Predictors of recidivism amongst police recorded family violence perpetrators

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Prior research has identified that a number of factors are associated with an increased risk of recidivism amongst perpetrators of domestic violence and that the risk assessment tools currently available have limited statistical capacity to accurately predict recidivism. In Victoria, police complete a risk assessment form (the L17 form) for each family incident reported to them. This study sought to analyse the relationship between repeat family incidents, and factors that may predict such incidents including alleged perpetrator characteristics and L17 risk factors recorded by police. Logistic regression modelling identified statistical relationships between some, but not all, of the alleged perpetrator characteristics and risk factors recorded, and the perpetration of further family incidents. Opportunities for further research are identified, including piloting and evaluation of any new or revised risk assessment tools developed in Victoria.

Keywords here: family violence, recidivism, re-offending, repeat, risk assessment, perpetrator characteristics, risk factors.

Introduction

Family violence is an issue of major concern for the Victorian community. The number of family incidents recorded by Victoria Police has increased markedly over the past five years, from 43,856 in 2011 to 74,385 in 2015 (Crime Statistics Agency, 2016), likely reflecting an increased focus on family violence by police, increased willingness of victims to report violence, an increase in the actual number of incidents occurring over time, or some combination of these factors. A detailed, evidence-based understanding of the characteristics and behavioural patterns of family violence perpetrators is vital for ensuring that intervention and prevention strategies are appropriately targeted. In particular, given that a recent analysis identified that alleged recidivist perpetrators accounted for almost three-quarters of all police-recorded family incidents in Victoria between 2006 and 2015 (Millsteed, 2016), increasing understanding of this group of perpetrators is an important step in addressing the incidence of and harm caused by family violence.

Overview of established risk factors for family violence recidivism

Prior research has identified that a number of factors are statistically associated with domestic violence recidivism, though the relationships between these factors and recidivism are not always straightforward. In addition, the vast majority of this research has been conducted in the United States and United Kingdom. Such research has focused on violence between current or former intimate partners, rather than using the broader definition of family violence used in Victoria, which includes various forms of violence such as physical, emotional and economic abuse, and a wide range of family relationships.

In terms of perpetrator characteristics, perpetrator gender has been consistently found to be related to recidivism, with males far more likely to re-perpetrate domestic or intimate partner violence than females (Klein, 2009; Puffett and Gavin, 2004; Wooldredge and Thistlewaite, 2005). Younger perpetrators have also been shown to be more likely

to re-perpetrate violence than older perpetrators (Klein, 2009; Puffett and Gavin, 2004; Ventura and Davis, 2005; Wooldredge and Thistlewaite, 2005; Wordes, 2000). Bennett Cattaneo and Goodman (2005) note that there is no strong evidence of a relationship between perpetrator ethnicity or race and recidivism.

Perpetrator unemployment, residential instability, low socio-economic status, living in a socio-economically disadvantaged neighbourhood and lower levels of educational attainment in the neighbourhood have all been shown to be risk factors for domestic violence recidivism (Bennett Cattaneo and Goodman, 2005; Hilton and Harris, 2005; Wooldredge and Thistlewaite, 2005).

A number of studies have also identified that the offending and domestic violence histories of perpetrators are correlated with recidivism, whereby the more extensive or enduring a perpetrator's history of violent behaviour, the more likely they are to perpetrate repeat incidents (Bowen, Gilchrist and Beech, 2005; Kingsnorth, 2006; Ménard, Anderson and Godboldt, 2009; Ventura and Davis, 2005; Wordes, 2000). Seriousness of prior violence appears to be a less important predictor of recidivism than length of the history of violence within the relationship (Bennett Cattaneo and Goodman, 2005).

Bennett Cattaneo and Goodman (2005) note that victim characteristics are rarely included in studies about domestic and intimate partner violence recidivism. In his review, Klein (2009) notes that with the exception of gender and age, victim characteristics have not been found to be associated with an increased risk of recidivism. He notes that female victims and younger victims are associated with increased risk. There are a number of studies that indicate a correlation between victim pregnancy and increased risk of experiencing violence (Brownridge et al., 2011; Campo, 2015; Taft, Watson and Lee, 2004). Some of these have identified that in relationships where there is pre-existing violence, pregnancy is associated with increases in severity of this violence. One study suggested that the increased risk is related more to the younger age of the women than the fact that they are pregnant (Weisz, Canales-Portalatin and Nahan, 2001). However, Taft, Watson and Lee's (2004) study of 14,784 young women aged 18 to 24 found that 27% of women who had been pregnant had experienced partner violence compared with 8% of women who had never been pregnant. The nature of the relationship is not clear and Campo (2015) notes that further research exploring the relationship between pregnancy and young women's experience of violence is required. It may be the case, for example, that young women who experience violence are at an increased risk of becoming pregnant compared to other women.

Though the majority of studies have focused only on violence perpetrated against current or former intimate partners as opposed to other types of family or domestic relationships, on balance the available evidence suggests that the type of relationship between the partners (e.g., dating, married, de facto) does not impact on likelihood of recidivism (Bennett Cattaneo and Goodman, 2005; Buzawa et al., 1999).

Finally, there is evidence to suggest a link between both acute and chronic alcohol and drug use and perpetration of further domestic violence incidents (Hilton and Harris, 2005; Hirschel and Dawson, 2000), and some studies have found that either perpetrator and/or victim use of drugs or alcohol at the time of the initial incident is related to the occurrence of repeat incidents (Felson, Ackerman and Gallagher, 2005; Hirschel et al., 2007; Orchowsky, 1999). However, one study identified that if the perpetrator's use of alcohol and drugs is controlled for, victim drug and alcohol use does not appear to be related to repeat incidents (Kyriacou, et al., 1999).

Assessing risk of recidivism

Research evidence on the risk factors that are associated with domestic violence perpetration and recidivism has been used in the development of risk assessment tools, designed to provide practitioners with a basis on which to determine level of risk and in turn, put appropriate risk management strategies in place. However, evidence about the capacity of risk assessment tools to accurately predict whether a perpetrator is likely to re-perpetrate family violence

is mixed. For example, the Domestic Violence Screening Instrument (DVSI) has been found to perform no better than chance in predicting controlling, threatening and less severe violent behaviour, but to be somewhat better than chance at predicting severe violence (Bowen, 2011). It has also been highlighted that these tools may only be applicable to the sample for which they have been validated, and so may not apply to all populations or settings (Bowen, 2011).

In a review of intimate partner violence risk assessment tools, Messing and Thaller (2013) assessed the predictive validity of five established tools reported in 25 studies using the Receiver Operating Characteristics Area Under the Curve (AUC) statistic. The AUC demonstrates the likelihood the model will produce a higher predicted probability of recidivism for recidivist perpetrators compared with non-recidivist perpetrators. An AUC of 0.5 indicates that a model has no ability to discriminate, an AUC between 0.7 and 0.8 indicates acceptable ability to discriminate, an AUC between 0.8 and 0.9 is considered to have excellent ability to discriminate, and an AUC greater than 0.9 is considered to have outstanding discrimination (Hosmer and Lemeshow, 2000). Messing and Thaller (2013) found that the Ontario Domestic Assault Risk Assessment (ODARA) had the highest average weighted AUC of 0.666 followed by the Spousal Assault Risk Assessment (SARA; AUC=0.628), the Danger Assessment (DA; AUC=0.618), the Domestic Violence Screening Assessment (DVSI; AUC=0.582) and the Kingston Screening Instrument for Domestic Violence (K-SID; AUC=0.537). Messing and Thaller (2013) found that these scores indicated all the tools predicted recidivism slightly better than chance, but statistically the AUCs indicate these tools do not have an acceptable ability to discriminate (Hosmer and Lemeshow, 2000). . Kropp (2004) notes that it may not be possible to develop a tool that calculates a cut-off score that will allow professionals to determine absolutely the risk of recidivism, given that IPV is not simply a function of particular risk factors, but that risk can be dynamic and influenced by the situational context and risk factors that vary with time.

Family violence risk assessment in Victoria

Since 2007, a specially-developed risk assessment and management tool, the Family Violence Risk Assessment and Risk Management Framework (also known as the common risk assessment framework, or CRAF) has been used by a range of Victorian government service providers. The CRAF was developed in consultation with stakeholders such as the police, the courts and family violence service providers and takes a structured professional approach to risk assessment (Department of Human Services, 2012). It includes a number of perpetrator, victim and relationship risk factors that have, according to those that developed the CRAF, been identified through research as being associated with a greater likelihood or severity of family violence (Department of Human Services, 2012).

The Victoria Police Family Violence Risk Assessment and Risk Management Report (known as the L17 form), which must be completed by police officers in relation to any alleged family incident reported to them (Victoria Police, 2014), includes risk factors that are similar but not identical to those outlined in the CRAF. The form also includes demographic information about the alleged perpetrator (also called the 'other party' or OTH) and victim (also called the affected family member or AFM), and the actions that police took. Victoria Police use the information on the L17 form to inform decisions about the safety and welfare of family violence victims, make an assessment about the likelihood of future family violence, and determine the most appropriate risk management strategy (Victoria Police, 2014).

Table 1 outlines the risk factors included in the L17 form and their mapping to the factors listed in the CRAF. It should be noted that while a number of CRAF risk factors in fact relate to the alleged perpetrator's entire history of family violence behaviour, the equivalent L17 risk factors appear to be related only to the current family incident police were responding to at the time. For example, the CRAF indicates an escalated risk if the perpetrator 'has ever tried to choke victim', and the equivalent L17 risk factor seems to indicate escalated risk if the perpetrator 'choked AFM' in the current incident.

Table 1: Mapping of CRAF and L17 risk factors

CRAF risk factor description	L17 Risk Factor(s) description
Perpetrator risk factors	
Use of weapon in most recent event	Firearms threatened/used
	Weapons (not firearms) used
Access to weapons	Perpetrator has firearms license
	Firearm(s) present at address
Has ever harmed/threatened to harm victim	Harmed/threatened to harm AFM
Has ever tried to choke victim	Choked AFM
Has ever threatened to kill victim	Threatened to kill AFM
Has ever harmed/threatened to harm/kill children	Harmed or threatened harm/kill children
Has ever harmed/threatened to harm/kill other family members	Harmed or threatened harm/kill family
Has ever harmed/threatened to harm/kill pets	Harmed or threatened harm/kill pets
Has ever threatened/ attempted suicide	Suicidal ideas/attempted suicide
Stalking of the victim	Stalked AFM
Sexual assault of the victim	Sexual assault of AFM
Previous/current breach of intervention order	Breach of current/previous IO
Drug/alcohol misuse	Alcohol use possible
	Alcohol use definite
	Drug use possible
	Drug use definite
Obsession/jealous behaviour towards victim	No L17 equivalent
Controlling behaviour	Controlling behaviours
Unemployment	Unemployed
Depression/ mental health issue	Depression/mental health issue
History of violent behaviour	History violent behaviour
Victim risk factors	
Pregnancy/new birth	Pregnancy/new birth
Depression/mental health issue	Depression/mental health issue
Drug/alcohol misuse	Alcohol use possible
	Alcohol use definite
	Drug use possible
	Drug use definite
Suicidal ideas/attempted suicide	Suicidal ideas/attempted suicide
Social isolation	Isolation
Relationship risk factors	
Recent separation	Recent separation
Escalation/increase in severity/frequency	Escalation – increase in severity and/or frequency
Financial difficulties	Financial difficulties

The current study

The fact that since late 2004, Victoria Police have been required to complete a CRAF-based risk assessment for every family incident that is reported to them by completing the L17 form (Victoria Police, 2014) presents a unique opportunity to examine the capacity of the CRAF risk factors to predict alleged family violence recidivism. This work is particularly timely, given that the Royal Commission into Family Violence recently recommended that the CRAF be

reformed by the end of 2017 (State of Victoria, 2016a) and the predictive validity of the CRAF in determining which alleged perpetrators will perpetrate further incidents does not appear to have been evaluated previously. Further, the vast majority of prior research discussed above is based on intimate partner violence, and the extent to which such research is generalisable more broadly to family violence as defined by the Victorian *Family Violence Protection Act (2008)* has not been examined.

A key component of commissioned research the CSA completed for the RCFV—from which this analysis is drawn—sought to begin to address these gaps in the existing evidence base by conducting a research study to statistically analyse the levels and predictors of recidivism amongst alleged family violence perpetrators in Victoria (see State of Victoria, 2016b).

The current study uses data recorded by Victoria Police on the L17 form to examine recorded recidivist family violence behaviour and to assess the utility of the L17 form in predicting recidivism. Specifically, this study aims to answer the following research questions:

1. How many alleged family violence perpetrators are recorded for more than one family incident?

2. What are the differences between alleged recidivist and non-recidivist perpetrators in terms of their characteristics, family violence histories and other risk factors?

3. Is it possible to predict which alleged perpetrators will have a recorded recidivism incident based on their characteristics, risk factors or other information recorded by police at the first incident?

This study draws upon on Victoria Police recorded family incident data only. However, it should be acknowledged that many family incidents never come to the attention of police. There are also a wide range contextual factors that are not systematically recorded by police, but that impact on the frequency and seriousness of family incidents. Further, it should be noted that police recorded recidivism is just one of a variety of outcome indicators associated with family violence intervention policy and practice. While recidivism incidents are an adverse outcome to the extent that they indicate repetition of violent behaviour towards victims, they can also be interpreted as an indicator of increased victim willingness to contact police and/or police follow-up and involvement where there are ongoing concerns for victims' safety.

Method

This study used data relating to family incidents recorded by police from 1 July 2004 to 30 March 2015. This data includes all information recorded by police on the L17 form and lodged on Victoria Police's Law Enforcement Assistance Program (LEAP) database. The Victoria Police Code of Practice for the Investigation of Family Violence states that police complete the form for all family incidents, interfamilial-related sexual offences and instances of child abuse reported to them, and that prior to leaving the scene of a family incident, police officers must collect 'all the information needed to complete the Family Violence Risk Assessment and Risk Management Report' (Victoria Police, 2014: p.10).

To identify patterns and predictors of recidivism, a cohort of alleged perpetrators whose behaviour could be tracked over time within the dataset was selected. The cohort of all individuals who were recorded by police as perpetrating at least one family incident in the 2010—11 financial year was selected for the purpose of this analysis. These are individuals who were recorded by police as "Other Parties" on at least one L17 form in 2010—11. Selection of this cohort enabled analysis of recidivism behaviour for a minimum of three years and nine months for each perpetrator to the end of March 2015. In addition, selecting this cohort meant that the analysis could examine whether a perpetrator's recorded historical family violence behaviour in prior years (between July 2004 and June 2010), impacted on their propensity to reappear in the dataset as a recidivist perpetrator.

In this study an alleged perpetrator's *index incident* was defined as the first time they were recorded for a family incident by police on or after 1 July 2010. If a perpetrator was recorded for a further incident after their index incident but prior to 31 March 2015, they were considered to be a recidivist perpetrator, and this second incident was defined as their *recidivism incident*. Any incidents recorded against perpetrators after their recidivism incident but prior to 31 March 2015 were defined as *further incidents*. Figure 1 provides examples of how this methodology could apply to individual perpetrators.

For the purpose of this report, references to perpetrators and incidents refer to alleged rather than proven perpetrators and incidents. References to recorded offences arising from family incidents also refer to alleged rather than proven offences as the LEAP database does not hold court outcome data regarding whether offences recorded by police went on to be proven in court.

Figure 1: Methodology for identification of index and recidivism incidents
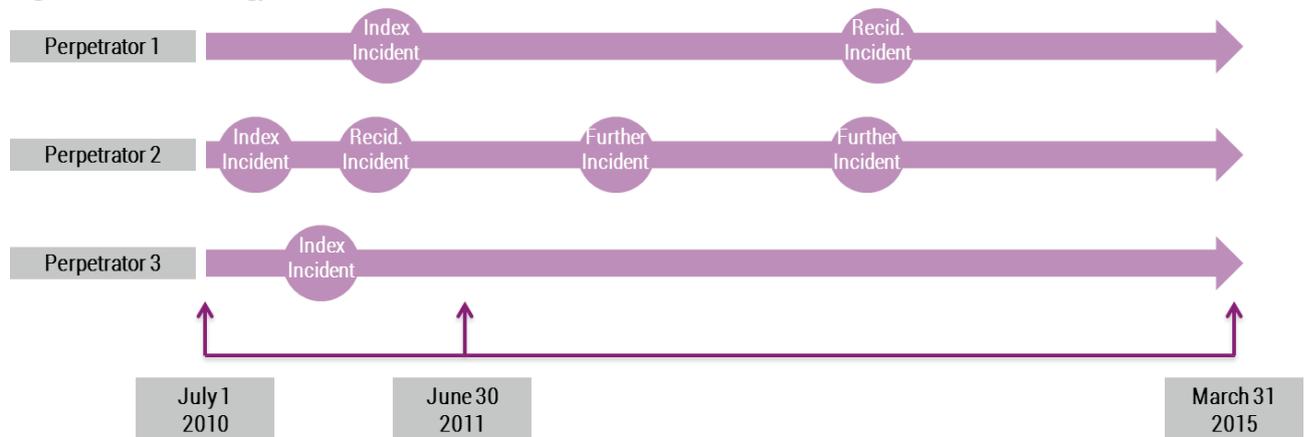
The dataset used for the recidivism analysis included alleged perpetrator characteristics, items related to perpetrators' family violence histories, characteristics of perpetrators' index incidents as recorded by police, and data relating to recidivism outcomes. A summary of the all of the data items included is provided in Table 2.

Table 2: Data items

Category	Data items
Alleged perpetrator characteristics	- Sex - Age at time of index incident - Relationship between perpetrator and victim
Alleged perpetrator family incident history	- Total number of recorded family incidents prior to July 1 2010 - Total number of breaches of family violence orders prior to July 1 2010
Characteristics of index incident	- L17 Risk factors recorded by police at index incident - Police assessment of overall risk of future violence (unlikely, likely) - Victim fear level (not fearful, fearful, very fearful) - Whether children were present at the index incident - Whether presence of a disability was recorded at the index incident - Actions recorded by police on the L17 form (including criminal, civil and referral actions)

Category	Data items
	• Recorded offences arising from the family incident
Recidivism outcomes	• Whether a perpetrator was recorded for a further incident • Total number of recorded recidivism and further incidents

Statistical analysis

Chi-square analyses (indicated by the symbol: χ^2) were used to examine whether there were bivariate relationships between potential predictors of recidivism (including alleged perpetrator characteristics, perpetrators' recorded family violence histories and/or the characteristics of their index incident), and whether or not a recidivism incident was recorded. Where the significance level (indicated by the symbol p) is less than .05, this indicates that there was a statistically significant relationship between the predictor variable being tested and recidivism. The closer the significance level is to zero, the less likely it is that the results of the statistical test presented could have occurred by chance, or conversely, the more likely it is that the results represent true relationships between factors tested and recidivism in the population, as opposed to random variation in the data.

Following these initial chi-square analyses, potential predictors that had a statistically significant bivariate relationship with recidivism (at the $p<.05$ level) were included in a logistic regression model. This overall model was used to determine which combination of explanatory factors is most useful in determining whether or not someone will be recorded for a recidivism incident, and how likely it is that this combination of factors will correctly identify recidivist and non-recidivist perpetrators.

Results

Alleged perpetrator characteristics

A total of 30,695 unique perpetrators were recorded by police for at least one family incident in 2010–11, though not all data items were recorded for every perpetrator or every index incident. Of those where the sex of the perpetrator was recorded (n=30,562), 77% (n=23,427) were male and 23% (n=7,135) were female. The median age of perpetrators at the time of their index incident was 34 years old, and the mean age was 34.29 (SD=12.52). Relationship between perpetrator and victim was recorded for the majority (89% or 27,296) of index incidents. Overall, for 65% (n=17,771) of those incidents the type of relationship between perpetrator and victim was current or former partner and for 35% (n=9,525) the type of relationship was other family member.

Alleged perpetrators' recorded family violence histories

Over half of the perpetrators recorded for an index incident (61%, n=18,598) did not have a prior family incident recorded by police. However, 17% (n=5,135) had one prior incident recorded and a further 13% (n=3,965) had two or three prior incidents recorded. The remaining 10% (n=2,997) had more than three incidents recorded. These prior incidents did not necessarily relate to the same victims.

Data relating to recorded offences for breaches of family violence intervention orders (dating back to the 2004–05 financial year) prior to the index incident date was also extracted. Again, these orders were not necessarily related to the victim involved in the index incident. Nevertheless, 91% (n=27,843) of perpetrators had no prior recorded breaches of family violence orders, 7% (n=2,087) had one prior breach of a family violence order and 2% (n=765) had two or more breaches of family violence orders.

Index incident characteristics

L17 risk factors are completed by police officers using checkboxes, and the majority of these were only checked for a very small proportion of index incidents. The majority of incidents (70%; n=21,500) across all relationship types had between one and four risk factors recorded out of a possible 33 risk factors. A slightly higher proportion of incidents between those who were separated (20%; n=683) or in a de facto relationship (21%; n=1,373), compared with other relationship types, had five or more risk factors recorded at the index incident.

Children were recorded by police as being present at 36% (n=10,945) of index incidents, and police noted the presence of a disability in 3% (n=761) of incidents, though the L17 form did not require police officers to specify whether the victim, the perpetrator or a child present at the time of the incident had a disability. Victim fear level at the time of the incident was recorded for the majority of index incidents (94% or 28,962). Where this was recorded, 61% (n=17,652) were recorded as 'not fearful', 29% (n=8,299) were recorded as 'fearful', and 10% (n=3,011) were recorded as 'very fearful'. Police also provided an overall risk assessment for 65% (n=19,901) of all index incidents. They assessed the overall risk of further violence as likely for 48% (n=9,465) of those index incidents and as unlikely for the remaining 52% (n=10,436) of incidents.

Police actions

In addition to indicating which risk factors were present at an incident, police officers can select, again using checkboxes on the L17 form, which criminal, civil, referral or other actions they took or intended to take as a result of the family incident.

In total, 7% (n=2,049) of index incidents did not have any police action recorded. Referral actions were most frequently recorded, with 88% (n=27,058) of incidents recorded as having at least one referral action. Though police recorded taking criminal action for only 17% (n=5,163) of incidents, police offence records arising from these index incidents indicate that criminal offences were actually recorded as a result of 30% (n=9,331) of incidents. While these criminal offences are alleged rather than proven, this may indicate that police criminal actions arising as a result of this cohorts' index incidents were underreported on the L17 form.

Where an offence was recorded arising from a family incident, the most commonly recorded principal offence—the most serious offence recorded for the incident, as defined by the CSA's offence index (Crime Statistics Agency, 2015)—was assault, which accounted for 65% (n=6,022) of all recorded offences.

Overall recidivism rates

Overall, just over half (51%, n=15,611) of all perpetrators recorded for at least one incident in 2010–11 were recorded for a further family incident between the time of their index incident and the end of March 2015, and 49% (n=15,084) were not recorded for a further incident. The median number of further incidents amongst recidivist perpetrators who did have a recidivism incident was two and the mean number of further incidents was 3.35 (SD=3.43).

Recidivism by alleged perpetrator and index incident characteristics

Significant bivariate relationships were found between all of the perpetrator characteristics analysed—sex, age at index incident, relationship between victim and perpetrator, perpetrator's number of recorded prior family incidents, and whether the perpetrator has prior recorded breaches of family violence orders—and recidivism. Specifically, the nature of these relationships was that:

- Males were more likely to be recorded for a recidivism incident: they made up 81% (n=12,687) of those recorded for a recidivism incident compared with only 72% (n=10,740) of those not recorded for a recidivism incident.

- People aged 34 or younger (58%; n=8,809) at the time of their index incident were more likely to be recorded for a recidivism incident, whereas people aged 45 or older (14%; n=2,200) were less likely to be recorded for a recidivism incident.
- A higher proportion of perpetrators were recorded for recidivism incidents where the relationship type between perpetrator and victim was de facto (25% [n=3,821] of recidivist perpetrators compared to 17% [n=2,569] of non-recidivist perpetrators) or boyfriend/girlfriend (10% [n=1,555] of recidivist perpetrators compared to 8% [n=1,288] of non-recidivist perpetrators). Where the relationship was divorced, married or other family member, perpetrators were less likely to be recorded for a recidivism incident.
- Perpetrators who had previously been recorded for family incidents were more likely to be recorded for a recidivism incident. Those recorded for one or two prior incidents made up 31% (n=4,769) of recidivist perpetrators compared with 19% (n=2,891) of non-recidivist perpetrators, and those recorded for three or more prior incidents made up 23% (n=3,584) of recidivist perpetrators compared with just 6% (n=853) of non-recidivist perpetrators. On the other hand those with no prior recorded incidents made up 76% (n=11,540) of non-recidivist perpetrators and 46% (n=7,058) of recidivist perpetrators.
- Perpetrators who had been recorded for a breach of a family violence order prior to their index incident were more likely to be recorded for a recidivism incident. They made up 14% (n=2,220) of recidivist perpetrators compared with just 4% (n=632) of non-recidivist perpetrators.

All of the recorded index incident characteristics—victim fear level, police overall assessment of risk of further violence, whether children were present at the index incident, and whether disability was present at the index incident—also had significant bivariate relationships with recidivism. Where victim fear level was recorded as 'not fearful' at the index incident, perpetrators were less likely to be recorded for a recidivism incident. These perpetrators made up 58% (n=8,645) of recidivist perpetrators compared with 64% (n=9,007) of non-recidivist perpetrators. On the other hand, where victim fear level was 'fearful' or 'very fearful' perpetrators were more likely to be recorded for a recidivism incident. They made up 30% (n=4,463) of recidivist compared with 27% (n=3,836) of non-recidivist perpetrators where victims were 'fearful', and 11% (n=1,692) of recidivist compared with 9% (n=1,319) of non-recidivist perpetrators where victims were 'very fearful'.

Where police made an assessment of future risk of violence, they assessed the risk as 'unlikely' for 45% (n=4,599) of recidivist perpetrators and as 'likely' for the remaining 55% (n=5,532). Conversely, they assessed the risk as 'unlikely' for 60% (n=5,837) of non-recidivist perpetrators, and as 'likely' for the remaining 40% (n=3,933). Overall, the police officer's assessment of further violence was 'correct' (to the extent that further incidents did or did not come to the attention of police within the analysis window) in 57% (n=11,369) of index incidents, indicating that their assessments were slightly better than chance at predicting recidivism over this timeframe. It should be noted, however, that risk can change over time and police risk assessments are based on the situation at the time of the recorded incident. Recorded presence of children and presence of a disability at the index incident were both associated with a slightly increased likelihood or recidivism.

Tables 3 and 4 show the bivariate relationships between recidivism and each of the risk factors recorded by police at the index incident. They present both the number and proportion of recidivist perpetrators who did not have a specific risk factor recorded at their index incident compared to those that did have the risk factor recorded. Where the 'significance level' column indicates a significant relationship, and the proportion of recidivists that did have the risk factor present is larger than the proportion that did not, this indicates a positive relationship between presence of the risk factor and recidivism.

As shown, the analyses indicated that there were significant associations between the majority of risk factors and recidivism. Risk factors that did not have an association with recidivism included: victim depression/mental health issue; victim suicidal ideas/attempted suicide; recent separation; perpetrator use of weapons (not firearms); perpetrator harmed or threatened to harm/kill children; and, perpetrator stalked victim.

Table 3: Bivariate relationships between victim and relationship risk factors and recidivism

L17 form risk factors	Alleged perpetrators without risk factor present who had a recidivism incident		Alleged perpetrators with risk factor present who had a recidivism incident		Significance
	n	%	*n*	%	*p*
Victim risk factors present at index incident					
Pregnancy/new birth	14,323	49.4	1,088	64.6	<.001
Depression/mental health issue	13,949	50.2	1,462	50.2	Not Significant
Alcohol use possible	13,155	49.3	2,256	56.2	<.001
Alcohol use definite	12,876	49.3	2,535	55.4	<.001
Drug use possible	13,556	48.8	1,855	63.6	<.001
Drug use definite	15,060	49.9	351	67.2	<.001
Suicidal ideas/attempted suicide	15,249	50.2	162	54.0	Not Significant
Social isolation	15,011	50.3	400	45.7	.01
Relationship risk factors present at index incident					
Recent separation	11,617	50.3	3,794	50.0	Not Significant
Escalation – increase in severity or frequency	14,238	49.7	1,173	57.3	<.001
Financial difficulties	13,815	49.7	1,596	54.7	<.001

Table 4: Bivariate relationships between alleged perpetrator risk factors and recidivism

L17 form risk factors	Alleged perpetrators without risk factor present who had a recidivism incident		Alleged perpetrators with risk factor present who had a recidivism incident		Significance level
	n	%	*n*	%	*p*
Firearms threatened/used	15,322	50.3	89	42.4	.02
Weapons (not firearms) used	15,187	50.1	224	54.5	Not Significant
Perpetrator has firearms license	15,245	50.4	166	36.8	<.001
Firearms present			55	36.9	<.001
Harmed/threatened to harm AFM	12,663	48.6	2,748	59.2	<.001
Choked AFM	14,927	50.0	484	56.8	<.001
Threatened to kill AFM	14,657	49.8	754	58.8	<.001
Harmed or threatened harm/kill children	15,213	50.1	198	55.0	Not Significant

L17 form risk factors	Alleged perpetrators without risk factor present who had a recidivism incident		Alleged perpetrators with risk factor present who had a recidivism incident		Significance level
	n	%	*n*	%	*p*
Harmed or threatened harm/kill family	15,136	50.0	275	60.7	<.001
Harmed or threatened harm/kill pets	15,328	50.2	83	60.1	<.001
Suicidal ideas/attempted suicide	14,887	50.0	524	57.1	<.001
Stalked AFM	15,166	50.2	245	53.6	Not significant
Sexual assault of AFM	15,272	50.4	139	37.9	<.001
Breach of current/previous Intervention Order	14,676	49.5	735	69.1	<.001
Alcohol use possible	12,805	49.2	2,606	55.9	<.001
Alcohol use definite	11,295	48.4	4,116	56.0	<.001
Drug use possible	12,372	47.6	3,039	64.3	<.001
Drug use definite	14,498	49.4	913	66.7	<.001
Controlling behaviours	12,902	49.7	2,509	53.2	<.001
Unemployment	13,744	49.0	1,667	63.7	<.001
Depression/mental health issue	13,098	49.4	2,313	55.7	<.001
History of violent behaviour	13,994	49.1	1,417	65.7	<.001

Finally, analyses were conducted to determine whether there were bivariate relationships between police actions recorded on the L17 and whether a perpetrator goes on to be recorded for a recidivism incident. All actions taken by police that had significant relationships with recidivism were associated with a slightly increased likelihood of recidivism, with the exception of informal referrals for both perpetrators and victims, and revocation of firearms licenses. For example, of all perpetrators where police recorded the criminal action 'charges pending (breach and other)', 68% (n=349) were recorded for a recidivism incident, whereas when police did not record this action, 50% (n=15,062) went on to be recorded for a recidivism incident.

A significant relationship was found between whether recorded criminal offences arose from the index incident and recidivism, though the size of the relationship was very small. Where offences were recorded, 51% (n=4,800) of perpetrators were recorded for a recidivism incident, whereas where no offences were recorded 50% (n=10,611) were recorded for a recidivism incident.

Final recidivism model

All of the factors that were identified as having significant bivariate relationships with likelihood of recidivism in the previous section were included in a logistic regression model to explore which combination of these variables had the most predictive validity in determining who, following their index incident, went on to be recorded for a recidivism incident. The final model excludes any variables that do not have any relationship with recidivism, when the effects of all other possible predictor variables are taken into account.

Note that this technique excludes perpetrators who had missing data on one or more of the variables included in the model. The final model was based on 17,792 perpetrators. The majority of perpetrators excluded were missing data

on police assessment of risk of future violence at the index incident.

The overall adequacy of the model was assessed according to its ability to discriminate between those perpetrators who went on to be recorded for a recidivism incident and those who were not, using the ROC Area Under the Curve statistic (AUC). In other words, this statistic can be interpreted as the likelihood that the model will produce a higher predicted probability of recidivism for recidivist perpetrators compared with non-recidivist perpetrators. The better the model's overall ability to discriminate between recidivist and non-recidivist perpetrators, the more accuracy the model, (and the information on factors included in the model as recorded by police at the index incident), have in predicting recidivism. An AUC of 0.5 indicates the model has no ability to discriminate, an AUC between 0.7 and 0.8 indicates acceptable ability to discriminate, an AUC between 0.8 and 0.9 is considered to have excellent ability to discriminate, and an AUC greater than 0.9 is considered to have outstanding discrimination (Hosmer and Lemeshow, 2000). The AUC for the final model presented here was 0.72 (95% Confidence Interval: 0.71, 0.73), indicating that there is a 72% chance that the final recidivism model will produce a higher probability of recidivism for recidivist perpetrators in the 2010–11 cohort, and the model has acceptable ability to discriminate between those who will and will not go on to be recorded for a recidivism incident.

The final predictor variables included in the model are presented in Table 5. These are the factors that contribute significantly to predicting recidivism, taking into account the effects of all other variables included in the model. The odds ratio column can be interpreted as the likelihood that a perpetrator with that characteristic will go on to be recorded for a recidivism incident. For example, males were 1.53 times more likely to be recorded for a recidivism incident than females.

In summary, the odds ratios presented in Table 5 indicate that:

- Perpetrators recorded for a recidivism incident are more likely to be male than female.
- For every year of increase in age at time of incident, the likelihood of being recorded for a recidivism incident decreases slightly.
- Perpetrators whose index incident is against a current or former partner are more likely to be recorded for a recidivism incident than those whose index incident is against another type of family member.
- Perpetrators with one to two prior recorded family incidents are 2.26 times more likely to be recorded for a recidivism incident than those with no prior recorded incidents, and perpetrators with three or more prior recorded incidents are 4.5 times more likely to be recorded for a recidivism incident.
- Perpetrators with a prior recorded offence for a breach of a family violence intervention order are more likely to be recorded for a recidivism incident.
- Where police assess future risk of violence as 'likely' at the index incident, perpetrators are more likely to be recorded for a recidivism incident.
- If recorded criminal offences arose from the index incident, perpetrators were slightly less likely to be recorded for a recidivism incident.
- Recidivist perpetrators were more likely to have the following risk factors recorded by police at the time of their index incident: perpetrator unemployed; perpetrator depression/mental health issue; victim pregnancy or new birth; escalation – increase in severity or frequency; perpetrator drug use possible or definite; and/or victim alcohol use possible or definite.
- Perpetrators were less likely to be recorded for a recidivism incident when police recorded victim social isolation or perpetrator possession of a firearms license at the index incident.
- Presence of children at the index incident was associated with a higher likelihood of recidivism.
- The only police recorded action on the L17 form at the index incident that contributed significantly to predicting recidivism in the final model was for criminal charges pending for a breach of a family violence order. Where this action was recorded, it was associated with an increased likelihood of recidivism.

Table 5: Logistic regression model comparing odds of recidivism versus no recidivism

Predictor	Odds Ratio	95% Confidence Interval of the Odds Ratio	Significance level (p)
Sex (male vs female)	1.53	1.42, 1.65	<.001
Age at time of index incident (per additional year of age)	0.98	0.97, 0.98	<.001
Relationship between perpetrator and victim (current or former partner vs other family member)	1.12	1.04, 1.20	.002
Number of prior incidents			
1-2 prior incidents	2.26	2.09, 2.43	<.001
3 or more prior incidents	4.50	4.00, 5.06	<.001
Prior breach of FV order	1.47	1.27, 1.69	<.001
Police risk assessment (likely vs unlikely)	1.33	1.24, 1.43	<.001
Whether recorded offences arose from index incident	0.81	0.76, 0.88	<.001
Perpetrator unemployed	1.20	1.06, 1.35	.003
Perpetrator depression/mental health issue	1.56	1.35, 1.80	.002
Perpetrator has firearms license	0.68	0.52, 0.88	.004
Victim pregnancy or new birth	1.83	1.53, 2.19	<.001
Victim isolation	0.78	0.65, 0.94	.009
Escalation – increase in severity or frequency	1.15	1.02, 1.31	.03
Children present at index incident	1.15	1.07, 1.22	<.001
Perpetrator – drug use possible	1.49	1.36, 1.64	<.001
Perpetrator – drug use definite	1.37	1.16, 1.61	.001
Victim – alcohol use possible	1.19	1.08, 1.31	<.001
Victim – alcohol use definite	1.21	1.10, 1.32	<.001
Criminal charges pending for breach of family violence order	1.37	1.07, 1.76	.01

Discussion

Within the 2010–11 cohort of alleged perpetrators whose recidivism behaviour was analysed for this research, just over half were recorded for at least one further family incident by 30 March 2015. The overall recidivism model highlighted a number of perpetrator, family violence history, and index incident characteristics that contribute significantly to predicting who will go on to be recorded for a recidivism incident. Some of the factors that were found to contribute significantly to predicting recidivism are consistent with the findings of other research in this area. The finding that having prior family incidents, a prior breach of a family violence order, or criminal charges pending for breach of a family violence order, was predictive of recidivism is consistent with other studies that have found that prior offending is associated with recidivism (Bowen et al, 2005; Kingsnorth, 2006; Ménard et al, 2009). The finding that perpetrator drug use (possible or definite) was predictive of recidivism is consistent with Ménard and colleagues' (2009) finding that drug use was associated with recidivism.

Taken together, all of the information collected by police recorded at index incidents in 2010–11 could only be used to develop a model that, statistically, had 'acceptable' ability to discriminate between recidivist and non-recidivist perpetrators. However, the AUC for the final model (0.72) was higher than the average weighted AUC for any of the five tools previously assessed by Messing and Thaller (2013), which ranged from 0.537 to 0.666.

A number of L17 risk factors did not contribute significantly to predicting whether a perpetrator would be recorded for a further incident, though this information may have other value for police in the assessment and management of

family incidents and harm arising from them. As outlined earlier, Victoria Police use the L17 form to inform decisions about the safety and welfare of family violence victims and determine the most appropriate risk management strategy, in addition to using it to make an assessment about the likelihood of future family violence (Victoria Police, 2014). Perhaps it is the case, for example, that police make use of the items that were non-significant predictors to assess the risk of increased seriousness or frequency, or to establish a risk management strategy for the perpetrator and/or victim. Some of these items related to potential harms to victims, information that is of potential relevance for referral agencies.

Where police recorded their intended actions on the L17 form these were, for the most part, associated with a slightly increased likelihood of recidivism. These results may be biased in the sense that police might be more likely to take action in response to a family incident where they perceive an elevated risk of recidivism. In other words, perpetrators involved in incidents where police record actions could already have a higher propensity to perpetrate further incidents before police take such action.

Limitations and further research

A key limitation of this study is that some perpetrators may have spent time in custody throughout the study period, reducing their 'free time' to perpetrate offences and data on this was not available to the CSA for inclusion in the study. This could lead to imprecise estimations of the true proportion of recidivist perpetrators within the study period.

As mentioned in the method, in this study references to perpetrators, incidents and recorded offences refer to alleged rather than proven perpetrators, incidents and offences. As the CSA does not currently match court outcome data regarding whether offences went on to be proven in court, the study does not report confirmed recidivist incidents and so could be overestimating recidivism slightly. In addition, recording practices by Victoria Police may change over time and so impact on the number of incidents recorded.

The quality of police recording of risk factors is unknown. Risk factors are selected via check boxes and the absence of a check for a particular risk factor may indicate that the data was not assessed and/or recorded, not just that it was not present. A number of perpetrators were excluded from the study as they were missing data on one or more of the variables included in the final model. Their exclusion may mean the model is biased towards incidents where all of the data items are recorded.

A number of additional opportunities for further research were identified through the process of conducting the exploratory analysis presented here. First, refinement of the modelling presented here could be achieved by testing the validity of the model for other cohorts of perpetrators (for example, by defining the index incident based on a different year and re-running the modelling process).

As mentioned earlier, some of the factors that did not contribute significantly to predicting recidivism may be used by police or referral agencies to inform decisions about other risks or the establishment of a risk management strategy. Depending on the other uses that police and referral agencies make of the L17 form and what, specifically, they are attempting to predict, this research could be extended to determine which perpetrator or index incident characteristics have validity in predicting seriousness or frequency of recidivism.

A research method termed propensity score matching could be used to control for these existing differences in propensity to re-perpetrate, which would enable more precise evaluation of the true impact of actions taken by police on recidivism levels. Again, this could be an avenue for further analysis in the future.

Linking data from additional sources to the Victoria Police data used for this analysis could also improve the adequacy of the modelling. Incorporating correctional services data on any time that perpetrators spent in custody

following their index incident would enable a more accurate comparison of who goes on to perpetrate further incidents. Further, incorporating data from the courts on whether family violence intervention orders were in place throughout the study period, and the start and end dates of these orders, would enable analysis of the impact of these orders on the propensity to re-offend. Linking these datasets would enable development of a more comprehensive model, incorporating all potential predictors of recidivism.

Prior to the rollout of any new or modified risk assessment tools, a piloting and evaluation process incorporating similar modelling methods to those presented here would assist in determining the validity of these tools in predicting recidivism (or other outcomes of interest). Ideally, any pilots undertaken would involve the identification and use of both control sites and pilot sites so that new tools can be adequately compared with existing practice. Identification of required evaluation data in the planning stage of any pilot would also be vital to ensure the success and rigour of the evaluation.

As previously mentioned, recent research found that the 6.9% of perpetrators who committed five or more family incidents between 2006 and 2015 were responsible for 30.7% of all family incidents (Millsteed, 2016). Statistical analysis to determine whether these perpetrators are significantly different from other perpetrators recorded for family incidents could provide useful insights for targeting family violence policy and practice. It could also be instructive to analyse in detail the characteristics and family violence histories of those who perpetrate very serious family incidents.

This study did not consider the extent to which an individual perpetrator commits violence against one or multiple victims, though future research could examine this. Finally, analysis of the relationships between perpetrators' recorded family incidents and other recorded offence types, such as drug offences and non-family violence related assaults, could provide additional insights into the behaviours of family violence perpetrators over time.

Acknowledgements

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