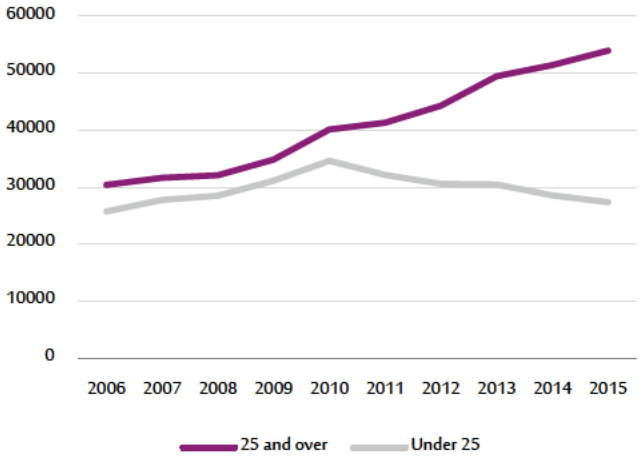
Number 1, March 2016

Paul Sutherland & Melanie Millsteed

Downward trend in the number of young offenders, 2006 to 2015

The Crime Statistics Agency's (CSA's) statistical release for the year ending June 2015 identified that the annual number of unique alleged offenders aged under 25 has been decreasing over the past five years, alongside a corresponding increase in the number of offenders aged 25 and older. Figure 1 illustrates that these divergent trends are only apparent over the past five years.

Figure 1: Annual number of unique offenders aged under 25 and 25 or older, 2006 to 2015



To further examine the apparent decrease in young offenders in particular, the CSA conducted analyses to identify age-specific trends in the number of all alleged offenders, offending incidents and offences over the past ten years (from July 2005 to June 2015). The analyses compared two groups of offenders: (1) those individuals who were recorded by police for at least one offence in the period from 2006 to 2010 and (2) those recorded for at least one offence in the period from 2011 to 2015. Offenders in each of these periods were categorised into five year age cohorts, based on their year of birth. This enabled comparison of unique five-year age cohorts of people across the two five-year time periods. For example those born between 1992 and 1996 (aged 10 to 14 in 2006) are a completely separate group of offenders compared to those born between 1997 and 2001 (aged 10 to 14 in 2011). For the purpose of this paper, 'cohort 1' will be used to describe age groupings in 2006 and 'cohort 2' will be used to describe age groupings in 2011.

The number of unique offenders aged 10 to 14 decreased by 37% from 2006-10 to 2011-15.

Between 2011 and 2015, cohort 2 included 17,830 unique 10 to 14 year old offenders. This is 37.4% lower than the number of unique 10 to 14 year old offenders that comprised cohort 1 between 2006 and 2010. Though not described in detail here, the number of unique offenders across all other age cohorts increased over the ten year period, with the exception of those aged 15 to 19. The size of this group remained relatively stable, comprising 44,949 unique offenders between 2006 and 2010 and 44,607 between 2011 and 2015.

Table 1: 2006-10 to 2011-15 comparison of age-specific unique offenders, offences and average number of offences per unique offender[1]

	Age category in 2006	10-14	15-19	20-24
	Years of birth	1992-96	1987-91	1982-86
Time period 1: 2006-2010	Unique offenders (*n*)	28,494	44,949	33,558
	Incidents (*n*)	73,499	117,937	81,645
	Incidents per offender (*m*)	1.8	1.7	1.6
	Offences (*n*)	109,676	196,518	156,792
	Offences per offender (*m*)	3.8	4.4	4.7
	Age category in 2011	**10-14**	**15-19**	**20-24**
	Years of birth	1997-2001	1992-96	1987-91
Time period 2: 2011-2015	Unique offenders (*n*)	17,830	44,607	45,035
	Incidents (*n*)	59,082	132,981	119,000
	Incidents per offender (*m*)	2.2	1 9	1.7
	Offences (*n*)	96,337	221,623	216,129
	Offences per offender (*m*)	5.4	5.0	4 8
Percentage change (%)	Unique offenders	-37.4	-0.8	34.2
	Incidents	-19.6	12 8	45.8
	Incidents per offender	22.9	10.4	6.6
	Offences	-12.2	12 8	40.4
	Offences per offender	40.4	13.6	2.7

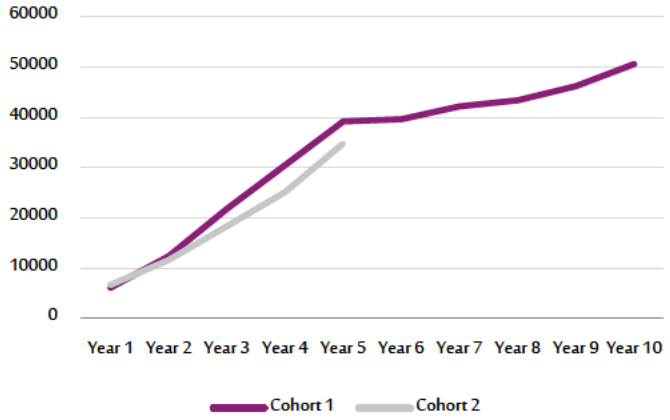
The average number of offences and offending incidents per offender increased for 10 to 14 year olds from 2006-10 to 2011-15

Despite the decrease in the number of young offenders over the past ten years, the average number of offending incidents and offences recorded per unique offender increased for those aged 10 to 14 from 2006-10 to 2011-15. There was a 22.9% increase in the average number of offending incidents per unique offender across these cohorts, and a 40.4% increase in the average number of offences recorded per unique offender.

The total number of offences recorded for 10 to 14 year olds in 2011-15 was lower than the total number of offences recorded for 10 to 14 year olds in 2006-10.

Figures 2 and 3 illustrate the number of offences and offending incidents over the first five years of offending for cohort 1 compared to cohort 2 of 10 to 14 year olds. Figure 2 shows that the number of offences recorded for both groups follows a similar pattern over their first five years of offending, and that only slightly fewer offences were recorded each year for cohort 2, despite the fact that this cohort comprised 37.4% fewer individuals.

Figure 2: Number of offences recorded for 10-14 year olds



In their fifth year of offending, the latter cohort of 10-14 year olds had 23% less offending incidents recorded than the earlier cohort of 10-14 year olds.

Figure 3 shows that there is a greater difference between the number of offending incidents for cohorts 1 and 2 of 10 to 14 year olds. At the peak of their offending to date (the fifth offending year), those in cohort 1 had 25,697 incidents recorded, while those in cohort 2 had 22.9% less incidents recorded (19,800).

Over half of all 10 to 14 year olds continue to be recorded for only a single offence over their first five years of offending.

Figure 4, however, shows over half of the young people in both cohorts 1 and 2 had only a single offence recorded against them, with a slightly higher proportion of offenders in cohort 2 committing five or more offences over their first five years of offending.

Figure 3: Number of incidents recorded for 10-14 year olds

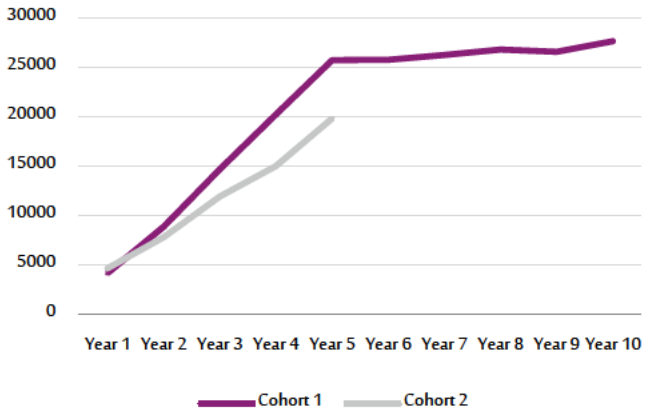
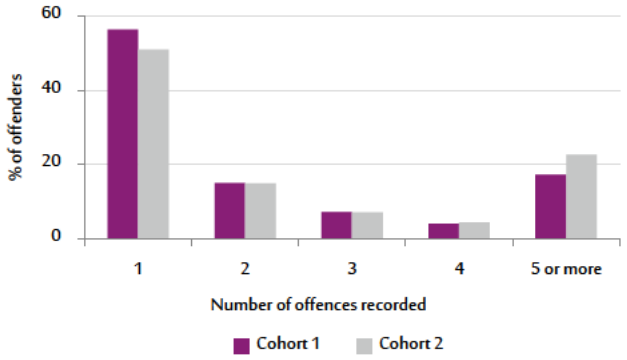


Figure 4: Number of offences recorded per 10-14 year old offender over first five years of offending



The identified drop in the number of young people offending is not unique to Victoria, with reports of similar declines in New South Wales[2] and internationally in the United States[3] and the United Kingdom[4]. Further research is required to determine whether there are demographic or offence type differences between the two cohorts of young people, and the impact of policing practices on the number of young offenders and their rate of offending.

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[1] The same cohort of offenders (by year of birth) is indicated by the same column colour across the two time periods.

[2] Weatherburn, D., Freeman, K. & Holmes, J. (2014). Young but not so restless: Trends in the age-specific rate of offending. Sydney: NSW Bureau of Crime Statistics and Research.

[3] Farrell, G., Laycock, G. & Tilley, N. (2015). Debuts and legacies: the crime drop and the role of adolescence-limited and persistent offending. Crime Science, 4(16).

[4] Bateman, T. (2014). Where has all the youth crime gone? Youth justice in an age of austerity. Child and Society, 28(5).

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CRIME STATISTICS AGENCY

Number 3, July 2016

Melanie Millsteed & Paul Sutherland

How has youth crime in Victoria changed over the past 10 years?

A previous Crime Statistics Agency (CSA) paper revealed that the number of very young offenders aged 10 to 14 has decreased over the past ten years, the number aged 15 to 19 has remained stable and the number aged 20 to 24 has increased (Sutherland and Millsteed, 2016). That paper also found that on average, the number of incidents per offender increased for all of these groups. However, questions remain about how much crime youth account for overall, how many individuals are offending at a high rate, and whether there have been changes in the type of offences recorded for young people. This paper examines the police-recorded offending of three groups of young offenders over three two-year time periods (2007-2008, 2011-2012 and 2015-2016). The numbers of unique individuals who made up these groups are shown in Table 1, with their age category based on how old they were at the beginning of each time period.

Table 1: Number of unique offenders and age adjusted offender rates

Years	Age Group 10-14	15-19	20-24
2007-2008 (April 2006-March 2008)			
Number of unique offenders	11,508	20,203	13,841
Number of incidents	23,565	42,990	27,542
2011-2012 (April 2010-March 2012)			
Number of unique offenders	9,178	23,583	21 375
Number of incidents	20,928	52,499	39,775
2015-2016 (April 2014-March 2016)			
Number of unique offenders	6,092	17,773	20,870
Number of incidents	18,347	46,022	48,401

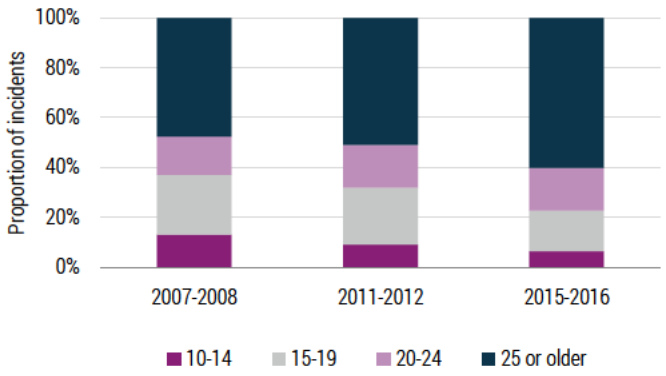
1. Has the amount of recorded crime allegedly committed by young people increased over time?

The proportion of incidents committed by offenders under the age of 25 has fallen from half of all recorded incidents in 2007-2008 to 40% of all incidents in 2015-2016.

Figure 1 shows that offenders aged 24 or younger are now responsible for a smaller proportion of all crime compared with the previous periods examined, though this may in part be due to an increase in offending by older age groups.

During the 2007-2008 period, offenders aged 24 or under were responsible for 52% of all incidents, but by the 2015-2016 period this had decreased to 40% of all incidents. The decline was most notable for 10 to 14 year olds and 15 to 19 year olds, with the proportion of offences accounted for by these groups decreasing from 13% to 6% and from 24% to 16% respectively. Over the same period, there was a corresponding increase in the proportion of offences by those aged 25 or older, from 48% to 60%.

Figure 1: Proportion of incidents recorded by offender age group



2. Has the frequency of offending increased amongst young offenders?

The proportion of young offenders recorded with higher numbers of incidents has increased slightly over time.

While the overall proportion of offending accounted for by young offenders has dropped, Figure 2 shows that the proportion of young offenders recorded for multiple incidents has increased. During 2007-2008, 17% of all alleged offenders under the age of 25 had three or more incidents recorded and this increased to 22% of all offenders during 2015-2016.

Figure 2: Proportion of offenders aged 10 to 24 recorded for 1, 2, 3 to 5, 6 to 10 and 11 or more incidents

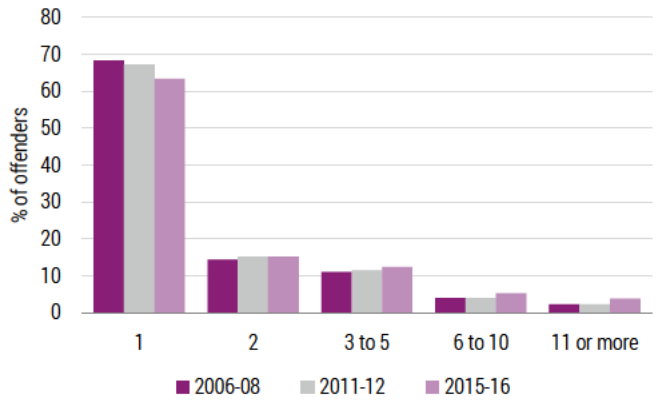


Table 2 shows the proportion and number of young offenders who were recorded for 1, 2, 3 to 5, 6 to 10 or 11 or more incidents over the past two years, along with the proportion and number of incidents each group accounted for. As shown, the 3.8% of high-frequency young offenders who were recorded for 11 or more incidents accounted for 28.9% of all incidents.

Table 2: Offending frequency, number of unique offenders aged 10 to 24 and number of incidents, 2015-2016

Number of incidents recorded per unique offender	Unique offenders		Incidents	
	%	n	%	n
1 incident	63.3	28,316	25.1	28,316
2 incidents	15.2	6,794	12.0	13,588
3 to 5 incidents	12.4	5,560	18.2	20,476
6 to 10 incidents	5.3	2,380	15.8	17,798
11 or more incidents	3.8	1,685	28.9	32,592
Total	**100.0**	**44,735**	**100.0**	**112,770**

3. Have the types of offences recorded for young people changed over time?

The proportions of young alleged offenders recorded for offences against the person, drug offences and justice procedures offences have increased, while the proportions for property and deception offences and other offences have decreased.

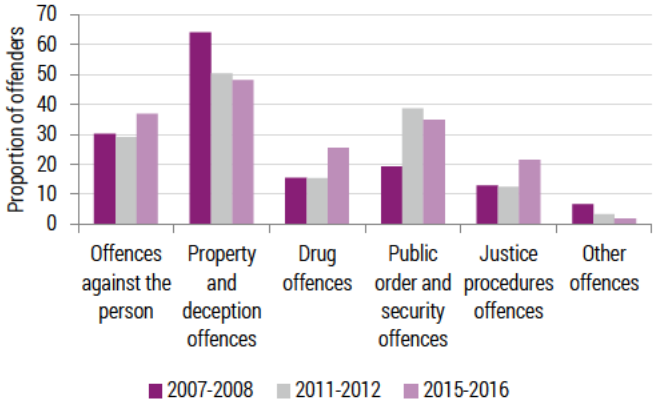
Figure 3 shows that at the offence division level, the proportion of young people recorded for at least one property and deception offence was significantly lower in 2015-2016 compared with the earlier time periods. It fell from 64.1% in 2007-2008 to 48.1% in 2015-2016. Over the same period, the proportion of offenders recorded for one or more:

- offences against the person increased significantly from 30.3 to 36.9%
- drug offences increased significantly from 15.5% to 25.5%
- justice procedures offences increased significantly from 12.9% to 21.4%.

Though the number of young offenders recorded for one or more public order offences increased significantly from 19.4% to 38.7% between 2007-2008 and 2011-2012, it has since fallen slightly to 34.8% during the most recent two year period.

The supplementary table that accompanies this report provides more detailed offence type information for young people across the three time periods.

Figure 3: Proportion of offenders aged 10 to 24 recorded for one or more of each crime type



The table shows that the fall in the proportion of offenders who were recorded for at least one property and deception offence was mostly driven by a significant decrease in those recorded for theft. Whereas in 2007-2008 43.6% of all young offenders were recorded for at least one theft offence, by 2015-2016 this had dropped to 31.0%. Across the same time periods, there was also a significant decrease in the proportion of young offenders recorded for burglary/break and enter offences, from 13.1% in to 9.4%. There were not universal decreases across the property and deception offence division over time, however, with criminal damage offences accounting for 19.6% in 2007-2008, decreasing to 16.8% in 2011-2012, and increasing again to 19.4% in 2015-2016.

A significant increase in assault and related offences from 22.4% in 2007-2008 to 27.8% in 2015-2016 contributed to the overall increase in crimes against the person depicted in Figure 3. Drug use and possession offences similarly increased from 13.8% to 23.2% over the same period. Much of the increase in justice procedures offences was due to a significant increase in breaches of orders from 8.6% in 2011-2012 to 17.4% in 2015-2016.

The CSA is currently conducting further research in this area. This includes work to determine the characteristics and offending trajectories of the high-frequency young offenders identified in this paper and examine the seriousness of youth offending and how this may have changed over time.

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Supplementary table – offences by subdivision and cohort

Offence subdivision	10-14 year olds			15-19 year olds			20-24 year olds		
	2007-2008	2011-2012	2015-2016	2007-2008	2011-2012	2015-2016	2007-2008	2011-2012	2015-2016
A10 Homicide and related offences	0	4	0	42	31	39	90	59	69
A20 Assault and related offences	1,745	2,300	2,497	9,300	9,866	9,054	7,683	8,661	10,534
A30 Sexual offences	375	520	449	1,426	1,387	1,464	1,048	1,224	1,638
A40 Abduction and related offences	9	12	16	92	158	143	114	251	283
A50 Robbery	504	506	370	2,175	2,885	1,981	760	958	684
A60 Blackmail and extortion	1	2	0	11	28	42	43	53	45
A70 Stalking, harassment and threatening behaviour	134	187	333	965	1,375	1,578	1,225	1,629	2,444
A80 Dangerous and negligent acts endangering people	375	323	395	1,275	1,466	1,417	1,052	1,312	1,749
B10 Arson	405	369	356	668	595	860	240	241	398
B20 Property damage	3,522	3,082	2,960	10,799	10,438	8,289	4,949	5,057	6,169
B30 Burglary/Break and enter	2,711	2,114	1,532	6,925	5,982	4,369	3,569	3,180	3,303
B40 Theft	8,335	7,358	5,292	25,050	23,757	21,138	16,028	14,695	17,116
B50 Deception	173	185	622	4,283	2,961	4,656	7,324	6,449	8,425
B60 Bribery	0	0	0	0	3	0	4	7	1
C10 Drug dealing and trafficking	9	18	15	514	459	804	1,428	1,306	2,381
C20 Cultivate or manufacture drugs	2	0	2	75	101	116	237	343	479
C30 Drug use and possession	165	194	233	2,845	3,639	4,898	5,058	5,815	9,656
C90 Other drug offences	0	0	0	1	0	0	0	1	4
D10 Weapons and explosives offences	401	379	340	2,445	2,488	2,691	2,368	2,918	5,392
D20 Disorderly and offensive conduct	345	438	368	2,816	8,035	4,564	2,214	12,328	8,157
D30 Public nuisance offences	562	458	454	1,386	1,431	1,135	543	513	786
D40 Public security offences	0	2	9	4	4	4	30	14	23
E10 Justice procedures	128	159	240	1,424	1,590	1,891	1,568	1,753	2,763
E20 Breaches of orders	179	262	1,764	2,316	2,696	8,730	4,116	5,062	13,027
F10 Regulatory driving offences	13	1	0	43	7	3	5	4	12
F20 Transport regulation offences	171	110	44	553	307	187	50	62	144
F30 Other government regulatory offences	197	124	28	1,678	1,036	176	185	164	127
F90 Miscellaneous offences	24	35	15	84	109	77	122	88	90

Number 4, July 2016

Paul Sutherland & Melanie Millsteed

What outcomes do police record for young alleged offenders in Victoria?

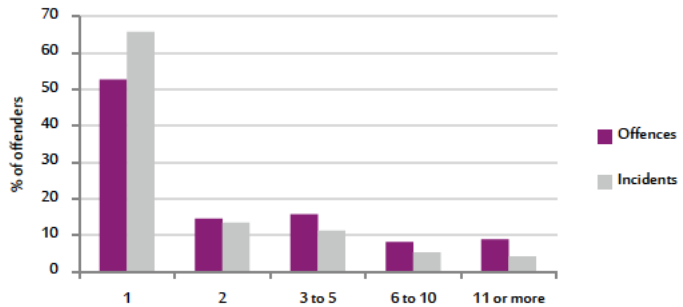
Recent Crime Statistics Agency (CSA) analysis has revealed that the number of young offenders in Victoria has decreased over the past ten years but that the number of offences recorded by police for this group has increased slightly (Millsteed and Sutherland, 2016). The number of offences recorded by police is the number alleged to have been committed, and is not necessarily indicative of the number of offences for which these young people are eventually proven guilty. Though the CSA does not hold data on court outcomes, data is available on the action taken by police in response to the alleged offence, for example whether an offender was cautioned, arrested or issued with a summons.

The purpose of this paper is to consider the extent to which offences alleged to have been committed by young people progress from being recorded by police to a more formal legal action, and potential progression through the criminal justice system. The analysis presented here is based on offences recorded between 1 April 2015 and 30 March 2016, alleged to have been committed by people aged 10 to 17 as at 1 April 2015. This sample included 7,998 alleged offenders. In total over the past year, this group were recorded for 20,134 separate incidents involving 32,191 alleged offences.

The majority of 10 to 17 year old alleged offenders were only recorded for a single incident over the past year.

Figure 1 shows the number of offences and incidents recorded for per unique offender over the past year. The majority (66%, n=5,264) of alleged offenders only had one incident recorded. Because multiple offences can be recorded per incident, a larger proportion had one incident recorded compared to those who had one offence recorded.

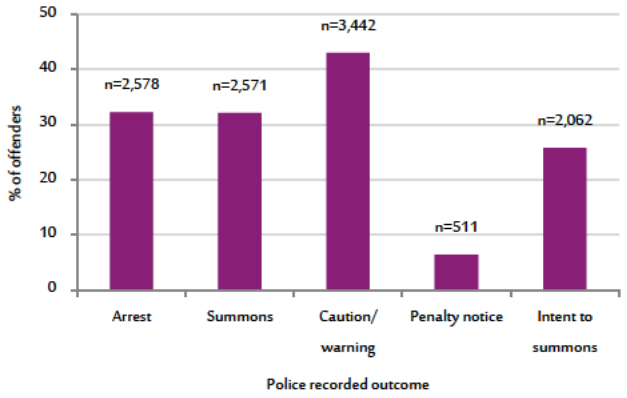
Figure 1: Proportion of offenders aged 10 to 17 recorded for 1, 2, 3 to 5, 6 to 10 and 11 or more offences and incidents



Over a third of young alleged offenders were only recorded for a caution or warning for their recorded offence(s).

Overall, 35% (n=2,773) of the young offenders analysed received only a caution or warning for their recorded offence(s) over the past year. A further 3% (n=208) received only a penalty notice and an additional 19 offenders received only penalty notice(s) and caution/warning(s). As shown in Figure 2, a total of 32% (n=2,578) of the offenders received at least one arrest, 32% (n=2,571) received at least one summons, and for 26% (n=2,062) police recorded that they intended to summons the offender at some point in the future.

Figure 2: Proportion of offenders who recorded for at least one of each police outcome



*** Note that this figure excludes 'other' outcomes recorded and CSA data holdings do not cover all penalty notices issued in Victoria.**

Alleged offenders with a high frequency of offending over the past year were more likely to receive at least one arrest, summons, or intent to summons than those with a low frequency of offending, who were more likely to receive a caution or warning.

Table 1 shows the outcomes recorded for people according to how many offences they were alleged to have committed over the past year. People recorded for more than one offence over the period are counted once for each outcome type they had recorded. As shown, the more offences someone is recorded for, the more likely they are to have at least one arrest, summons or intent to summons recorded. Almost all of those (97%) recorded for 11 or more offences had at least one arrest recorded. The opposite is the case for cautions or warnings, with the likelihood of having a caution or warning recorded decreasing as the number of offences per offender increases.

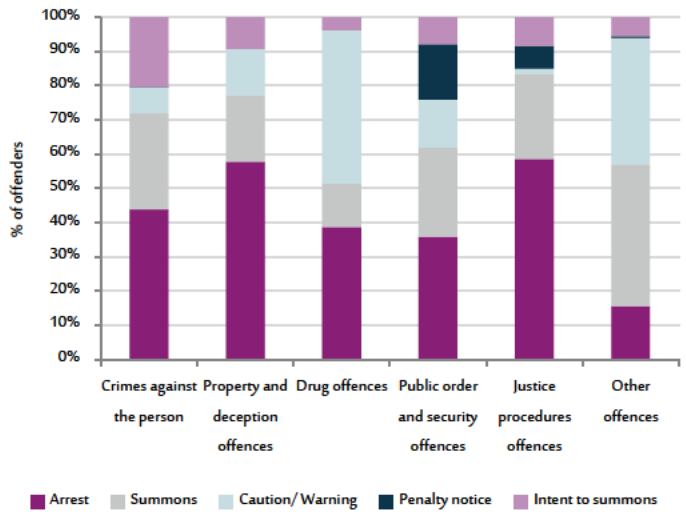
Table 1: Proportion of offenders recorded for at least one of each police outcome by number of offences recorded per offender

Number of offences per offender		Police recorded outcome				
		Arrest	Summons	Caution/ Warning	Penalty notice	Intent to Summons
1 offence	%	9.4	13.1	58.0	4.4	15.1
	n	395	552	2,443	187	638
2 offences	%	27.6	34.5	36.0	4.6	25.3
	n	321	401	418	53	294
3 to 5 offences	%	52.2	50.0	26.0	6.8	31.9
	n	658	630	328	85	402
6 to 10 offences	%	79.2	67.7	20.5	7.8	45.0
	n	517	442	134	51	294
11 or more offences	%	97.0	77.1	16.8	19.1	61.3
	n	687	546	119	135	434

The majority of property and deception and justice procedures offences recorded for youth offenders are dealt with by way of an arrest.

Figure 3 shows the police outcomes recorded across each of the high-level offence categories used by the CSA. As shown, property and deception offences and justice procedures offences are associated with a higher proportion of arrests, with 58% of offences in both categories being dealt with by way of an arrest. On the other hand, drug offences are most likely to result in a caution or warning being recorded (45%), though this is perhaps expected given that Victoria Police's Drug Diversion Program provides a specific cautioning option for drug use and possession offences. Similarly, public order and security offences are associated with a greater likelihood of receiving a penalty notice (16%).

Figure 3: Offence type by police-recorded outcome



The police recorded outcomes associated with a selection of more detailed offence categories are outlined in Table 2.

Table 2: Offence type by outcome recorded

Offence type		Police recorded outcome				
		Arrest	Summons	Caution/ Warning	Penalty notice	Intent to Summons
Assault & related	%	33 9	34.4	9.0	0.1	22.6
	n	1,387	1,410	368	4	926
Sexual offences	%	12.1	22 8	14.4	0.0	50.6
	n	58	109	69	0	242
Robbery	%	82.1	7.4	0.4	0.4	9 8
	n	931	84	4	4	111
Stalking & harassment	%	46 3	30.5	7.8	0.0	15.4
	n	292	192	49	0	97
Dangerous acts	%	58.1	27.1	6.6	0.0	8 2
	n	369	172	42	0	52
Arson	%	54 9	19.4	15.7	0.0	10 0
	n	224	79	64	0	41
Property damage	%	38.4	32 2	14.0	0.0	15.4
	n	1,613	1,350	587	0	647
Burglary	%	70 0	9.5	10.9	0.0	9.6
	n	1,603	218	250	0	219
Theft	%	61 3	15 9	15.5	0.0	7 3
	n	5,752	1,492	1,458	0	682
Deception	%	72 3	20.1	3.7	0.0	3 9
	n	1,051	292	54	0	56
Drug use & possession	%	34.6	12 8	49.2	0.0	3.4
	n	422	156	600	0	42
Weapons & explosives	%	41 8	25 2	14.5	10.9	7.6
	n	383	231	133	100	70
Offensive behaviour	%	35 0	23.5	4.2	28.7	8.7
	n	424	285	51	348	105
Public nuisance	%	29 3	32 0	32.0	0.0	6.7
	n	187	204	204	0	43
Justice procedures	%	51 8	28.5	6.3	3.2	10 3
	n	322	177	39	20	64
Breaches of orders	%	60 2	24 0	0.5	7.5	7 9
	n	1,445	575	11	179	189

Police recorded outcomes provide some measure of the seriousness of offending, and of the extent to which offences recorded by police proceed to formal legal proceedings. The brief analysis presented here showed that over two-thirds of alleged offenders aged 10 to 17 were recorded for just one incident over the past 12 months. Further, just over one-third received a caution/warning for their offence(s) during this period. Future CSA analyses will explore the characteristics of young offenders who offend at a high level of frequency and/or seriousness.

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Patterns of recorded offending behaviour amongst young Victorian offenders

Paul Sutherland and Melanie Millsteed

Previous research has identified that groups of young offenders follow diverse offending trajectories over their early offending careers. This paper uses a statistical technique, the semi-parametric group-based method, to identify the latent offending trajectories of a cohort of Victorian offenders born over a two year period between April 1996 and March 1998, across the first eight years of their offending as recorded by Victoria Police. The analysis identified four trajectory groups: 'low', 'adolescent limited', 'late developing' and 'high', with the vast majority of offenders falling into the low group. Risk factors for inclusion in one of the three higher rate trajectory groups included being male, identifying as Aboriginal or Torres Strait Islander, and living in one of the most socio-economically disadvantaged areas at the commencement of their offending record. Additional research is required to identify whether there are particular life events or characteristics that trigger escalation or desistance from offending across the groups identified.

Keywords: trajectories, life-course criminology, youth offending, offender characteristics, crime types

Introduction

The 'age-crime curve', whereby criminal behaviour commences in late childhood or early adolescence, increases throughout adolescence and peaks in late adolescence or early adulthood, before declining, is a well-established phenomenon in criminology (Sweeten, Piquero & Steinberg, 2013). Early theorists hypothesised that the age-crime curve is invariable, that is, that it is universal and does not differ across individuals or groups of individuals (Hirschi & Gottfredson, 1983, Farrington, 1986). At an aggregate, population level at least, there is significant empirical evidence to suggest that the age crime-curve exists (Jennings and Reingle, 2012).

However, others have suggested that in fact, distinct groups of offenders can be identified based on the different patterns of offending over the course of their lives (Moffitt, 1993; Patterson, 1993; Piquero, 2008). Moffitt's (1993) enduring developmental taxonomy, for example, posits two groups of offenders who have different trajectories, characteristics and developmental histories. The 'life-course persistent' group consists of a very small number of offenders whose neuro-psychological issues interact with ineffective parenting and other adversities. This in turn contributes to their early commencement of and persistent participation in, all kinds of criminal and violent behaviour (Moffitt, 1993; Piquero, 2008). On the other hand, the 'adolescent limited' group consists of a larger group of individuals, whose offending is largely considered to be a result of a maturity-gap, which encourages them to imitate anti-social behaviour during adolescence. The majority of these adolescent limited offenders are not hypothesised to have experienced adverse childhoods. This group is thought to desist from crime by the time they reach adulthood as part of a typical maturation process (Moffitt, 1993; Piquero, 2008).

With the advent of new statistical techniques, researchers have been able to show that sub-populations of offenders do indeed follow markedly different offending trajectories. Using offending data from either administrative or self-report longitudinal sources, the semi-parametric group-based method (SPGM)[1] has been used to identify the number of groups within a population that follow distinct, latent trajectories of offending frequency over the life course.

[1] First developed by Nagin and Land (1993).

A large number of studies have now been conducted using SPGM. In 2008, Piquero identified and reviewed 80 studies that had been conducted using this method to explore criminal activity over the life course, and in 2012, Jennings and Reingle identified 105 studies that had used these methods to examine trajectories of violence, aggression and delinquency. In summarising his review, Piquero (2008) noted that:

- the number and shape of trajectories found was relatively consistent across studies.
- studies identified three and five groups on average, with slightly more groups identified in studies that use self-report data rather than administrative data.
- in general, there tends to be a low-rate group, a high-rate group, a moderate but declining group, and a late onset group.
- consistent with Moffitt's (1993) developmental taxonomy, studies reveal an adolescent peaked pattern of offending and a chronic pattern of offending. Studies also routinely identified a 'late-onset chronic' group that was not accounted for by extant criminological theory.
- some studies have identified groups whose offending peaks at different ages (e.g., in early or middle adulthood instead of during adolescence), and sometimes these offending peaks differ across crime types (Sampson & Laub, 2003).

Jennings and Reingle's (2012) review confirmed these findings, noting that for the studies they assessed, models generally contained three or four groups, and that most identified groups consistent with Moffitt's (1993) taxonomy. Their review also found that where there was variation in the number of groups identified, this was often associated with the methodological aspects of the studies, including the population studied, the nature of the longitudinal data used to identify groups (i.e., self-report data versus administrative data), which developmental phase is captured by the data, length of observation and geographical context.

In addition to identifying offending trajectory groups, studies in this area have also focussed on identifying between-group differences in the characteristics and life-circumstances of group members in an attempt to identify risk factors for particular patterns of offending behaviour (Blokland & Nieuwbeerta, 2005; Ferrante, 2013; Livingston, 2008; Marshall, 2006). Focussing specifically on five Australian studies published to date which used SPGM (Allard et al., 2015; Broidy et al., 2015; Ferrante, 2013; Livingston et al., 2008; Marshall, 2006), the relationships between the offender groups and factors such as gender, age of onset of offending, Indigenous status, level of socio-economic disadvantage, residential location, and the criminal justice action taken in response to an individual's first offence have all been analysed (although not in a Victorian context).

Across these Australian-based studies, gender and Indigenous status have consistently been found to be correlated with trajectory group assignment. Specifically, male offenders and Indigenous offenders are more likely to be statistically assigned to chronic offender groups than females and non-Indigenous offenders (Broidy et al., 2015). In addition, Marshall's (2006) study using South Australian police apprehension data to examine the first ten years of offending for a 1984 birth cohort found that age of onset and the overall number and type of apprehension events differed between groups. Livingston et al. (2008) identified three trajectory groups for a 1983/84 birth cohort of offenders in Queensland, and found that socioeconomic disadvantage is related to group assignment, but remoteness of residence is not related. The relationship between group assignment and disadvantage was replicated for a 1990 Queensland cohort of offenders by Allard et al. (2015), who identified that their adult onset offenders group experienced significantly lower levels of disadvantage than all other groups. On the other hand, the early onset (chronic) group experienced the highest levels of disadvantage. Ferrante (2013) studied a large cohort of Western Australian Offenders who were born between 1977 and 1995, and developed separate group-based models for males, females, Indigenous and non-Indigenous offenders. She found that early-onset of offending was a

predictor for assignment to a higher rate offending group for both males and females, along with Indigenous status and more serious offending (evidenced through early violence and/or drug use). Interestingly, she also found that contrary to expectations, being diverted from the criminal justice system early in one's criminal career increased the likelihood of belonging to a higher frequency offending trajectory, although this was only a significant risk factor for male offenders.

The present study

To our knowledge, analysis of young offenders' early offending trajectories using SPGM has not been conducted in Victoria, and is the first step in identifying associated risk and protective factors in a local context. This is particularly pertinent because, despite recent Crime Statistics Agency (CSA) research showing that both the number of young Victorian offenders and the total volume of offences recorded for them has dropped over the past decade, there has been a slight increase in the number of young offenders recorded for high frequencies of incidents (Millsteed & Sutherland, 2016). Understanding the characteristics of offenders who follow diverse offending trajectories can, in turn, aid understanding of which groups would most benefit from interventions, at what age such interventions should be targeted, and, the nature of the interventions that may be most appropriate for different groups of offenders. In other words, as stated by Piquero (2008, p.52):

> The correlates associated with…trajectories may differ and to the extent that they do, this would potentially imply different points of intervention (while at the same time recognising that the same intervention may not be applicable to all offenders…).

The aims of this study are therefore to:

- develop a group-based trajectory model for young Victorian offenders.
- identify whether and how the known characteristics of higher frequency youth offenders differ from lower frequency youth offenders.
- determine whether there are differences in the types of offences recorded for different trajectory groups, including whether there are differences in the offences first recorded for different groups (i.e. differences in initiation offences).

Method

Data

This research draws on data about all criminal incidents recorded by Victoria Police in their Law Enforcement Assistance Program (LEAP) database for a cohort of alleged offenders born over a two year period from 1 April 1996 to 31 March 1998. This enabled analysis of the longitudinal alleged offending patterns of the cohort between the ages of ten and 17 (the first eight years of their possible criminal offending careers). The paper uses three counting units: offenders, offender incidents and offences. An offender incident can involve one or more alleged offences to which an individual has been linked as an offender. An incident represents a unit of work recorded by Victoria Police and may involve offences that occur over a period of time, but are recorded as part of a single incident by police. For the purpose of this research, in cases where offences within an incident took place over multiple dates, the earliest date was used. It should also be noted that the CSA does not receive data on court outcomes, so all references to offenders, incidents and offences refer to alleged rather than proven offenders, incidents and offences.

Statistical analysis

As already noted, this paper used SPGM to identify the latent trajectory groups of offending incident frequencies for the cohort. An intensive stepwise process was used to determine the model with the most appropriate number of trajectory groups. This included examination of diagnostic measures such as the Bayesian Information Criterion (BIC, which measures the fit of the model), the average posterior probabilities (which measures the certainty with which an individual is classified to a particular group), and the odds of correct classification (OCC, which measures the probability that an individual will be assigned to the correct group). Nagin (2005) also stresses the importance of considering both the parsimony of the number of groups and the substantive goal of the project when selecting the appropriate model. This means that the model selection process is, to some extent, intuitive as well as methodological[2].

Following identification of the correct model, both chi square analyses and Kruskall-Wallis tests were applied to examine the statistical differences between trajectory groups in terms of their demographic characteristics or offending behaviours.

Results

Based on the results of the SPGM analysis, a four group model was selected. Table 1 shows the diagnostic results for the final model. Nagin (2005) suggests that when average posterior probability is higher than 0.7 and OCC values are higher than 5, the group assignment represents a high level of accuracy. Both of these criteria were fulfilled with the four group model selected.

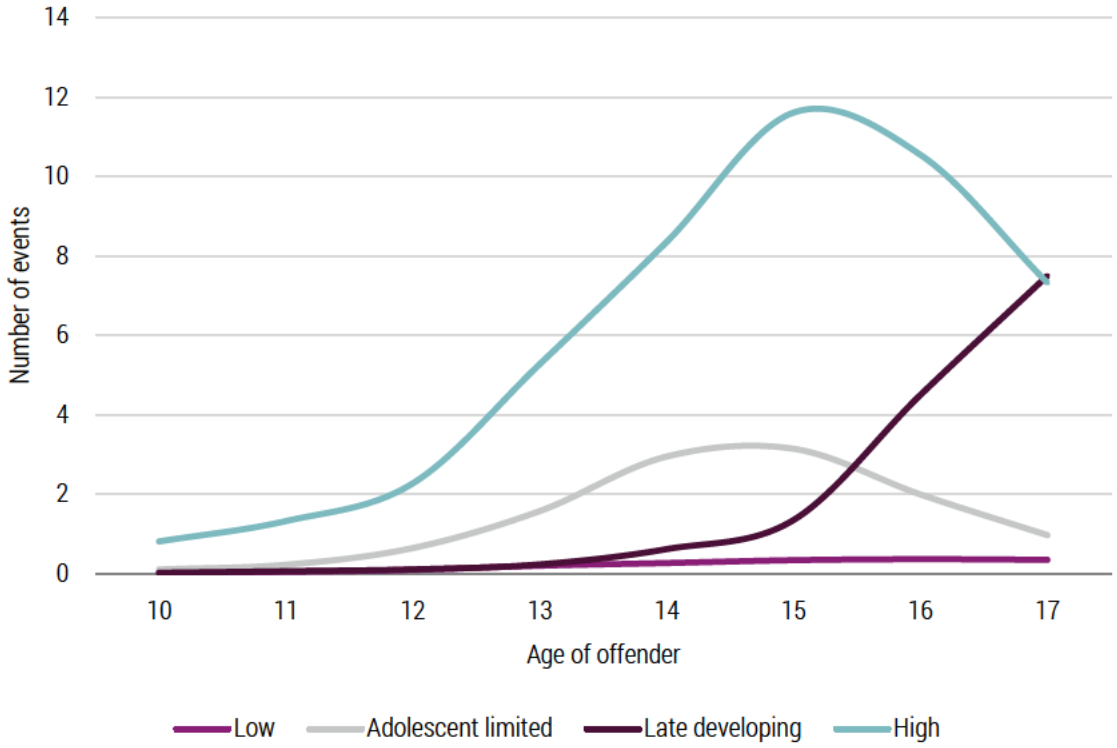
Table 1: Diagnostic statistics for the four group model

Trajectory group	Actual number of offenders	Actual percentage of total offenders	Predicted percentage of total offenders	Average posterior probability	Odds correct classification
Low	10,240	88.7%	88.5%	0.99	16.88
Adolescent limited	737	6.4%	6.5%	0.91	151.49
Late developing	388	3.4%	3.4%	0.92	327.80
High	182	1.6%	1.6%	0.98	2951.51

Overall, the model includes 11,547 unique offenders. Over their first eight years of offending this cohort were recorded for 39,680 incidents, and 58,918 offences in total. Figure 1 shows the trajectories of each of the four groups that emerged in the selected model. As shown, the modelling identified a 'high' offending group, whose offending increased rapidly from a young age. On average, this group was recorded for 0.8 incidents per individual at age 10, to a peak of 11.6 incidents at age 15, before declining to 7.3 incidents per offender at the end of the data series (age 17). The 'adolescent limited' group followed a similar offending pattern but their level of offending was much lower, peaking at an average of 3.1 incidents at the age of 15 before declining to an average of 1.0 incident per offender at age 17. The level of offending amongst the 'late developing' group remained low until around the age of 15 (where they were recorded for an average of 1.3 incidents per offender), before rapidly increasing to match the high group at age 17, with 7.5 incidents recorded on average per offender. Finally, the modelling identified a 'low' offending group who had a very low level of offending across all ages. The highest offending rate for this group, of only 0.4 incidents on average per offender, occurred at the age of 16.

[2] For more information on model type selection, see Andruff et al. (2009); Jones et al. (2001) and Nagin (2005).

Figure 1: Trajectory analysis of youth offenders, eight year cohort, from ages 10 to 17



The modelling process also results in each offender being assigned a likelihood score, which represents the percentage likelihood that they belong to each of the trajectory groups identified. The highest likelihood score assigned for each offender is used to classify their trajectory group. Table 1 shows that for the eight year model, the vast majority of offenders (88.7%, n=10,240) were assigned to the low offending group. The second largest group was the adolescent limited group, which consisted of 6.4% (n=737) of offenders, followed by the late developing group consisting of 3.4% (n=388) of offenders, and the high group, consisting of the remaining 1.6% (n=182).

Offender characteristics

Overall, 68.1% (n=7,862) of offenders in the cohort were male and 31.8% (n=3,668) were female (sex was unknown for the remaining 0.2%). Indigenous status was measured using the CSA's 'most frequent' counting rule, which classifies Indigenous status based on the most frequent status recorded by police for that offender within CSA data holdings. Using that method, 4.2% (n=485) of the cohort for this study were Aboriginal or Torres Strait Islander, 77.1% (n=8,906) were not Aboriginal or Torres Strait Islander, and status was unknown for the remaining 18.7% (n=2,156). Offender levels of socio-economic disadvantage were measured using the Australian Bureau of Statistics Index of Relative Socio-economic Disadvantage (IRSD), applied to the offenders' residential postcode at the time of their first offence within the dataset. For the purpose of this analysis, the index was broken into deciles. At the time of their first offence, 36.7% (n=4,221) of the cohort lived in the top 30% of most disadvantaged postcodes, 37.9% (4,354) in the middle 40% of postcodes and a further 25.4% (n=2,926) in the least disadvantaged 30% of postcodes.

In terms of types of initial offences recorded, the first offence recorded for 64.1% (n=7,391) of the cohort fell into the category of property and deception offences, 20% (n=2,304) were first recorded for crimes against the person, 7.6% (n=873) for public order and security offences, 4.3% (n=494) for drug offences, 2.9% (n=335) for other offences and 1.2% (n=134) for justice procedures offences. In response to 67.0% (n=7,727) of these first offences, police recorded

a caution or warning. They recorded a summons for a further 14.0% (n=1,616), an arrest for 8.8% (n=1,013), an intent to summons for 8.5% (n=981) and some other outcome for 1.7% (n=194).

Following assignment of alleged offenders to each of the four trajectory groups, the characteristics of offenders and their initial offences were compared across groups using chi-square tests to determine whether offenders from a particular group were statistically more likely to have a particular characteristic. The results of these tests are detailed in Table 2. In summary, compared to the overall cohort, the adolescent limited (74.4%, n=548), late developing (86.9%, n=337), and high (87.9%, n=160) groups contained significantly higher proportions of male offenders, and these groups also had significantly higher proportions of people who identified as Aboriginal or Torres Strait Islander (12.6%, n=93, 6.2%, n=24 and 14.8%, n=27 respectively). The adolescent limited, late developing and high groups were also more likely to include offenders whose residential postcode at the time of their first offence was in the top 30% of most socio-economically disadvantaged postcodes in Victoria.

Conversely, the low group had a higher proportion of female offenders (33.3%, n=3,406) and was less likely to include offenders who identified as Aboriginal or Torres Strait Islander (3.3%, n=341). The proportion of those whose Indigenous status was unknown was significantly higher in the low group than in the late developing group (19.8%, n=2,020 compared with 13.7%, n=53). However, this is not surprising given that the low group has, on average, had far fewer interactions with police compared with the other groups, which meant there were far fewer opportunities for this information to be recorded. Those in the low group were also more likely than those in other groups to reside in the middle 40% or least disadvantaged 30% of postcodes.

Average age at first offence was also compared across offenders using the non-parametric Kruskal-Wallis test. This analysis identified that high offenders were the youngest when they first came in contact with the police, with a median age of 12. Adolescent limited offenders had a median age of 13, while both low and late developing had a median age of 15 when they were recorded for their first incident. The Kruskal-Wallis test, found that the age in which the offender first came into contact with police significantly affected the group to which each offender was assigned[3]. Post hoc analysis (Wilcoxon two-sample tests, including a Bonferroni correction) identified significant differences between all groups, apart from between the low and late developing groups.

[3] $H(3) = 895.50$, $p<.0001$

Table 2: Characteristics of young offenders, by group

	Low		Adolescent limited		Late developing		High		Signif.
	n	%	n	%	n	%	n	%	
Sex									<.0001[4]
Male	6,817	66.6	548	74.4	337	86.9	160	87.9	
Female	3,406	33.3	189	25.6	51	13.1	22	12.1	
Indigenous status									<.0001[5]
Aboriginal or Torres Strait Islander	341	3.3	93	12.6	24	6.2	27	14.8	
Neither Aboriginal or Torres Strait Islander	7,879	76.9	575	78.0	311	80.2	141	77.5	
Unknown	2,020	19.8	69	9.4	53	13.7	14	7.7	
SEIFA index – residential address									<.0001[6]
Three most disadvantaged deciles	3,610	35.4	355	48.3	166	43.1	90	49.5	
Four middle deciles	3,918	38.4	251	34.2	124	32.2	61	33.5	
Three least disadvantaged deciles	2,671	26.2	129	17.6	95	24.7	31	17.0	
First offence									<.0001[7]
Crimes against the person	2,074	20.3	125	17.0	89	23.1	16	8.8	
Property and deception offences	6,431	62.9	550	74.9	255	66.1	155	85.6	
Drug offences	477	4.7	4	0.5	13	3.4	0	0.0	
Public order and security offences	803	7.9	41	5.6	22	5.7	7	3.9	
Justice procedures offences	121	1.2	7	1.0	5	1.3	1	0.6	
Other offences	324	3.2	7	1.0	2	0.5	2	1.1	
Outcome – first offence									<.0001[8]
Arrest	790	7.7	110	15.0	83	21.5	30	16.6	
Summons	1.377	13.5	126	17.2	79	20.5	34	18.8	
Caution/Warning	6,979	68.2	450	61.3	194	50.3	104	57.5	
Penalty notice/Other	184	1.8	4	0.5	6	1.6	0	0.0	
Intent to Summons	900	8.8	44	6.0	24	6.2	13	7.2	

Volume and nature of offending

Despite making up just 1.6% (n=182) of the offenders in the cohort, Table 3 shows that the high group accounted for 23.6% (n=13,914) of all the offences recorded across the eight year period. This equates to an average of 76.5 offences per individual offender in the high group from the time of their tenth birthday through to their last day as a 17 year old. On the other hand, while 88.7% (n=10,240) of the offenders were classified as belonging to the low trajectory group, they were responsible for just 37.5% (n=22,113, an average of 2.2 offences per offender) of all offences committed.

[4] χ^2=118.6, *p*<.0001, df=3, Cramer's V=0.10
[5] χ^2=253.3, p<.0001, df=6, Cramer's V=0.10
[6] χ^2=77.1, p<.0001, df=6, Cramer's V=0.06
[7] χ^2=114.3, p<.0001, df=15, Cramer's V=0.06
[8] χ^2=192.1, p<.0001, df=12, Cramer's V=0.07

Table 3: Number and proportion of offenders, incidents and offences by group

	Number of offenders		Number of incidents		Number of offences		Average number of offences
	n	%	n	%	n	%	
Low	10,240	88.7	16,636	41.9	22,113	37.5	2.2
Adolescent limited	737	6.4	8,671	21.9	13,688	23.2	18.6
Late developing	388	3.4	5,666	14.3	9,203	15.6	23.7
High	182	1.6	8,707	21.9	13,914	23.6	76.5

Statistically significant differences were found in the types of initiation offences across groups, which are also shown in Table 2 in the previous section. Offenders in the high group were more likely to be recorded for property and deception offences (85.6%, n=155). On the other hand, those in the low and late developing groups were more likely to be recorded from crimes against the person (20.3%, n=2,074 and 23.1%, n=89 respectively). Offenders in the low group were also more likely than other groups to have a drug offence recorded initially, though this was recorded as the first offence for only 4.7% (n=477) of the group.

Offenders in the low trajectory group were significantly less likely to be arrested in response to their first offence (7.7%, n=790), while offenders in the other three groups were all more likely to be arrested for their first offence. Additionally, offenders in the low group were more likely to be given a caution/warning (68.2%, n=6,979), a penalty notice/other outcome (1.8%, n=184) or an intent to summons (8.8%, n=900). Those in the adolescent limited (17.2%, n=126) and late developing (20.5%, n=79) groups were also more likely to be summonsed.

The total volume of offences across the broad offence types and across the trajectory groups is displayed in Table 4. There were statistically significant differences in the types of offences recorded across groups. For example, while property and deception offences accounted for the largest volume of offences for all of the groups, the high group had a significantly larger proportion of property offences (67.3%, n=9,363) than the other three groups (of which property and deception offences comprised less than 60% of total offending). The high group had a significantly lower proportion of crimes against the person recorded (17.6%, n=2,445 of their offending), compared with the low and adolescent limited groups (21.4%, n=4,735 and 23.3% n=3,188 of offending respectively). Drug offences were more likely to be recorded for the low group than for other groups, though only 5.0% (n=1,095) of this group's offending involved drug offences. The late developing group (9.2%, n=843) were significantly more likely than the low group (3.0%, n=671) to be recorded for justice procedures offences.

Table 4: Number and proportion of offences by offence division and group

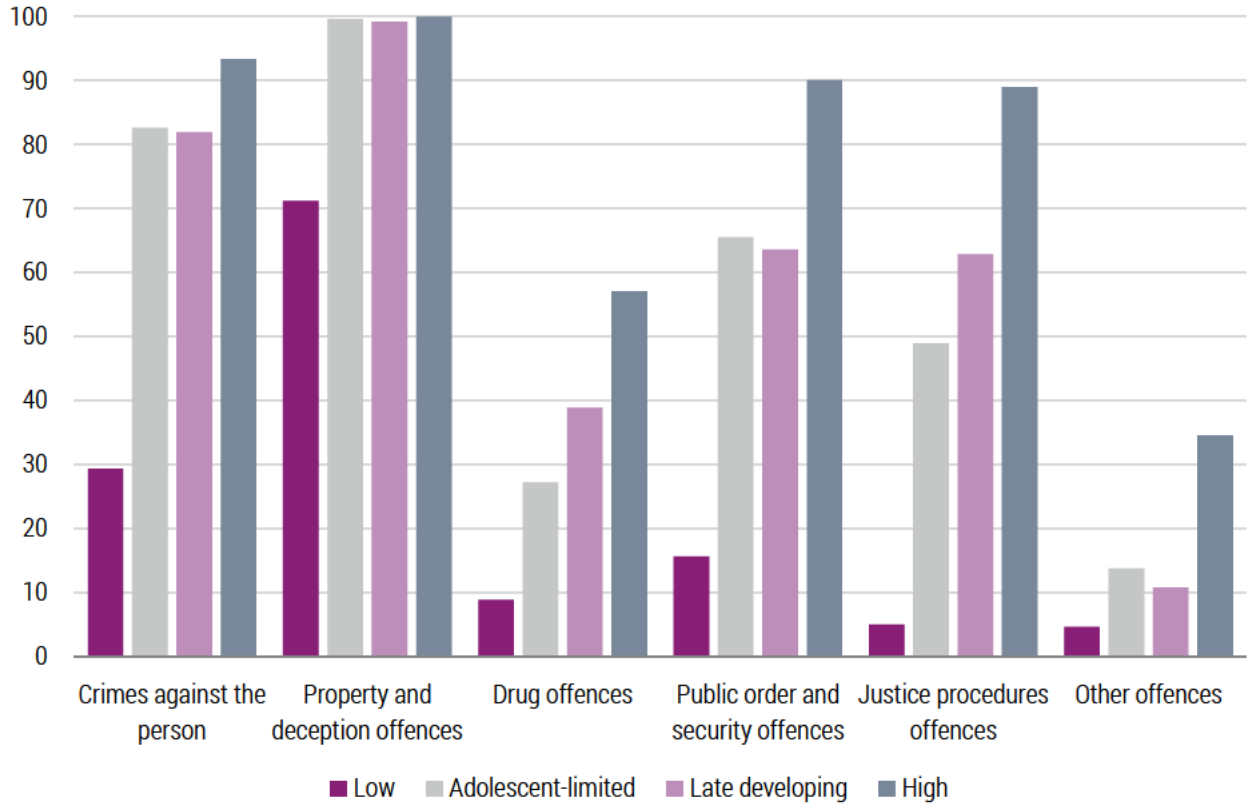
	Crimes against the person		Property and deception offences		Drug offences		Public order and security offences		Justice procedures offences		Other offences		Signif.
	n	%	n	%	n	%	n	%	n	%	n	%	
Low	4,735	21.4	13,124	59.4	1,095	5.0	1,973	8.9	671	3.0	515	2.3	<.0001[9]
Adolescent limited	3,188	23.3	8,137	59.5	326	2.4	1,102	8.1	800	5.8	135	1.0	
Late developing	1,931	21.0	5,447	59.2	267	2.9	665	7.2	843	9.2	50	0.5	
High	2,445	17.6	9,363	67.3	257	1.9	813	5.8	920	6.6	116	0.8	

[9] χ^2=1383.9, p<.0001, df=15, Cramer's V=0.09

In order to show the different types of offences recorded for members of each group over their first eight years of offending, Figure 2 shows the proportion of offenders in each group who committed at least one offence across each of the CSA's offence divisions. Although, in terms of total volume of offences, the high group had a lower proportion of crimes against the person recorded against them in total, a significantly higher proportion of high group offenders were recorded for at least one crime against the person (93.4%, n=170) between the ages of 10 and 17 than for any other trajectory group. Unsurprisingly given that this group has a high offending frequency, the range of offence types recorded for them is also broader than for other groups.

Almost all of the offenders in the adolescent limited, late developing and high offending groups were recorded for at least one property and deception offence (99.6% n=734, 99.2% n=385, and 100% n=182 respectively). More than two-thirds (71.3%, n=7,298) of those in the low group were also recorded at least one property and deception offence.

Figure 2: Proportion of offenders recorded for at least one offence, by offence subdivision and trajectory group



Discussion

Consistent with other studies that have employed SPGM to examine youth offending trajectories, the analysis presented in this paper identified that the vast majority of young Victorian offenders (88.7%) offended at a very low rate across the first eight years of their potential criminal careers. At the height of their offending over this period, this group were only recorded for an average of 0.4 incidents per year. It should be noted, however, that a key limitation of this work is that it is based on official police records of alleged offending, which likely underestimate the true extent of offending behaviour. Further, as Livingston et al. (2008) highlight, this underestimation may not be evenly distributed across crime types, geographic areas or socioeconomic groups.

Nevertheless, Jennings and Reingle (2012) comment that limited attention has been given to the policy implications of trajectory studies but that they can be used as a way to target prevention and intervention strategies towards the

most costly and concerning young offenders. In this study, two trajectory groups emerged that had much higher rates of alleged offending. The first of these, termed the high group, consisted of 1.6% of the cohort and their offending escalated rapidly from about the age of 12, peaking at around age 15 with 11.6 incidents recorded on average during that year of age. Though this group consists of less than two percent of offenders, they are, overall, responsible for 24% of offences. Proportionally, they accounted for more property offences and less crimes against the person than other trajectory groups. However, over 90% had at least one crime against the person recorded over the eight-year analysis period. Compared to other groups, the high group includes a very large proportion of offenders recorded for the most serious offences.

The second high-rate offender group identified through this analysis was the late developing group, which comprised an additional 3.4% of offenders. The patterns observed for this group saw offending escalate from the age of 15 and continue to increase until the end of the analysis period (age 17) examined in this study. This group was statistically more likely than any other group to have a crime against the person recorded as their first offence when compared with other groups. Nevertheless, some research suggests that desistance from crime can often occur in the early twenties (Piquero, Farrington & Blumstein, 2007). Future research could consider following the late-developing group further throughout their offending career to examine whether this group desists in their 20s or continues to offend at a high rate.

Recent research has also identified that, contrary to prior criminological theory, a large number of offenders first have contact with the justice system as adults (DeLisi & Piquero, 2011; Thompson et al., 2014). In Queensland, Thomson et al. (2014) identified that half of a 1983/1984 birth cohort were adult-onset offenders who first came into contact with the criminal justice system between the ages of 18 and 25. Accumulation of longitudinal data will enable future CSA research to consider the prevalence and nature of adult-onset offending in Victoria.

Similar to other Australian studies (Marshall, 2006; Livingston et al., 2008), young people who fell into all but the low trajectory group were statistically more likely to be male, to identify as Aboriginal or Torres Strait Islander, and to live in the most socio-economically disadvantaged areas at the commencement of their offending record. However, our knowledge of the characteristics of these high-rate groups remains limited. Data was not available to consider, for example, whether particular life events, educational pathways or parenting styles influenced the trajectories young offenders followed. Further, our research included only a preliminary consideration of how criminal justice interventions might impact on the course of offending behaviour by considering the broad police outcome recorded for the first offence. Additionally, it was not possible to control for variations in policing responses across individuals, geographic areas, and offence types. For example, it may be the case that once an offender becomes known to police for a particular offence type, that offender may be more likely to have their further offending behaviour detected than other offenders, which in turn could potentially impact which trajectory group they are assigned to.

Researchers have stressed a need to move away from simply identifying trajectory groups and their key characteristics, to detailed examination of the risk and protective factors for particular offending trajectories, and whether these apply differentially across groups or over time (Jennings and Reingle, 2012; Piquero, 2008). In the context of this study, for example, further research could seek to unpack what factors influence members of the adolescent limited trajectory to desist from crime towards the end of adolescence, or whether there are particular events that trigger escalation of offending amongst the late-developing cohort.

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