violent	113	3.6	84	1.8	-1.8	-50.6
Property	202	6.4	101	2.1	-4.2	-66.8
Burglary	55	1.7	30	0.6	-1.1	-63.8
Vehicle theft	40	1.3	23	0.5	-0.8	-61.8
Stealing	97	3.1	56	1.2	-1.9	-61.6
Other property	75	2.4	34	0.7	-1.6	-69.9
Drug	64	2.0	55	1.1	-0.9	-42.9
Drink driving	64	2.0	24	0.5	-1.5	-75.1

Traffic	128	4.0	101	2.1	-1.9	-47.6
Disorder	221	7.0	132	2.8	-4.2	-60.3
Breach	68	2.1	103	2.2	0.0	0.7
Other	62	2.0	67	1.4	-0.5	-28.2
Any	534	16.8	329	6.9	-9.9	-59.1
Any (excl. breaches)	527	16.6	327	6.8	-9.7	-58.8

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Figure 9 presents the cumulative prevalence of offending to age 21 and confirms that the 1984 Indigenous birth cohort were considerably more likely to have contact with the criminal justice system. Specifically, it is estimated that one in three Indigenous persons born in NSW in 1984 had at least one proven offence by age 21 (32.2%). This compares to just over one in eight (13.6%) Indigenous persons born in 1994 – a 58% fall in prevalence.

Figure 9: Cumulative prevalence of offending by age (Indigenous, 1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

The analysis to this point has focused specifically on Indigenous offenders, however the differences seen so far suggests that the decline in offending may have been greater for Indigenous compared with non-Indigenous offenders. To examine this, offence specific prevalence data are presented for both the Indigenous and non-Indigenous cohorts in 1984 and 1994. For comparative purposes, an over-representation estimate is derived as the relative prevalence ratio (Indigenous vs. non-Indigenous) at age 21.

Overall, Indigenous members of the 1984 cohort were over-represented by a factor of 3.8, although over-representation was highest for breach offences ($r=17.4$), assault ($r=13.0$), burglary ($r=12.6$), and robbery ($r=12.5$). Though still over-represented by a factor of 2.4, drink driving was the offence type for which Indigenous and non-Indigenous offenders from the 1984 cohort had the most comparable prevalence.

For the 1994 birth cohort, Indigenous offenders were still over-represented (by a factor of 3.1) although the over-representation rate had declined by approximately 17 percent. Again, members of the 1994 Indigenous birth cohort were over-represented in all offence categories and sub categories, however the over-representation rate declined in some cases, but increased in others. Specifically:

- For property offending overall, the over-representation of Indigenous offenders increased between the 1984 and 1994 cohorts (up by 15.7%). Given that earlier analysis showed that the actual prevalence of property offending declined for Indigenous offenders, this suggests that the decline in property offending was considerably larger for non-Indigenous offenders.
- The over-representation of Indigenous offenders in violence declined between 1984 and 1994 – down by approximately 20 percent. Robbery was the only violent offence type for which the relative over-representation of Indigenous offenders increased (up 14.8%).
- Over-representation for drug offences declined (-41.2%) as did the relative over-representation of Indigenous offenders for drink driving (-37.0%), traffic (-18.7%), disorder (-12.2%) and breach offending (-42.4%).

The story here is one of mixed results. On the one hand members of the Indigenous population remain considerably over-represented in their contact with the criminal justice system. On the other, but in particular for violent and substance related offending, it seems that these differences have improved but nowhere near equalised. For property offending, the over-representation of Indigenous offenders has, in fact, increased despite considerable declines in prevalence overall.

Table 14: Cumulative prevalence of offending at age 21, by offence type (1984 and 1994)

	1984			1994			Summary
	ATSI	Non ATSI	Over-representation (prevalence ratio)	ATSI	Non ATSI	Over-representation (prevalence ratio)	% Change in over-representation
Violent	18.9	1.9	9.7	10.0	1.3	7.7	-20.4
Assault	10.4	0.8	13.0	6.0	0.5	10.9	-16.4
Sex	0.7	0.1	11.5	0.2	0.0	4.8	-58.1
Robbery	3.3	0.3	12.5	1.8	0.1	14.4	14.8
Other violent	14.4	1.2	11.5	7.7	0.9	8.3	-27.8
Property	21.8	3.1	6.9	9.9	1.2	8.0	15.7
Burglary	10.8	0.9	12.6	5.4	0.4	13.7	8.6
Vehicle theft	8.4	0.7	12.0	3.5	0.2	14.9	23.9
Stealing	15.4	1.8	8.5	7.7	0.8	9.9	15.6
Other property	9.6	1.2	7.9	4.5	0.4	10.9	37.8
Drug	8.3	1.4	5.9	4.0	1.1	3.5	-41.2
Drink driving	5.7	2.4	2.4	1.9	1.2	1.5	-37.0
Traffic	12.2	2.6	4.6	6.2	1.6	3.8	-18.7
Disorder	21.0	2.6	8.1	10.2	1.4	7.1	-12.2
Breach	7.7	0.4	17.4	6.9	0.7	10.0	-42.4
Other	9.7	0.8	12.4	5.4	0.5	10.2	-17.8
Any	32.2	8.6	3.8	13.7	4.4	3.1	-16.5

Any (excl. breaches)	32.2	8.6	3.8	13.6	4.3	3.1	-16.6
-----------------------------	------	-----	-----	------	-----	-----	-------

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Trajectories of offending

To this point the analysis has so far focused on the aggregate between-cohort differences, comparing age-specific or cohort-specific prevalence and incidence rates by offence type, gender and Indigenous status. These aggregate summaries provide useful diagnostics for understanding how, as cohorts, young people born 10 years apart in NSW have changed with respect to their offending and contact with the criminal justice system. What is lost in the presentation of cohort aggregates, however, is the extent to which underlying criminal trajectories have also changed, both in terms of size, shape, and overall contribution to the cohort-specific prevalence and incidence rates.

Of course, no two individuals follow an equivalent trajectory and thus the data extracted for this study is comprised of a complex and diverse range of offending pathways for which some degree of generalisation is required. To achieve this, we use a statistical technique known as Semi-Parametric Group Based Modelling (SPGM) with the view to extracting from these complex individual-level data a four-group solution (ie four underlying trajectories) for both the 1984 and 1994 cohorts. Of key consideration in this analysis is the extent to which the four estimated trajectories are qualitatively different with respect to the proportion of offenders following each trajectory (group size) and the average timing of onset, escalation and peak offending (functional form/ trajectory shape). The SPGM technique has been operationalised using the traj module designed for implementation in Stata (Jones and Nagin 2013).

1984 Trajectories

Table 15 presents the final four-group trajectory model which statistically summarises the trajectories of offenders born in 1984. A graphical depiction of these results is provided in Figure 10. For notational convenience, each of the four trajectory groups has been assigned a name, one which best describes the qualitative and quantitative nature of each trajectory. These were:

- Low rate offenders - offenders who had committed just one or two offences between the ages of 10 and 21 – typically in their late teens and early adulthood.
- Adolescent-Limited offenders – offenders who were responsible for between 2 and four proven offences, but where the peak of this offending was in mid-adolescence (15-16 years of age).
- Late-onset offenders – offenders who onset offending at later than average ages, but where the peak rate of offending was recorded between the ages of 18 and 19 years.
- High-rate offenders – those whose first contact with the criminal justice system was at comparatively young ages (between 10 and 12 years) and whose rate of offending peaked at considerably higher rates (6-7 offences per annum) than any of the other three groups.

Qualitatively, these trajectories appear remarkably consistent with those estimated both in Australia and overseas.

A key piece of the SPGM analytical process is the estimation of trajectory-group assignment probabilities. These probabilities provide insight into the relative size of each offender group as a proportion of the offending population. In Table 15, for example, low-rate offenders represented 79

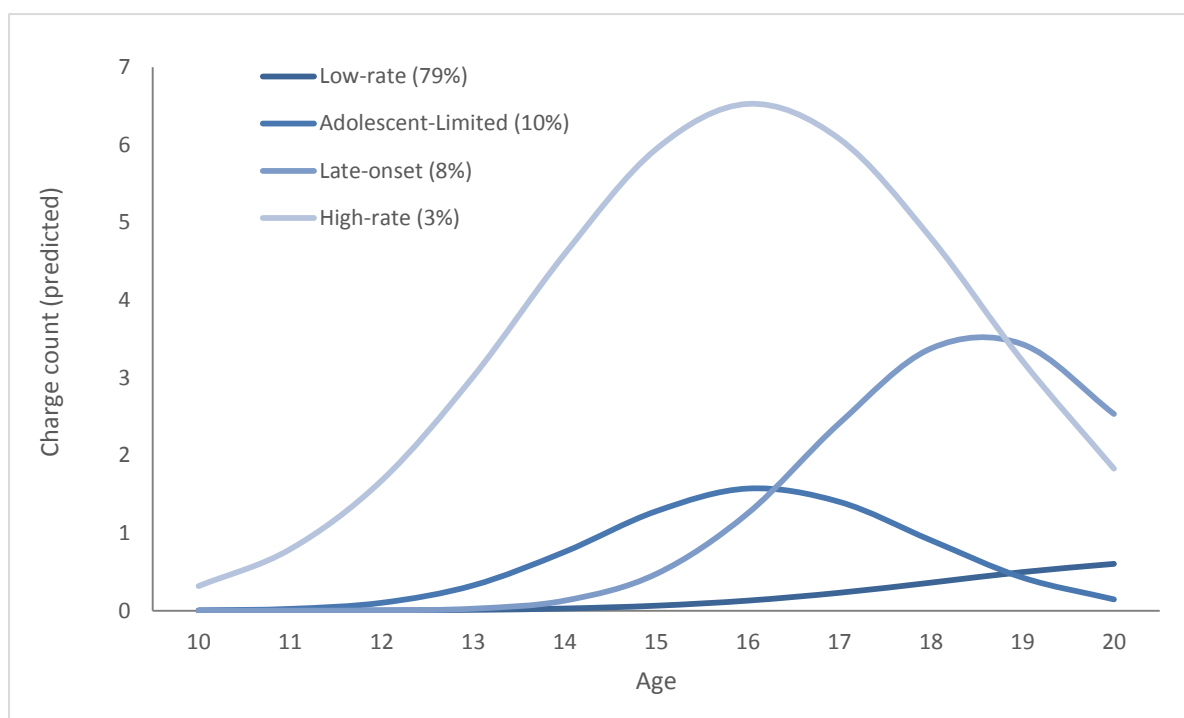
percent of all those from the 1984 cohort who had contact with the criminal justice system. Adolescent limited offenders represented 10 percent of the offender cohort, while late-onset offenders represented eight percent (8.3%) and high-rate offenders represented just three percent (2.7%). Considering that just under 10 percent of the total 1984 birth cohort had contact with the criminal justice system by age 21, these SPGM estimates therefore suggest low-rate offenders represented around eight percent (7.5%) of the total birth cohort, while adolescent limited (0.95%), late-onset (0.78%) and high rate (0.25%) offenders each represented less than one percent of the birth cohort, respectively.

Table 15: Four-trajectory solution (ZIP: 2,2,2,2) for offenders born in 1984

		Estimate	S.E.	T	P
Model parameters					
Low-rate	Intercept	-9.64	0.44	-21.84	0.00
	Linear	1.53	0.10	15.05	0.00
	Quadratic	-0.06	0.01	-10.99	0.00
Adolescent-limited	Intercept	-7.70	0.37	-20.77	0.00
	Linear	2.28	0.11	21.35	0.00
	Quadratic	-0.16	0.01	-20.86	0.00
Late-onset	Intercept	-13.30	0.88	-15.08	0.00
	Linear	3.05	0.20	15.42	0.00
	Quadratic	-0.16	0.01	-14.53	0.00
High-rate	Intercept	-2.23	0.15	-14.75	0.00
	Linear	1.16	0.05	25.66	0.00
	Quadratic	-0.08	0.00	-24.73	0.00
Trajectory assignment probabilities					
Low-rate	(%)	79.15	1.01	78.61	0.00
Adolescent-Limited	(%)	9.82	0.82	11.94	0.00
Late-onset	(%)	8.31	0.67	12.31	0.00
High-rate	(%)	2.72	0.34	7.98	0.00
Model Diagnostics					
BIC	(N=27016)	-19209.92			
BIC	(N=2456)	-19191.94			
AIC		-19148.39			
L		-19133.39			

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Figure 10: Four-trajectory solution (ZIP: 2,2,2,2) for offenders born in 1984



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

1994 Trajectories

Table 16 presents the final four-group trajectory model which statistically summarises the trajectories of offenders born in 1994, complemented with a graphical depiction of these results in Figure 11. Again, for notational convenience each of the four trajectory groups has been assigned a name which best reflects the qualitative and quantitative nature of each trajectory. For consistency and comparative purposes, these names used to describe these trajectories are the same as those used for the 1984 cohort. These were: low rate, adolescent limited, late-onset and high-rate offenders.

A comparative analysis the 1984 and 1994 trajectories is provided in the following section. Here, our focus is on the trajectory assignment probabilities presented in Table 16, which reveal that the so-called low-rate offenders represented 70 percent of all those from the 1994 cohort who had contact with the criminal justice system. Further, adolescent limited offenders represented 17 percent of the offender cohort, while late-onset offenders represented nine percent (9.3%) and high-rate offenders represented four percent (3.7%). Compared to their counterparts born in 1984, low-rate offenders from 1994 now comprise a smaller fraction of all those who had contact with the criminal justice system by age 21 (70% vs. 79%), while adolescent-limited (16.8% vs. 9.8%), late-onset (9.3% vs. 8.3%) and high rate offenders (3.7% vs. 2.7%) represent relatively larger proportions.

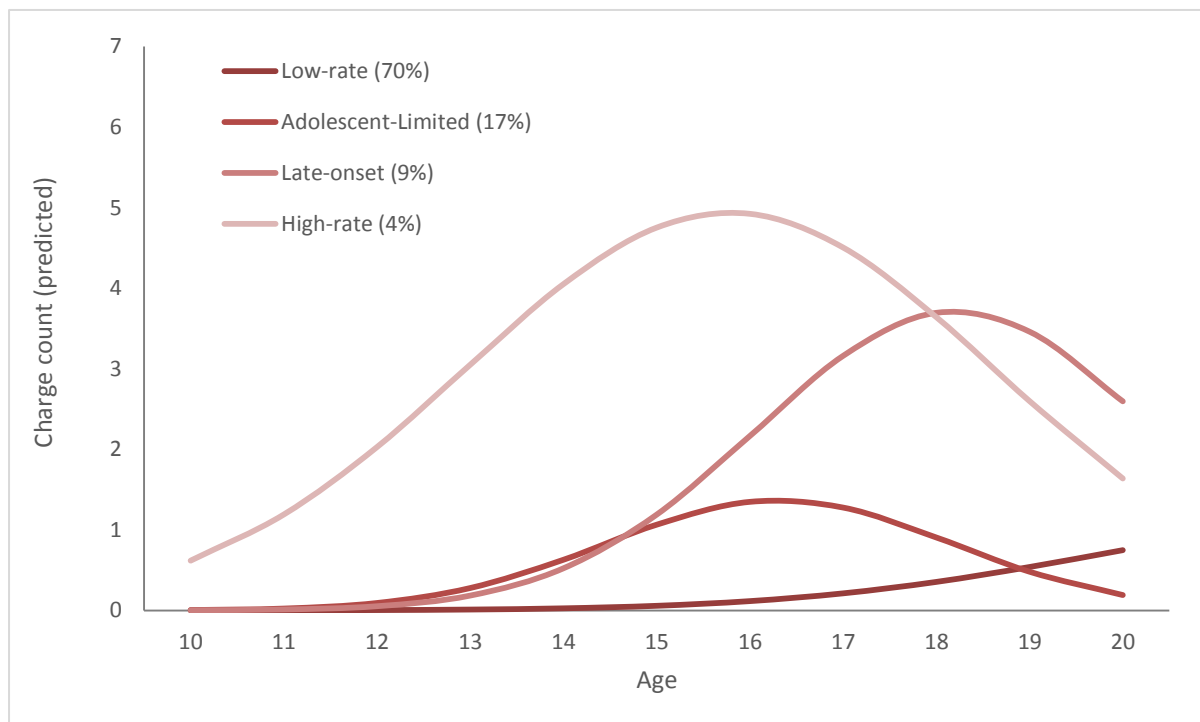
Table 16: Four-trajectory solution (ZIP: 2,2,2,2) for offenders born in 1984

		Estimate	S.E.	T	P
Model parameters					
Low-rate	Intercept	-9.02	0.62	-14.65	0.00
	Linear	1.31	0.14	9.37	0.00

Adolescent-Limited	Quadratic	-0.05	0.01	-5.89	0.00
	Intercept	-7.44	0.40	-18.41	0.00
	Linear	2.12	0.13	16.79	0.00
Late-onset	Quadratic	-0.15	0.01	-15.10	0.00
	Intercept	-8.08	0.48	-16.79	0.00
	Linear	2.04	0.12	17.15	0.00
High-rate	Quadratic	-0.11	0.01	-15.41	0.00
	Intercept	-1.26	0.16	-7.89	0.00
	Linear	0.84	0.05	16.70	0.00
	Quadratic	-0.06	0.00	-16.15	0.00
Trajectory assignment probabilities					
Low-rate	(%)	70.13	1.63	43.04	0.00
Adolescent-Limited	(%)	16.86	1.55	10.85	0.00
Late-onset	(%)	9.29	0.96	9.69	0.00
High-rate	(%)	3.72	0.54	6.90	0.00
Model Diagnostics					
BIC	(N=14762)	-11701.74			
BIC	(N=1342)	-11683.76			
AIC		-11644.74			
L		-11629.74			

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Figure 11: Four-trajectory solution (ZIP: 2,2,2,2) for offenders born in 1994

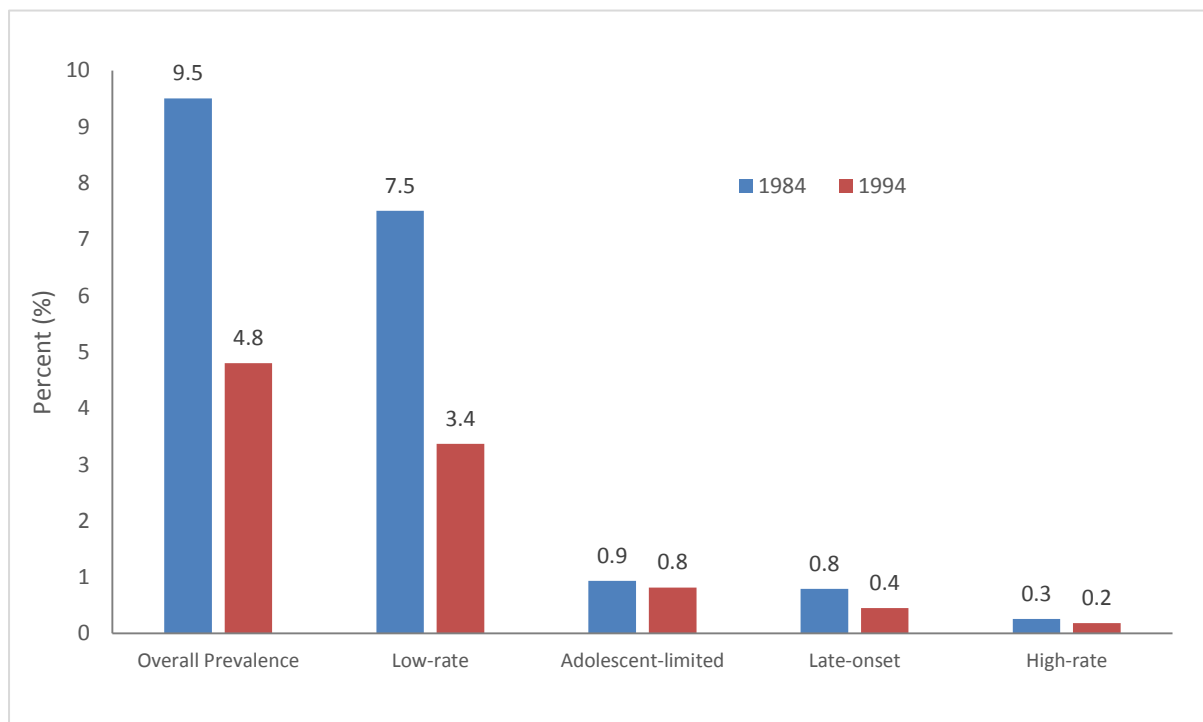


Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

To understand how these trajectory probabilities translate at the population level, it is possible to multiply these estimates by the overall prevalence rate to yield whole-of-cohort-level trajectory estimate. Figure 12, for example, multiplies the 1984 and 1994 trajectory membership probabilities by their relevant population prevalence rates of 9.5 and 4.8 percent, respectively. These data show that:

- Low-rate offenders represented approximately seven and a half percent (7.5%) of the total birth cohort born in 1984, but only three and a half percent of those born in 1994. In relative terms the proportion of the population identified as low-rate offenders fell by 55% between the 1984 and 1994 cohorts.
- Adolescent limited offenders represented just less than one percent of the 1984 (0.9%) and 1994 birth cohorts (0.8%). Proportional to population, the prevalence of adolescent limited offending fell by 13 percent – the smallest relative change between the two cohorts.
- The prevalence of late-onset offending almost halved between the 1984 and 1994 birth cohorts – down 44% from 0.8 to 0.4 percent of the population, respectively.
- Proportional to population, there was 31 percent fewer high-rate offenders in the 1994 birth cohort (0.2%) than in the 1984 birth cohort (0.3%).

Figure 12: Population prevalence of trajectories (1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Comparative analysis

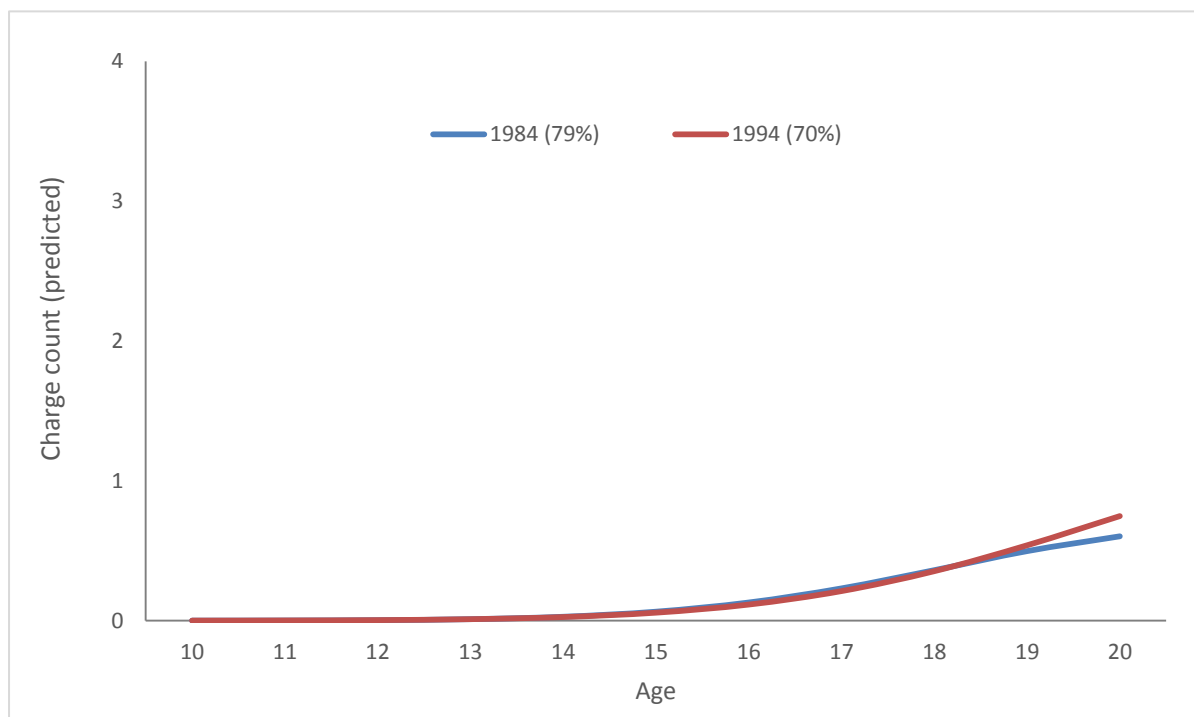
Individually, and notwithstanding the between-cohort shifts in assignment probabilities, the four trajectories graphically depicted in Figures 10 and 11 appear remarkably similar. Yet,

indistinguishable from these two separate plots are a number of important and notable differences which provide further insight into the changing nature of the offending population between the two cohorts. To examine these differences, Figures 13 through 16 compare the 1984 and 1994 trajectories separately, adjusting the scale of presentation to more effectively illustrate the comparative differences. In Figure 13 for example, the low-rate offender groups are depicted, showing an almost equivalent trajectory for the 1984 and 1994 cohorts. In Figure 14, the trajectory of adolescent limited offenders is compared, showing a modestly faster escalation and higher rate of peak offending for the 1984 cohort than was later seen for the equivalent group in the 1994 cohort.

The so-called late-onset offender trajectories are presented in Figure 15 where on average, despite a similar overall rate of escalation, it appears that in the 1994 cohort the onset of offending occurred one year earlier and peak of offending occurred 6 months earlier than was the case for their counterparts born in 1984. The near equivalent downward shift in offending at ages 19 and 20 suggests that not only did late onset offenders in 1994 start earlier, but they also accumulated a larger number of offences (on average) to age 21.

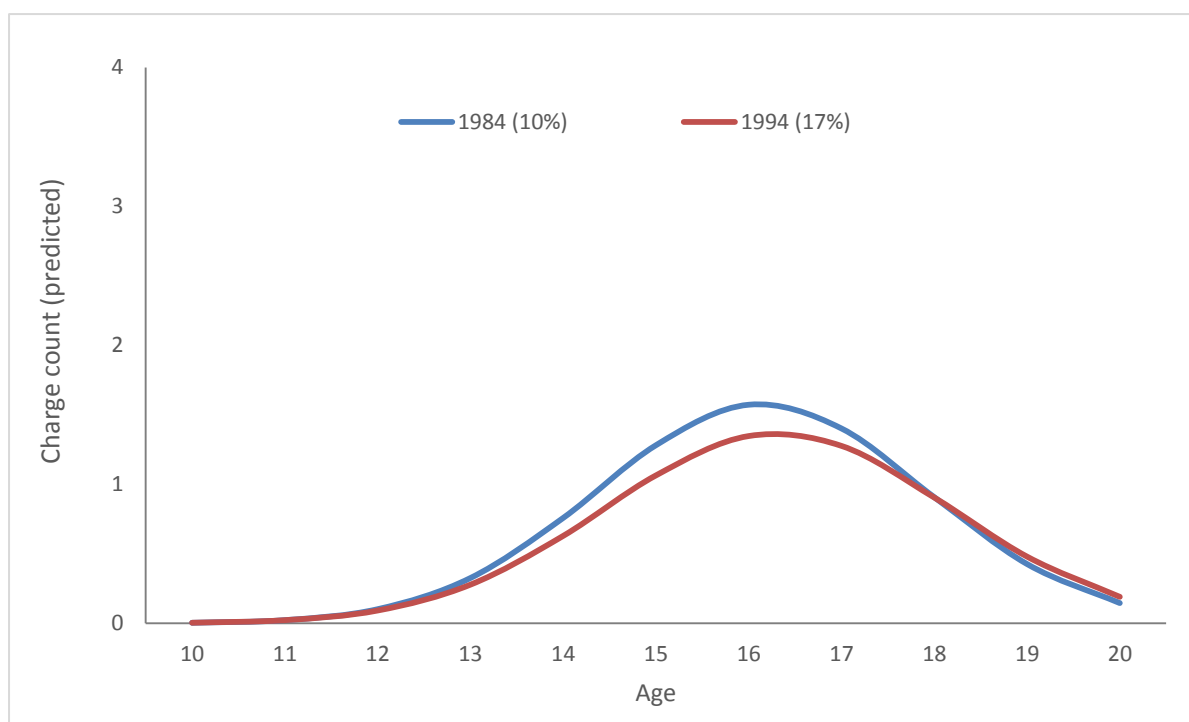
Finally, the trajectories of high rate offenders born in 1984 and 1994 are presented in Figure 16. It is here that we see some of the most significant differences between the two birth cohorts. Specifically, despite an earlier onset in 1994, the rate of escalation appears more modest for the later cohort, therefore resulting in a considerably lower rate of peak offending (4.9 offences per annum vs. 6.5 offences per annum). Overall, the trajectories suggest that high-rate offenders born in 1994 will have accumulated fewer offences by age 21 than was the case for their counterparts born in 1984.

Figure 13: Low-rate trajectory, predicted offence counts (1984 and 1994)



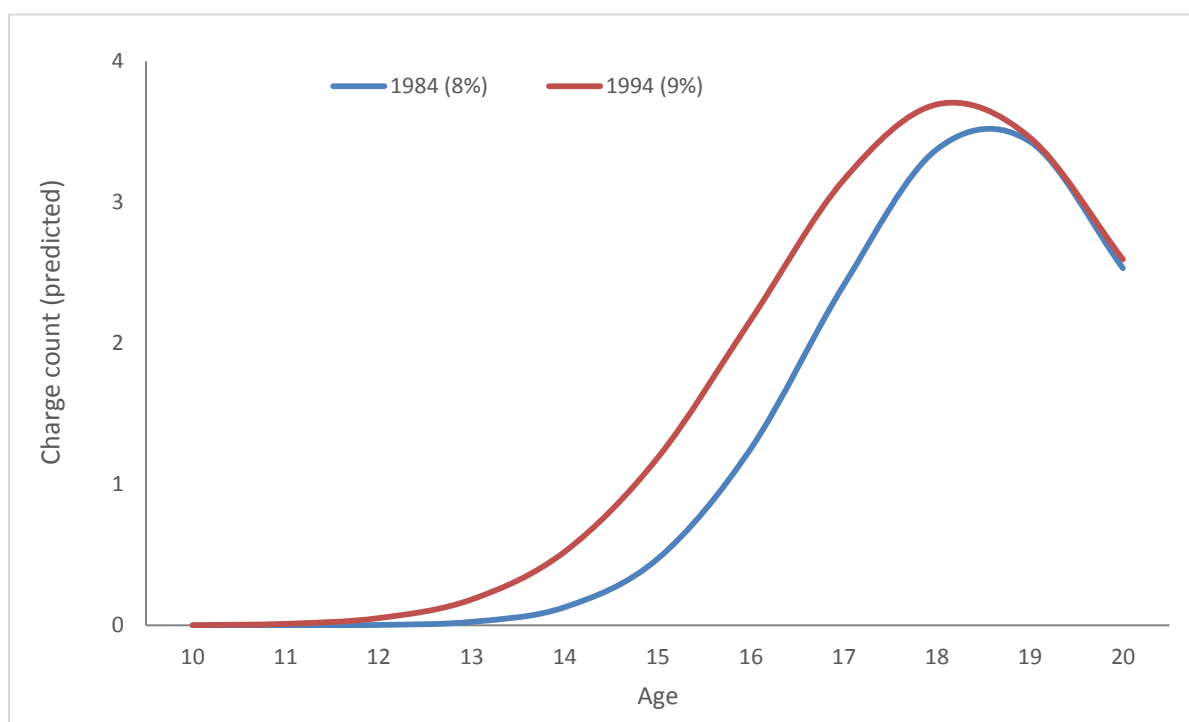
Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Figure 14: Adolescent Limited, predicted offence counts (1984 and 1994)



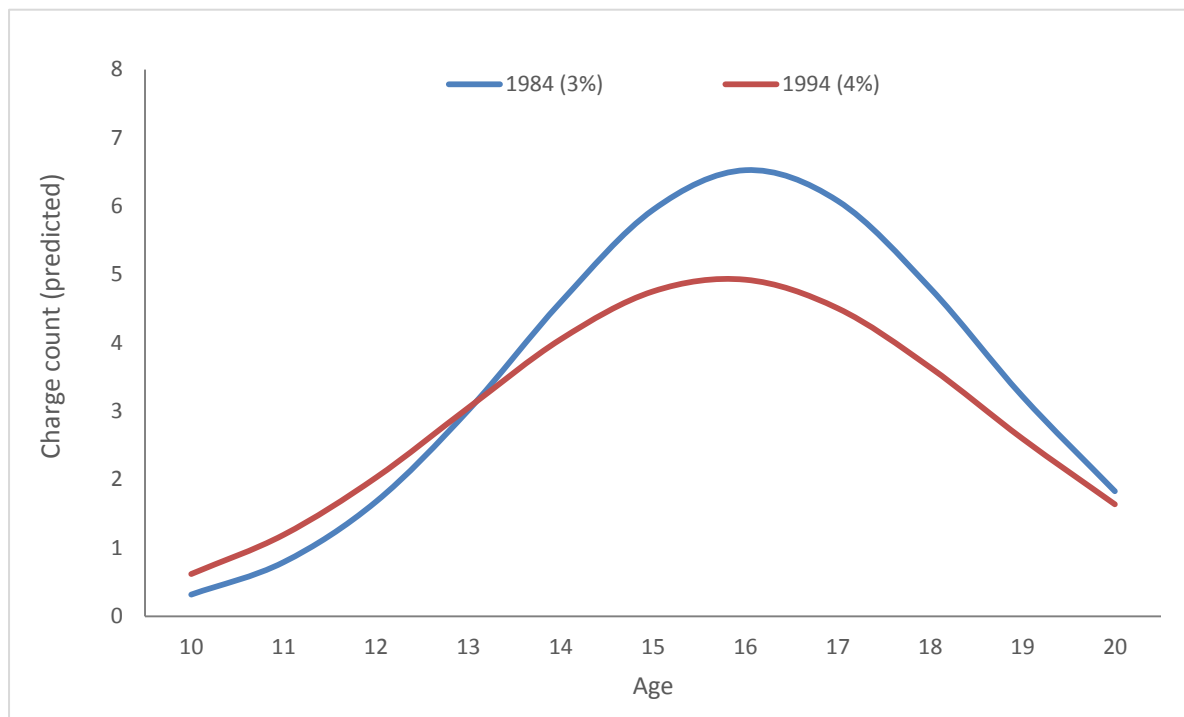
Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Figure 15: Late-onset, predicted offence counts (1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Figure16: High-rate, predicted offence counts (1984 and 1994)



Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Conclusion

This study examined the emerging criminal trajectories of two cohorts of individuals born in New South Wales. The first cohort was born in 1984 and reached their teens in an era of rising crime rates. The second cohort, born in 1994, grew up during the now well-documented crime-decline; an era when rates of crime in NSW and elsewhere in Australia were falling. Although the analysis of the Australian and international crime-decline has, to date, focused largely on macro-level factors using repeated cross-sectional or time-series data, this study considers the phenomenon from a developmental criminological perspective – looking for both causes and potential consequences.

The findings of this study have identified some important differences between these two cohorts. Most notably:

- Born ten years apart, the population prevalence of offending for the 1994 cohort was considerably lower than was estimated for their peers born in 1984. Proportional to population, the number of young people having contact with the criminal justice system by age 21 had almost halved.
- The greatest overall declines in offending were seen for property crime (-56%), drink driving (-49%) and disorder offences (-42%). Conversely, rates of criminal justice breaches rose by 43 percent.
- Though fewer people born in 1994 had contact with the police, of those who did, their offending tended to be at a higher rate (by a third more).
- The proportion of the offenders categorised as 'chronic' (on the basis of committing five or more offences by age 21) increased between the two cohorts.
- Prevalence of Indigenous offending also declined between 1984 and 1994 and while Indigenous young people from the 1994 birth cohort remained over-represented in police data, the degree of over-representation declined by 17 percent. These declines were almost exclusively for violence, drug, drink driving and disorderly conduct offences, while the relative over-representation of Indigenous young people actually increased for property offending.
- As trajectories of offending, the prevalence of low-rate offending (ie the proportion of the population that was low rate) declined the most significantly between 1984 and 1994. Those that might be identified as high-rate offenders had lower rates of offending in 1994 overall, while late-onset offenders in 1994 had started their offending earlier on average.

These findings require some further explanation. First, the decline in the prevalence of offending highlights the fact that during the crime decline there were far fewer young people ever becoming involved in crime. As a proportion of the population, those committing just one or two offences by age 21 had almost halved over the 10 years (from 3.9 percent of the population, to 1.7 percent). If one examines the type of offence committed at the age of onset of offending (as an indicator of what drew young people into crime), it is clear that property offending has declined more significantly than any other crime type - an overall reduction of 22 percent. Offsetting this decline in property offences as the point of first involvement in crime, other crime times have become relatively more common as the offence of onset. This includes violent offences (+28%), drug offences (+38%), traffic offences (+12%) and disorder offences (+14%).

Decline in volume, but increase in apparent chronicity

A large decline in the frequency of offending has been observed across the board, with most offence types (with the exception of drug and breach offences) experiencing large reductions. This, however, would appear to have been largely due to the reduction in prevalence, given that the concentration of offending (average offences per offender) rose for most ages and for most crime types in the 1994 cohort. This apparent decrease in rates of offending is, therefore, an artefact of the disappearance of a large cohort of low-rate offenders and it is here that the longitudinal trajectory analysis provides some useful insights. In particular, we note that the relative quantity of crimes committed by late-onset offenders (those who first contact the criminal justice system in late-adolescence or early adulthood) increased for the 1994 cohort, while the opposite was true of the high-rate offenders.

Increase in criminal justice breaches

The cumulative number of breaches by the age of 21 rose by 171 percent between the two cohorts, while the average number of breaches per offender increased by 90 percent. This is likely to be a function of the apparent concentration of more serious offenders in the 1994 cohort, who may be more likely to reoffend and fail to comply with the requirements of their orders and other sanctions. So, while the overall amount of offending and the number of offenders has declined, the residual group may be more difficult to supervise. This could have implications for the justice system in terms of the increased likelihood of this cohort receiving a custodial sentence following the failure to comply with other sanctions. This is an issue that would be worthy of further exploration.

Indigenous

Although well documented, the over-representation of young Indigenous offenders in both cohorts is cause for concern. However, that the relative over-representation declined (by 17%) between the two cohorts is a positive finding. Overall, the prevalence of criminal justice contact declined more rapidly for Indigenous young people than for their non-Indigenous counterparts, however this was not universal for all crime types. Specifically, the considerable declines in property offending seen at the outset of this report were not as large for the Indigenous population and, as a consequence, the relative overrepresentation of Indigenous offenders apprehended for property crimes has, in fact, increased.

In some ways, these data help to shed further light on the possible drivers of the crime decline by casting light on the differential experiences of some of our most socially and financially disadvantaged populations. In particular, to the extent that property crime is committed for personal and financial gain, the fact that these types of offences didn't decline as sharply amongst the Indigenous population might suggest that they weren't as much the beneficiaries of recent economic and fiscal improvements in Australia. This increasing disadvantage may help to explain the why property offending has not declined as dramatically for the Indigenous population, either because more young people are propelled into crime out of necessity, or because informal markets for stolen goods remain more potent within disadvantaged communities. Of course, there are many other cultural and social issues too difficult to disentangle from these data alone and future analyses by geographical locations may be of value in progressing our understanding of the crime decline and its developmental consequences.

Concluding remarks

This study has provided a unique insight into the NSW crime decline. It lends weight to a number of competing hypotheses which only a more detailed qualitative and quantitative analysis will be able to disentangle. Nevertheless, we conclude with a number of important comments and observations

which might help to drive both a future research agenda and the development of policy in the context of the crime decline.

First, not only is there less crime, there are fewer offenders coming into the system and therefore down the criminal justice pipeline. How we respond, both in terms of funding and policy prioritisation in the criminal justice system will be a significant challenge going forward.

Second, those who remain in the system will appear *relatively* more chronic and serious even if they aren't fundamentally different from those of cohorts past. We must, therefore, resist the temptation to increase criminal justice resources only to maintain the status quo. Instead, Government agencies should be looking to innovate, evaluate and make more effective the criminal justice system for an equivalent or lower cost.

Third, the displacement of crime and antisocial conduct into the online environment is a real possibility and one that requires much more attention. To be clear, displacement should not always be considered an adverse outcome. If for once-off and adolescent-limited offender these minor forms of online antisocial behaviour have replaced more serious and consequential forms of offending, then this may be a preferable alternative and shouldn't immediately demand additional surveillance and formal intervention. However, if displacement is to more serious, potentially more entrenched forms of antisocial behaviour online, then the ramifications could be significant.

Finally, Indigenous over-representation requires considered policy action because, although over-representation declined by 17 percent, young Indigenous Australians in NSW were still three times more likely to have contact with the police by the age of 21.

References

- Australian Institute of Criminology (2012) Australian crime: Facts and figures 2011. Canberra: Australian Institute of Criminology
- Australian Institute of Criminology (2016) Australian crime: Facts and figures 2014. Canberra: Australian Institute of Criminology
- Becker, G.S. (1974) Crime and punishment: an economic approach. In G.S. Becker (ed) *Essays in the economics of crime and punishment*. New York: National Bureau of Economic Research, pp.1-54
- Blumstein, A., Cohen, J. and Miller, H. (1980) Demographically disaggregated projects of prison populations. *Journal of Criminal Justice*, 8, pp.1-25
- Box, S. (1987) *Recession, crime and punishment*. Basingstoke: Macmillan Education.
- Brown, R. (2015a) *Explaining the property crime drop: The offender perspective*. Trends and issues in Crime and Justice, No. 495. Canberra: Australian Institute of Criminology
- Brown, R. (2015b) Reviewing the effectiveness of electronic vehicle immobilisation: Evidence from four countries. *Security Journal*, 28(4), pp.329-351.
- Clancey, G. and Lulham, R. (2014) The New South Wales property crime decline. *Current Issues in Criminal Justice*, 25(3), pp.839–851.
- Dietrich, K.N., Douglas, R.M., Succopa, P.A., Bergerb, O.G. and Bornschein, R.L. (2001) Early exposure to lead and juvenile delinquency. *Neurotoxicology and Teratology*, 23(6), p.511-518.
- Donohoe, J.J. (2009) Assessing the relative benefits of incarceration: The overall change over the previous decades and the benefits on the margin. In S. Raphael and M. Stoll (eds) *Do prisons make us safer? The benefits and costs of the prison boom*, New York: Russell Safe Foundation, pp.269-341.
- Donohue, J.J. and Levitt, S.D. (2001) The impact of legalised abortion on crime. *The Quarterly Journal of Economics*, 116(2), pp.379-420.
- Durlauf, S.N. and Nagin, D.S. (2011) Imprisonment and crime: can both be reduced? *Criminology and Public Policy*, 10(1), pp.13-54
- Eck, J.E. and Madensen, T. (2009) Using Signatures of Opportunity Structures to Examine Mechanisms in Crime Prevention Evaluations. In J. Knutsson and N.Tilley (eds) *Evaluating Crime Prevention Initiatives*. Monsey, NY: Criminal Justice Press.
- Farrell, G. (2013) Five tests for a theory of the crime drop. *Crime Science*, 2(5), DOI: 10.1186/2193-7680-2-5.
- Farrell, G. and Brown, R. (2016) On the Origins of the Crime Drop: Vehicle Crime and Security in the 1980s. *The Howard Journal of Crime and Justice*, DOI: 10.1111/hojo.12158.

Farrell, G., Laycock, G. and Tilley, N. (2015) Debut and legacies: the crime drop and the role of adolescence-limited and persistent offending. *Crime Science*, 4(16), DOI: 10.1186/s40163-015-0028-3

Farrell, G., Tilley, N., Tseloni, A. and Mailley, J. (2010) Explaining and sustaining the crime drop: Clarifying the role of opportunity-related theories. *Crime Prevention and Community Safety*, 12(1), pp.24-41.

Farrell, G., Tseloni, A., Mailley, J. and Tilley, N. (2011a) The crime drop and the security hypothesis. *Journal of Research in Crime and Delinquency* 48(2), pp.147–175.

Farrell, G., Tseloni, A. and Tilley, N. (2011b) The effectiveness of vehicle security devices and their role in the crime drop. *Criminology and Criminal Justice*, 11(1), pp.21-35.

Fox, J.A. (1978) *Forecasting crime data: An economic analysis*. Lexington MA: Lexington Books

Fox, J.A. (2006) Demographics and U.S. homicide. In A. Blumstein and J. Wallman (eds) *The crime drop in America: Revised edition*. Cambridge: Cambridge University Press, pp. 288-346.

Gottfredson, M. and Hirschi, T. (1990) *A general theory of crime*. Stanford: Stanford University Press

Grogger, J. (2006) An economic model of recent trends in violence. In A. Blumstein and J. Wallman (eds) *The crime drop in America: Revised edition*. Cambridge: Cambridge University Press, pp. 266-287.

Hanslmaier, M., Kemme, S., Stoll, K. and Baier, D. (2015) Forecasting crime in Germany in times of demographic change. *European Journal of Criminal Policy and Research*, 21(4), pp.591-610.

Johnson, B.D., Golub, A. and Dunlap, E. (2006) The rise and decline of hard drugs, drug markets, and violence in inner-city New York. In A. Blumstein and J. Wallman (eds) *The crime drop in America: Revised edition*. Cambridge: Cambridge University Press, pp. 164-206.

Kriven, S. and Ziersch, E. (2007) New car security and shifting vehicle theft patterns in Australia. *Security Journal*, 20(2), pp.111-122.

Levitt, S.D. (2004) Understanding why crime fell in the 1990s: Four factors explain the decline and six that do not. *Journal of Economic Perspectives*, 18(1), pp.163-190.

Liedka, R., Piehl, A. and Useem, B. (2006) The crime-control effect of incarceration: Does scale matter? *Criminology and public policy*, 5(2), pp. 245-276.

Mayhew, P. (2012) The case of Australia and New Zealand. In J Van Dijk, A. Tseloni and G. Farrell (eds), *The international crime drop: New directions in research*. Basingstoke, England: Palgrave Macmillan, pp.76-102.

Marvell, T.B., Moody, C. (1994) Prison population growth and crime reduction. *Journal of Quantitative Criminology* 10(2), pp.109-140.

Moffatt, S., Weatherburn, D. and Donnelly, N. (2005) *What caused the recent drop in property crime?* Contemporary Issues in Crime and Justice, No. 85. Sydney: NSW Bureau of Crime Statistics and Research.

- Morgan, N. (2014) *The heroin epidemic of the 1980s and 1990s and its effect on crime trends - then and now: Technical Report*. London: Home Office.
- MM Starrs Pty Ltd. (2002) *Principles for compulsory immobiliser schemes*. Melbourne: National Motor Vehicle Theft Reduction Council.
- National Motor Vehicle Theft Reduction Council (2007) *The Effectiveness of immobilisers in preventing vehicle theft in Australia*. CARS Brief Report, April 2007. Melbourne: National Motor Vehicle Theft Reduction Council.
- Ousey, G.C. and Kubrin, C.E. (2009) Exploring the connection between immigration and violent crime rates in US cities, 1980-2000. *Social Problems*, 56(3), pp.447-473.
- Potter, R. and Thomas, P. (2001) Engine immobilisers: How effective are they? South Australia: National Motor Vehicle Theft Reduction Council.
- Raphael, S. and Winter-Ebmer, R. (2001) Identifying the effect of unemployment on crime. *Journal of Law and Economics*, 44, pp.259-283.
- Roeder, O., Eisen, L.B. and Bowling, J. (2013) *What caused the crime decline?* New York: Brennan Centre for Justice.
- Sampson, R.J. (2008) Rethinking immigration and crime. *Contexts: Understanding people in their social worlds*, 7(1), pp.28-33.
- Sampson, R.J., and Bean, L. (2006) Cultural mechanisms and killing fields: A revised theory of community level racial inequality. In R. Peterson, L. Krivo and J. Hagan (eds) *The many colours of crime: Inequality of race, ethnicity and crime in America*, New York: New York University Press, pp.8-36.
- Shaw, C.R. and McKay, H.D. (1942) *Juvenile delinquency and urban areas*. Chicago: University of Chicago Press.
- Spelman, W. (1994) *Criminal incapacitation*. New York: Plenum Press.
- Spelman, W. (2000) What recent studies do (and don't) tell us about imprisonment and crime. In M. Tonry (ed) *Crime and justice: A review of research*, Vol.27. Chicago: University of Chicago Press pp.419-494.
- Stowell, J.I, Messner, S.F., McGeever, K.F. and Raffalovich, L.E. (2009) Immigration and the recent violent crime drop in the United States: A pooled, cross-sectional time-series analysis of metropolitan areas. *Criminology*, 47(3), pp.889-928.
- Trussler, T. (2012) Demographics and homicide in Canada: A fixed-effects analysis of the role of young males on changing homicide rates. *Western Criminology Review*, 13(1), pp.53-67.
- Tseloni, A., Farrell, G., Tilley, N., Grove, L., Thompson, R. and Garius, L. (2012) Towards a comprehensive research plan on opportunity theory and the crime drop. In J Van Dijk, A. Tseloni and

G. Farrell (eds), *The international crime drop: New directions in research*. Basingstoke, England: Palgrave Macmillan, pp.286-299

Tseloni, A., Thompson, R., Grove, L., Tilley, N., and Farrell, G. (2014) The effectiveness of burglary security devices. *Security Journal*, advance online publication doi: 10.1057/sj.2014.30.

van Dijk, J. and Tseloni, A. (2012) Global overview: International trends in victimisation and recorded crime. . In J Van Dijk, A. Tseloni and G. Farrell (eds), *The international crime drop: New directions in research*. Basingstoke, England: Palgrave Macmillan, pp.11-36.

van Dijk, J. and Vollaard, B. (2012) Self-limiting crime waves. In J Van Dijk, A. Tseloni and G. Farrell (eds), *The international crime drop: New directions in research*. Basingstoke, England: Palgrave Macmillan, pp.250-267.

Wadsworth, T. (2010) Is immigration responsible for the crime drop? An assessment of the influence of immigration on changes in violent crime between 1990 and 2000. *Social Science Quarterly*, 91(2), pp.531-553

Wan, W.Y., Moffatt, S., Jones, C. and Weatherburn, D. (2012) *The effect of arrest and imprisonment on crime*. Contemporary Issues in Crime and Justice, No. 158. Sydney: NSW Bureau of Crime Statistics and Research.

Weatherburn, D. Freeman, K., and Holmes, J. (2014) *Young but not so restless: Trends in the age-specific rate of offending*. Crime and Justice Statistics. Issue Paper No.98. NSW Bureau of Crime Statistics and Research: Sydney.

Weatherburn, D. and Holmes, J. (2013a) *The decline in robbery and theft: Inter-state comparisons*. Crime and Justice Statistics Bureau Brief No. 89. Sydney: NSW Bureau of Crime Statistics and Research.

Weatherburn, D. and Holmes, J. (2013b) *The great property crime drop: a regional analysis*. Crime and Justice Statistics Bureau Brief No. 88. Sydney: NSW Bureau of Crime Statistics and Research.

Weatherburn, D., Halstead, I. and Ramsey, S. (2016) The great (Australian) property crime decline. *The Australian Journal of Social Issues*, 51 (3), pp.257-278

Wolpaw Reyes, J. (2007) Environmental policy as social policy? The impact of childhood lead exposure on crime. *The B.E. Journal of Economic Analysis & Policy*, 7(1) DOI: 10.2202/1935-1682.1796, October 2007.

Zimring, F.E. (2007) *The great American crime decline*. Oxford: Oxford University Press.

Zimring, F.E. (2012) *The city that became safe: New York's lessons for urban crime and its control*. Oxford: Oxford University Press.

Appendix A: Detailed Tables

Table A1.1: Annual number of unique offenders by offence type and age (1984 and 1994)

1984											
	10	11	12	13	14	15	16	17	18	19	20
Violent	5	10	28	71	182	266	346	446	594	602	541
Assault	0	2	7	19	51	86	123	170	260	262	239
Sex	1	1	3	6	6	11	8	6	11	11	7
Robbery	3	0	1	8	25	54	49	91	72	44	27
Other violent	4	7	18	49	124	166	220	262	346	371	334
Property	7	18	75	158	430	683	789	851	906	792	655
Burglary	4	4	31	63	170	236	237	253	216	172	126
SMV	0	3	13	42	89	164	226	239	182	107	70
Stealing	6	14	46	99	256	396	416	417	460	379	286
Other property	0	3	6	25	87	117	189	249	292	336	292
Drug	0	3	4	17	86	113	153	259	318	368	364
Drink	0	0	0	1	1	11	38	188	501	792	720
Traffic	1	1	5	14	44	101	179	354	680	796	979
Disorder	5	14	35	108	221	371	466	588	801	836	699
Breach	0	2	7	12	27	57	68	93	155	186	175
Other	1	1	6	19	50	81	89	148	227	236	257
Any	12	31	110	269	777	1147	1414	1877	2761	3137	3014
Any (excl. breaches)	12	31	108	268	776	1141	1408	1870	2746	3118	3002
1994											
	10	11	12	13	14	15	16	17	18	19	20
Violent	1	16	40	92	214	281	339	389	434	409	375
Assault	0	5	9	26	70	89	145	150	181	170	140
Sex	0	0	1	1	5	3	4	14	10	6	3
Robbery	0	1	0	13	27	46	52	42	34	29	11
Other violent	1	11	33	68	146	184	198	235	273	266	256
Property	13	46	84	176	311	411	463	449	368	324	233
Burglary	6	21	41	70	110	144	165	150	104	82	51
SMV	1	8	14	27	59	85	92	74	65	43	24
Stealing	6	28	52	115	209	247	270	236	180	156	104
Other property	1	6	12	26	57	61	82	111	128	136	109
Drug	0	2	6	13	17	56	102	142	266	415	419
Drink	0	0	0	0	1	6	30	100	295	374	380
Traffic	0	3	5	16	36	87	152	275	484	554	577

Disorder	14	39	67	128	283	376	445	452	450	441	391
Breach	0	2	7	24	81	135	175	233	280	303	268
Other	2	3	11	18	51	68	90	140	175	196	179
Any	22	71	144	292	566	808	996	1184	1610	1875	1823
Any (excl. breaches)	22	71	144	291	562	803	992	1172	1599	1864	1808

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table A1.2: Annual number of unique offenders by offence type and age (Males, 1984 and 1994)

1984											
	10	11	12	13	14	15	16	17	18	19	20
Violent	4	10	25	59	134	203	275	370	511	518	457
Assault	0	2	6	16	36	62	93	144	215	229	201
Sex	1	1	3	6	6	11	8	6	11	11	7
Robbery	3	0	0	7	22	39	35	70	66	38	26
Other violent	3	7	17	40	86	123	177	217	303	320	286
Property	7	18	66	126	342	547	647	726	748	645	491
Burglary	4	4	27	55	151	208	219	232	196	162	116
SMV	0	3	12	36	75	137	202	218	167	96	61
Stealing	6	14	40	75	200	306	319	342	372	302	198
Other property	0	3	5	19	70	97	157	200	228	259	206
Drug	0	3	3	16	72	99	131	228	287	335	325
Drink	0	0	0	1	1	8	28	165	426	676	592
Traffic	1	1	5	11	39	87	162	330	613	725	857
Disorder	5	12	35	90	178	302	396	506	717	750	625
Breach	0	2	7	9	22	45	55	73	134	163	161
Other	0	1	5	17	41	65	68	122	185	206	217
Any	10	29	98	220	616	927	1155	1604	2360	2688	2518
Any (excl. breaches)	10	29	96	219	615	921	1151	1601	2348	2673	2507
1994											
	10	11	12	13	14	15	16	17	18	19	20
Violent	1	15	34	75	166	214	268	318	361	350	313
Assault	0	5	7	19	45	60	105	124	148	144	111
Sex	0	0	1	1	5	3	4	14	10	4	3
Robbery	0	1	0	11	26	38	44	38	34	28	10
Other violent	1	10	29	55	112	141	161	186	228	226	219
Property	12	44	71	148	250	341	393	378	323	271	186
Burglary	6	21	39	66	102	135	154	139	102	74	46
SMV	1	8	13	25	50	77	86	65	62	37	16

Stealing	5	26	40	96	163	191	215	192	154	129	83
Other property	1	6	12	23	46	49	67	91	110	111	85
Drug	0	2	5	11	15	53	90	129	246	371	365
Drink	0	0	0	0	1	6	29	86	236	302	319
Traffic	0	3	5	15	32	77	136	229	416	476	476
Disorder	14	39	62	110	246	332	376	397	408	391	350
Breach	0	2	7	23	66	117	151	205	253	266	231
Other	2	3	10	14	36	53	69	119	148	165	153
Any	21	68	122	240	463	670	822	986	1348	1583	1523
Any (excl. breaches)	21	68	122	239	461	668	819	978	1337	1575	1511

Table A1.3: Annual number of unique offenders by offence type and age (Females, 1984 and 1994)

Robbery	0	0	0	2	1	8	8	4	0	1	1
Other violent	0	1	4	13	34	43	37	49	45	40	37
Property	1	2	13	28	61	70	70	71	45	53	47
Burglary	0	0	2	4	8	9	11	11	2	8	5
SMV	0	0	1	2	9	8	6	9	3	6	8
Stealing	1	2	12	19	46	56	55	44	26	27	21
Other property	0	0	0	3	11	12	15	20	18	25	24
Drug	0	0	1	2	2	3	12	13	20	44	54
Drink	0	0	0	0	0	0	1	14	59	72	61
Traffic	0	0	0	1	4	10	16	46	68	78	101
Disorder	0	0	5	18	37	44	69	55	42	50	41
Breach	0	0	0	1	15	18	24	28	27	37	37
Other	0	0	1	4	15	15	21	21	27	31	26
Any	1	3	22	52	103	138	174	198	262	292	300
Any (excl. breaches)	1	3	22	52	101	135	173	194	262	289	297

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table A1.4: Annual number of unique offenders by offence type and age (Indigenous offenders, 1984 and 1994)

1984											
	10	11	12	13	14	15	16	17	18	19	20
Violent	3	5	19	38	90	117	124	153	208	171	176
Assault	0	1	4	10	33	43	53	68	108	84	82
Sex	1	0	2	1	1	6	1	2	5	3	2
Robbery	2	0	1	4	13	23	17	29	18	11	12
Other violent	2	4	12	30	61	73	78	92	132	113	108
Property	4	12	45	86	169	223	242	235	237	202	181
Burglary	2	2	19	39	79	97	93	99	85	55	50
SMV	0	2	7	27	48	69	85	77	57	40	27
Stealing	3	10	30	52	105	128	128	113	122	97	88
Other property	0	3	2	15	39	49	64	78	63	75	63
Drug	0	3	2	7	25	39	37	57	59	64	54
Drink	0	0	0	1	0	8	9	25	53	64	39
Traffic	1	0	3	10	22	39	69	75	103	128	161
Disorder	3	11	18	63	111	165	152	201	248	221	192
Breach	0	2	5	7	22	33	36	52	66	68	59
Other	0	1	3	14	28	47	35	66	84	62	64

Any	7	19	62	135	260	367	389	418	538	534	517
Any (excl. breaches)	7	19	61	135	259	365	388	415	536	527	513
1994											
	10	11	12	13	14	15	16	17	18	19	20
Violent	1	11	27	54	104	142	141	146	145	128	105
Assault	0	4	8	15	38	48	64	70	69	64	42
Sex	0	0	1	0	1	1	1	2	3	0	0
Robbery	0	1	0	10	10	26	27	23	13	11	3
Other violent	1	6	20	41	74	90	79	78	86	84	69
Property	10	42	57	96	171	190	202	179	130	101	87
Burglary	5	19	30	39	76	72	86	67	52	30	25
SMV	1	7	12	23	40	42	38	37	31	23	14
Stealing	4	27	38	67	104	117	100	86	60	56	36
Other property	1	6	11	20	39	34	39	47	39	34	42
Drug	0	0	3	7	4	22	27	42	46	55	51
Drink	0	0	0	0	1	1	3	20	21	24	25
Traffic	0	2	4	11	18	34	44	77	85	101	99
Disorder	10	29	49	70	135	165	190	183	152	132	117
Breach	0	2	6	18	55	86	85	109	105	103	97
Other	1	0	6	13	36	41	44	63	65	67	62
Any	16	52	90	143	262	328	350	366	343	329	319
Any (excl. breaches)	16	52	90	143	260	327	350	364	340	327	314

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table A2.1: Cumulative prevalence of offending by offence type and age (1984 and 1994)

1984											
	10	11	12	13	14	15	16	17	18	19	20
Violent	5	14	38	98	262	488	751	1064	1455	1846	2162
Assault	0	2	8	24	69	148	256	392	602	798	975
Sex	1	2	5	11	17	28	35	40	50	61	67
Robbery	3	3	4	12	37	86	129	207	264	295	319
Other violent	4	10	26	69	186	331	505	708	959	1233	1459
Property	7	22	86	215	550	1037	1522	2029	2511	2891	3207
Burglary	4	8	36	93	243	430	591	752	880	970	1030
SMV	0	3	15	54	132	263	438	609	730	792	830
Stealing	6	17	57	139	350	666	951	1238	1541	1769	1934
Other property	0	3	9	32	112	218	380	578	820	1067	1283

Drug	0	3	7	23	109	213	350	571	829	1121	1384
Drink	0	0	0	1	2	13	50	235	724	1468	2092
Traffic	1	2	6	19	60	146	300	598	1184	1791	2496
Disorder	5	17	48	143	326	600	930	1301	1856	2370	2748
Breach	0	2	7	17	43	91	141	210	336	477	598
Other	1	2	8	27	74	147	223	340	532	730	935
Any	12	37	129	339	959	1706	2531	3558	5056	6624	7900
Any (excl. breaches)	12	37	127	337	958	1701	2526	3552	5044	6613	7887
1994											
	10	11	12	13	14	15	16	17	18	19	20
Violent	1	16	46	123	302	479	699	932	1164	1378	1571
Assault	0	5	12	35	96	169	286	395	533	646	748
Sex	0	0	1	2	6	8	12	25	34	40	42
Robbery	0	1	1	14	38	75	113	142	165	188	196
Other violent	1	11	36	98	229	360	504	667	843	1004	1152
Property	13	52	109	229	446	689	941	1153	1299	1434	1512
Burglary	6	24	55	107	191	289	394	477	528	572	594
SMV	1	8	20	41	88	152	223	282	325	350	363
Stealing	6	32	73	159	326	491	674	810	908	982	1028
Other property	1	6	15	37	87	135	202	295	393	493	559
Drug	0	2	8	20	36	90	183	304	519	859	1163
Drink	0	0	0	0	1	7	37	137	425	784	1135
Traffic	0	3	8	21	53	129	263	498	901	1296	1687
Disorder	14	48	95	189	399	627	875	1101	1309	1531	1707
Breach	0	2	8	30	98	187	292	439	596	770	916
Other	2	5	16	32	76	126	201	306	436	571	709
Any	22	80	175	374	732	1142	1569	2057	2786	3622	4341
Any (excl. breaches)	22	80	175	374	729	1136	1564	2047	2777	3613	4332

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table A2.2: Cumulative prevalence of offending by offence type and age (Males, 1984 and 1994)

1984											
	10	11	12	13	14	15	16	17	18	19	20
Violent	4	13	34	83	203	374	582	843	1186	1524	1785
Assault	0	2	7	20	51	109	192	309	483	659	804
Sex	1	2	5	11	17	28	35	40	50	61	67
Robbery	3	3	3	10	32	67	96	159	211	239	262
Other violent	3	9	24	58	138	245	384	551	769	1005	1194
Property	7	22	77	178	437	823	1210	1645	2026	2324	2537
Burglary	4	8	32	81	212	373	518	661	773	855	909
SMV	0	3	14	47	113	221	376	529	638	694	725
Stealing	6	17	51	112	272	515	733	975	1215	1393	1501
Other property	0	3	8	26	90	176	309	469	656	848	998
Drug	0	3	6	21	93	183	298	490	723	985	1218
Drink	0	0	0	1	2	10	37	199	613	1250	1750
Traffic	1	2	6	16	52	125	263	539	1060	1607	2206
Disorder	5	15	46	123	271	488	764	1081	1578	2038	2372
Breach	0	2	7	14	35	72	113	168	279	405	516
Other	0	1	6	23	61	119	176	273	434	611	784
Any	10	33	113	281	765	1365	2031	2909	4163	5461	6450
Any (excl. breaches)	10	33	111	279	764	1360	2027	2905	4154	5454	6441
1994											
	10	11	12	13	14	15	16	17	18	19	20
Violent	1	15	40	102	239	374	545	732	920	1107	1267
Assault	0	5	10	27	66	119	203	291	401	495	577
Sex	0	0	1	2	6	8	12	25	34	38	40
Robbery	0	1	1	12	35	64	95	120	143	165	172
Other violent	1	10	32	81	181	280	395	521	671	808	934
Property	12	49	93	188	354	545	751	925	1053	1161	1223
Burglary	6	24	53	101	177	266	362	437	487	526	546
SMV	1	8	19	38	77	133	198	249	289	310	317
Stealing	5	29	58	127	254	373	516	626	715	777	815
Other property	1	6	15	34	74	112	165	240	325	401	454
Drug	0	2	7	17	31	82	165	275	471	774	1033
Drink	0	0	0	0	1	7	36	122	351	640	933
Traffic	0	3	8	20	48	114	233	425	768	1099	1407
Disorder	14	48	90	167	345	544	748	942	1123	1311	1467
Breach	0	2	8	29	82	158	244	370	511	654	778
Other	2	5	15	27	56	96	154	246	359	471	588

Any	21	76	150	306	594	923	1265	1657	2250	2933	3511
Any (excl. breaches)	21	76	150	306	593	921	1263	1653	2244	2928	3506

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table A2.3: Cumulative prevalence of offending by offence type and age (Females, 1984 and 1994)

1984											
	10	11	12	13	14	15	16	17	18	19	20
Violent	1	1	4	15	59	114	169	221	269	322	377
Assault	0	0	1	4	18	39	64	83	119	139	171
Sex	0	0	0	0	0	0	0	0	0	0	0
Robbery	0	0	1	2	5	19	33	48	53	56	57
Other violent	1	1	2	11	48	86	121	157	190	228	265
Property	0	0	9	37	113	214	312	384	485	567	670
Burglary	0	0	4	12	31	57	73	91	107	115	121
SMV	0	0	1	7	19	42	62	80	92	98	105
Stealing	0	0	6	27	78	151	218	263	326	376	433
Other property	0	0	1	6	22	42	71	109	164	219	285
Drug	0	0	1	2	16	30	52	81	106	136	166
Drink	0	0	0	0	0	3	13	36	111	218	342
Traffic	0	0	0	3	8	21	37	59	124	184	290
Disorder	0	2	2	20	55	112	166	220	278	332	376
Breach	0	0	0	3	8	19	28	42	57	72	82
Other	1	1	2	4	13	28	47	67	98	119	151
Any	2	4	16	58	194	341	500	649	893	1163	1450
Any (excl. breaches)	2	4	16	58	194	341	499	647	890	1159	1446
1994											
	10	11	12	13	14	15	16	17	18	19	20
Violent	0	1	6	21	63	105	154	200	244	271	304
Assault	0	0	2	8	30	50	83	104	132	151	171
Sex	0	0	0	0	0	0	0	0	0	2	2
Robbery	0	0	0	2	3	11	18	22	22	23	24
Other violent	0	1	4	17	48	80	109	146	172	196	218
Property	1	3	16	41	92	144	190	228	246	273	289
Burglary	0	0	2	6	14	23	32	40	41	46	48
SMV	0	0	1	3	11	19	25	33	36	40	46
Stealing	1	3	15	32	72	118	158	184	193	205	213
Other property	0	0	0	3	13	23	37	55	68	92	105
Drug	0	0	1	3	5	8	18	29	48	85	130
Drink	0	0	0	0	0	0	1	15	74	144	202
Traffic	0	0	0	1	5	15	30	73	133	197	280
Disorder	0	0	5	22	54	83	127	159	186	220	240
Breach	0	0	0	1	16	29	48	69	85	116	138
Other	0	0	1	5	20	30	47	60	77	100	121

Any	1	4	25	68	138	219	304	400	536	689	830
Any (excl. breaches)	1	4	25	68	136	215	301	394	533	685	826

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table A2.4: Cumulative prevalence of offending by offence type and age (Indigenous offenders, 1984 and 1994)

1984											
	10	11	12	13	14	15	16	17	18	19	20
Violent	3	7	23	54	131	224	293	370	470	534	600
Assault	0	1	4	12	42	80	121	166	238	283	332
Sex	1	1	3	4	5	11	11	12	17	20	21
Robbery	2	2	3	7	20	42	54	76	89	96	106
Other violent	2	5	15	42	97	158	208	266	345	404	458
Property	4	14	49	118	223	349	445	525	591	643	692
Burglary	2	4	21	59	121	188	232	272	308	328	343
SMV	0	2	9	33	71	116	171	215	239	256	268
Stealing	3	11	35	75	150	235	299	359	417	456	489
Other property	0	3	5	19	52	94	140	192	226	269	306
Drug	0	3	5	11	36	67	96	141	183	229	264
Drink	0	0	0	1	1	9	17	40	90	149	181
Traffic	1	1	3	12	32	61	111	158	230	303	387
Disorder	3	13	28	82	161	261	326	413	532	615	667
Breach	0	2	5	11	32	58	83	117	167	211	244
Other	0	1	4	18	44	85	110	154	223	268	308
Any	7	22	70	165	324	507	635	745	870	969	1024
Any (excl. breaches)	7	22	69	165	324	506	635	745	870	969	1024
1994											
	10	11	12	13	14	15	16	17	18	19	20
Violent	1	11	32	75	155	231	296	353	402	444	477
Assault	0	4	11	24	54	92	136	181	225	258	285
Sex	0	0	1	1	2	3	4	6	9	9	9
Robbery	0	1	1	11	19	40	57	70	78	86	88
Other violent	1	6	22	60	124	177	225	270	310	345	369
Property	10	45	79	130	228	310	382	430	447	462	472
Burglary	5	21	42	65	119	155	201	226	242	252	259
SMV	1	7	17	35	64	88	110	136	151	159	166
Stealing	4	29	56	97	168	231	283	320	342	359	368
Other property	1	6	14	30	63	87	116	150	173	193	213
Drug	0	0	3	9	13	33	56	88	117	157	192
Drink	0	0	0	0	1	2	5	25	45	65	89
Traffic	0	2	6	14	29	56	89	148	204	256	296
Disorder	10	34	67	113	196	268	342	402	437	468	489
Breach	0	2	7	23	69	118	160	220	255	294	331
Other	1	1	7	18	48	73	106	146	184	219	259

Any	16	56	108	184	319	426	502	564	608	632	654
Any (excl. breaches)	16	56	108	184	317	423	500	563	608	632	653

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]

Table A3: Annual number of unique offences by offence type and age (1984 and 1994)

1984											
	10	11	12	13	14	15	16	17	18	19	20
Violent	9	48	41	133	283	473	567	857	998	897	770
Assault	0	3	11	23	61	109	164	243	336	317	282
Sex	1	35	5	13	12	21	16	10	18	15	10
Robbery	3	0	1	10	34	96	66	155	129	55	36
Other violent	5	10	24	87	176	247	321	449	515	510	442
Property	31	54	193	477	1092	1503	1737	1916	1816	1611	1263
Burglary	7	18	63	155	366	438	406	453	359	287	196
SMV	0	5	24	60	151	277	366	353	247	148	81
Stealing	24	27	87	192	459	622	698	690	633	544	370
Other property	0	4	19	70	116	166	267	420	577	632	616
Drug	0	5	4	28	107	162	206	346	421	487	473
Drink	0	0	0	1	1	12	40	203	551	827	753
Traffic	1	1	10	32	103	226	438	740	1325	1334	1772
Disorder	7	25	77	295	390	659	783	1111	1311	1195	964
Breach	0	3	12	41	47	83	110	150	298	316	266
Other	1	2	10	30	72	105	114	200	277	285	315
Any	49	138	348	1054	2270	3385	4126	5619	7066	6965	6576
Any (excl. breaches)	49	135	336	1013	2223	3302	4016	5469	6768	6649	6310
1994											
	10	11	12	13	14	15	16	17	18	19	20
Violent	4	41	96	178	355	464	553	583	688	654	595
Assault	0	7	12	32	92	123	194	182	239	224	173
Sex	0	0	1	2	7	7	7	25	11	7	4
Robbery	0	1	0	22	55	57	62	56	46	39	12
Other violent	4	33	83	122	201	277	290	320	392	384	406
Property	26	119	215	473	674	830	900	867	739	697	477
Burglary	12	39	84	154	192	260	261	222	175	117	61
SMV	1	11	30	58	78	126	118	88	83	65	28
Stealing	12	60	89	222	330	363	406	372	271	223	163
Other property	1	9	12	39	74	81	115	185	210	292	225

Drug	0	2	7	13	20	62	125	189	340	547	564
Drink	0	0	0	0	1	6	31	105	313	382	389
Traffic	0	5	11	37	86	217	336	532	880	940	940
Disorder	27	67	188	222	535	694	773	756	725	684	575
Breach	0	5	16	87	211	363	500	657	726	692	591
Other	2	3	21	29	68	97	128	192	236	249	218
Any	59	242	555	1039	1950	2736	3346	3881	4647	4845	4349
Any (excl. breaches)	59	237	539	952	1739	2373	2846	3224	3921	4153	3758

Source: Payne et al. (2016) – Trajectories of two NSW Birth Cohorts [Computer File]