Effective management of serious police misconduct: A machine learning analysis

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Abstract | There are a range of management strategies available to police agencies to prevent serious misconduct. While many of these strategies are well accepted practice, there is limited empirical evidence demonstrating their effectiveness.

This study uses partial dependence plots to explore management strategies which have been identified as either increasing or decreasing risk of serious police misconduct. These include the provision of awards or complimentary remarks to officers, remedial action resulting from sustained complaints, and transfers between workplaces.

Expedient and opportune complaint resolution processes at a local level, positive behavioural reinforcement, and having a diverse range of career opportunities help prevent serious misconduct by police officers.

Systems of discipline feature among most organisations across both public and private sectors in Australia. These systems typically comprise three components, including standards of expected conduct and behaviour of staff, processes for managing non-compliance with the standard, and methods of managing more serious behavioural breaches (Office of Police Integrity 2007). Broadly, disciplinary systems are established to protect organisations from conduct that would undermine the effective pursuit of their objectives (Crime and Misconduct Commission 2010). For policing agencies, effective systems of internal discipline are particularly important. In addition to upholding appropriate standards of behaviour, systems of discipline are crucial to maintaining public confidence in police, and ensuring application of the rule of law (Crime and Misconduct Commission 2010; Office of Police Integrity 2007). These management strategies have vital roles to play in not only ensuring organisational fairness and consistency but also maintaining community confidence and public trust (Roberts & Herrington 2013).

Historically, systems of organisational discipline have been punitive in nature, based on the notion that punishment will deter poor employee behaviour in the future (Grote 1995; Noon 2001; Von Bergen & Bandow 2012). Punitive systems are typically based on the strategy of progressive discipline, in which more severe penalties are imposed for each subsequent violation of an organisation's rules of conduct by an employee (Royal Canadian Mounted Police External Review Committee 1992). Punitive approaches typically fail to consider and address the contributors to poor employee behaviour, particularly when such issues extend beyond the individual to the broader, structural problems of an organisation (Krawiec 2005). As such, punitive models have been criticised as an outdated and inadequate method of promoting effective workplace behaviour, and are considered counterproductive to the objectives of organisational discipline (Chimezie & William 1990; Grote 1995; Hlongwane & Kgosinyane 2017).

Recognition of the failings of punitive discipline has led to a trend towards positive or remedial discipline approaches (Grote 1995). Successive reviews of police discipline systems in Australia over recent times have criticised punitive aspects and recommended a shift towards more remedial approaches (Office of Police Integrity 2007; Wood 1997a).

Remedial management systems prioritise managerial interventions and rehabilitation over punishment. Management models such as these are designed to encourage employees to meet required standards (Office of Police Integrity 2007) and to remedy any issues in the workplace before they become critical. Supervisors in particular are empowered to take greater responsibility for identifying and addressing poor performance (Crime and Misconduct Commission 2010). While elements of the punitive and progressive approaches are generally retained, such as progressively serious interventions and the option to dismiss unsuitable employees, the focus is primarily on providing every opportunity for staff to correct problematic behaviour (Grote 1995; Office of Police Integrity 2007).

Police agencies now have a range of strategies available to them—both punitive and remedial in nature—to prevent serious misconduct. While many of these strategies are well accepted practice, and have been embedded within police management of career progression and strategies to deal with less serious misconduct, there is limited empirical evidence demonstrating their effectiveness. In addition, there is limited understanding of which officers are at higher risk of misconduct, how certain factors influence behaviour, and how the impact of strategies might vary over the course of an officer's career.

A large police dataset relating to serious misconduct among sworn officers was previously analysed by Cubitt, Wooden and Roberts (2020) to explore predictors of serious misconduct among police. The present study aims to extend the previous analysis to consider the role of specific management strategies in preventing misconduct and the implications for policing agencies. To do so, the relationship between select variables from this model and serious misconduct committed by police officers in New South Wales was considered. Serious misconduct in this jurisdiction is defined by section 10 of the *Law Enforcement Conduct Commission Act 2016* (NSW) as 'conduct…that could result in prosecution of the officer…for a serious offence or serious disciplinary action against the officer…for a disciplinary infringement'. In New South Wales, all instances of serious misconduct are considered by an internal police panel of senior officers, known as the Internal Review Panel, which determines the action to be taken against an officer (NSW Police Force 2012). Examples of serious misconduct may include single incidents, such as improper use of force or powers, or a sequence of poor performance considered significant enough to require consideration of dismissal.

Methodology

This study used partial dependence plots (PDP) as a post-hoc analysis to interrogate the specific interaction between certain management practices and serious misconduct. PDPs demonstrate the relationship between the outcome variable, in this instance serious police misconduct, and the independent variables within the model. Random forests detail the importance of independent variables in predicting the outcome but provide little information regarding specific individual points within those variables that facilitate a strong prediction rate. PDPs are a valuable technique for interpreting the random forest, as they provide insight into the point within variables that were most and least important in making predictions (Zhao & Hastie 2019). The random forest model developed by Cubitt, Wooden and Roberts (2020) is used as the basis for this research. This prior study analysed a sample of 600 sworn police officers with substantiated instances of serious misconduct and a matched sample of 600 control officers. This misconduct sample accounted for 30 percent of NSW Police Force officers who had been considered for serious misconduct over the 13-year period between January 2003 and October 2016. Demographic data, complaints data and management action data were sourced for all officers in the sample.

Given the volume of data available for analysis, a classification trees model was preferred—specifically, random forest (Berk 2013). This is a machine learning method by which data are arranged into an ensemble of classification trees to inductively discern nonlinear functions and interactions between variables (Berk 2013). One of the primary benefits of a random forest analysis is the ability to train the model to find structures and interactions that would not ordinarily be discerned by, for example, a multivariate linear regression (Berk 2013). Put more simply, it is a more sensitive analytic approach than linear modelling, and has been demonstrated to consistently outperform logistic regression in classification tasks (Couronné, Probst & Boulesteix 2018). In criminology, similar analyses have been used to effectively predict recidivism among homicide offenders (Neuilly et al. 2011), recidivism among offenders while on parole (Berk et al. 2009) and domestic violence offending (Berk, Sorenson & Barnes 2016).

The present study tests the following three hypotheses regarding the relationship between included variables and serious misconduct:

- H1: The receipt of awards or complimentary remarks by officers will be associated with a lower likelihood of serious misconduct; however, the effect will decay as the number of awards increases.

- H2: Officers will initially respond positively to management action in response to substantiated complaints but, like positive feedback, this effect will diminish over time (if for no other reason than it indicates a higher number of substantiated complaints);

- H3: Fewer transfers will result in an increased likelihood of serious misconduct; however, a higher number of transfers will also coincide with a high likelihood of misconduct.

The variables examined, listed in Table 1, were included because of their association with serious misconduct. They are also widely accepted features of effective misconduct prevention. It is well established that recognition is a powerful tool to support positive performance (Luthans 2000). Police tenure (ie a low rate of transfers) may be associated with an increased likelihood of misconduct events (Alston 2010), because it indicates long-term exposure to high-risk positions (Wood 1997a), but also because of disaffection due to lack of opportunities for new roles or career progression. The ability of agencies to implement timely remedial mechanisms in response to misconduct is pivotal (Guffey & Helms 2001).

Cubitt, Wooden and Roberts (2020) identified a number of important predictors of serious misconduct, including the number of complaints received and secondary employment. The random forest model from this earlier study is reported in Table 1. Predictors of serious misconduct are ranked according to their relative importance in the model. This research used a receiver operating characteristic curve to assess model validity, identifying that the model successfully predicted 94 percent of serious misconduct among police (AUROC=0.94) (Cubitt, Wooden & Roberts 2020). The AUROC, which we refer to in simple terms as the predictive accuracy of the model, represents the probability that a randomly selected case will be accurately classified.

Table 1: Variable importance produced by random forest model trained on findings of serious misconduct	
Variable	**Mean decrease Gini coefficient**
Demographic variables	
Secondary employment	0.139
Awards or complimentary remarks	0.126
Age	0.061
Length of service	0.055
Socio-economic status	0.039
Years at rank	0.036
Transfers	0.031
Duty type: General duties	0.008
Rank: Senior Constable	0.006
Misconduct process variables	
Unsubstantiated complaints	0.066
Local Area Commander Warning Notice	0.059
Region Commander Warning Notice	0.054
Performance or conduct management plan	0.024
Management action	0.023
Prior minor misconduct	
Issues with an investigation	0.031
Improper use of force	0.022
Drink driving	0.020
Complaint related to court	0.018
Breach code of conduct	0.017
Harassment, intimidation or bullying	0.015
Allegation of corruption	0.014
Positive drug test	0.010
Disobey reasonable direction	0.010
Firearm related complaint	0.009
Untruthfulness/Dishonesty	0.009
Rudeness to members of the public	0.009
Breach privacy, unauthorised disclosure of data	0.008
Property or exhibits complaint	0.007

Note: The larger the mean decrease Gini coefficient, the stronger the association of that variable with serious misconduct

Source: Cubitt, Wooden & Roberts 2020

The aim of the present study was to examine factors that protect against serious misconduct in more detail, using PDPs. PDPs provide the contribution of the variable to the probability of classification to the dependent variable (ie serious misconduct) at different points within the range of that variable. This value is relative to the mean decrease Gini coefficient produced by the random forest model, controlling for the influence of other variables, and is represented on the y-axis of PDPs.

Results

Awards or complimentary remarks

The awards and complimentary remarks variable was shown to have a strong protective relationship with serious misconduct. This includes the formal acknowledgement of positive workplace behaviours though provision of awards such as ethical service medals, and complimentary remarks attached to an officer's employment record. It is intuitive that awards and compliments may prevent serious misconduct; supporting positive behaviour is unlikely to increase the risk of misconduct. However, the effect on misconduct risk was only observed after three instances of behavioural support, after which the PDP indicates that the risk of misconduct decreased with each additional award and complimentary remark (Figure 1). Reward or recognition for positive behaviours by officers is likely to support such behaviours—with little evidence of diminishing returns—and mitigate the likelihood of serious misconduct.

Figure 1: Number of awards or complimentary remarks and risk of serious misconduct
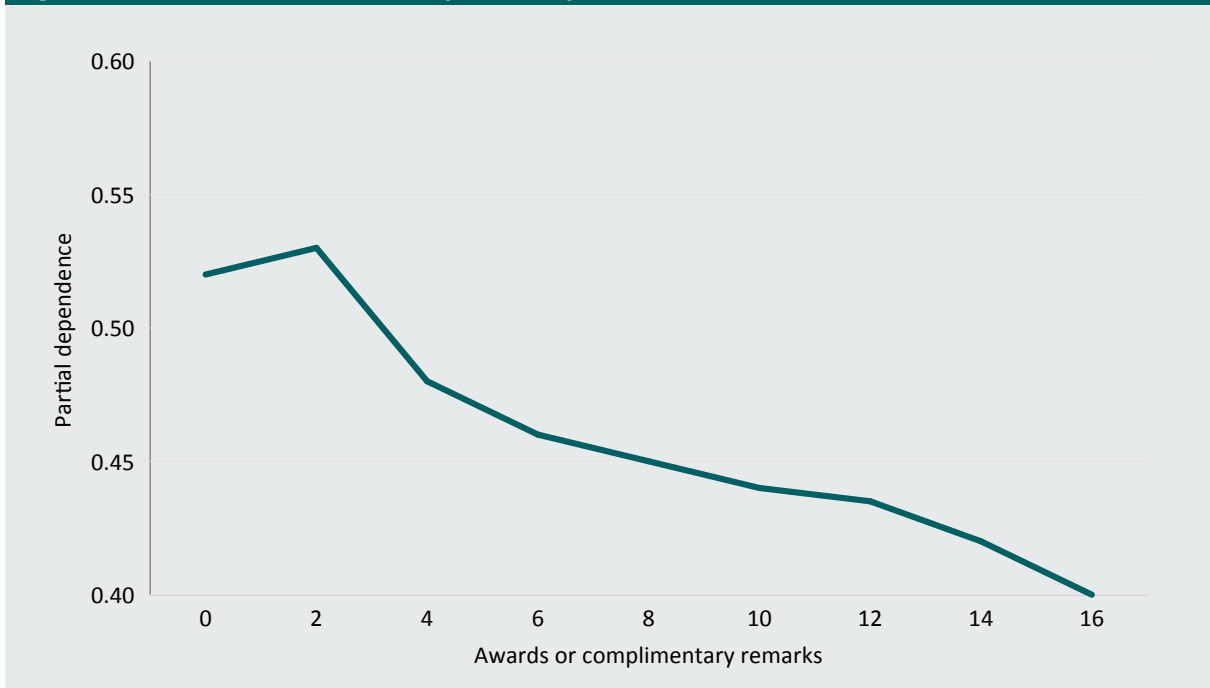
Source: NSWPF C@ts.i complaint management database 2018

Management action resulting from substantiated complaints

Management action refers to instances of remediation following a substantiated complaint for any misconduct, as defined under schedule 1 of the *Police Act 1990* (NSW). Management action was delivered by superior officers, including the subject officer's commander. This is important, as it reflects the fact that misconduct was investigated, managed and remediated locally to the subject officer. The PDP for management action indicated that a preventative effect was present for up to four instances of management action; however, once this was exceeded, the likelihood of serious misconduct increased (Figure 2). It may be that this coincides with a higher prevalence of misconduct generally, rather than management action exacerbating poor conduct.

**Figure 2: Instances of management action and risk of serious misconduct**

Source: NSWPF C@ts.i complaint management database 2018

Transfers

Finally, the role of transfers was examined. It is generally accepted within policing that transfers are an important corruption prevention strategy as they minimise long-term exposure to high-risk positions (Wood 1997a). However, a low rate of transfers may also lead to officers becoming disaffected because of a lack of opportunities for new roles or career progression. While there was an overall positive relationship between transfer numbers and serious misconduct, the PDP demonstrated that this effect was nonlinear (Figure 3). Officers with up to five transfers during their career were at a higher risk of serious misconduct than those who transferred more frequently, controlling for length of service, although the effect size was very small. Officers with more than five transfers were less likely to commit an instance of serious misconduct, relative to those who had stayed in the same workplace a long period of time. However, when compared with other variables considered here, the size of this effect was small, with a change of only 0.03, suggesting that overall the effect of transfers was negligible.

Figure 3: Number of transfers and risk of serious misconduct
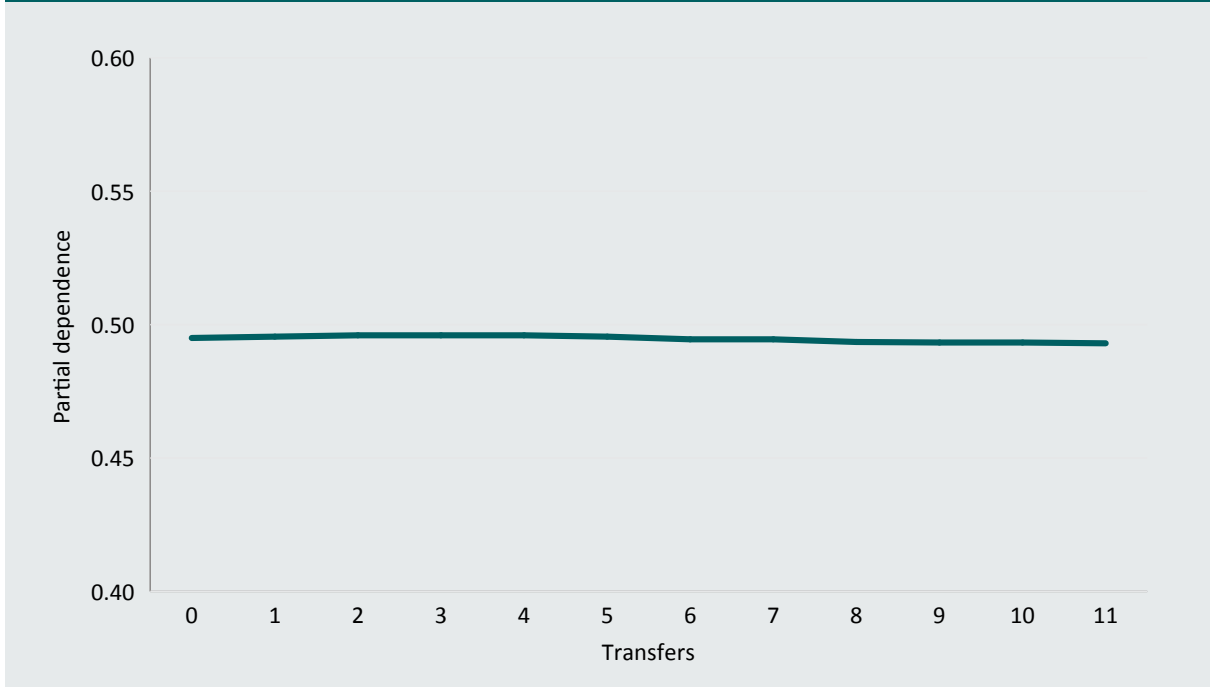
Source: NSWPF C@ts.i complaint management database 2018

Discussion

There has been limited empirical research exploring risk factors for serious misconduct among police, particularly in Australia. Where this literature is available, it does little to interrogate factors which may be used to prevent misconduct. The general lack of application of analytical methods was criticised as far back as the Wood Royal Commission into the New South Wales Police Service (Wood 1997b), with more recent literature supporting this assertion (Chan & Dixon 2007; Hay Group 2000). This study used an analytical method with limited prior use in the subject area of policing, although it must be noted that it has been used in other areas of criminal justice research (Grogger et al. 2021). This method was applied here to provide insight into police misconduct and to explore factors which may be used by police management to prevent misconduct.

Awards or complimentary remarks

The receipt of awards or complimentary remarks had a strong relationship with a reduced risk of serious misconduct. Beyond a small number of instances of behavioural support, the risk of serious misconduct declined as the number of awards and complimentary remarks increased, with little evidence of decay over time. This is important, given corruption prevention typically focuses on identifying and avoiding risks rather than supporting positive behaviour. This result may be interpreted in two ways. First, it may represent strong performance, as high-performing officers—less prone to instances of misconduct—may accrue a greater number of awards or complimentary remarks. Alternatively, officers who were recognised for positive behaviour or performance may be less likely to engage in misconduct.

There is support for the latter conclusion in the human resources literature. Recognition is a powerful factor in supporting and motivating positive performance (Luthans 2000). However, it is clear that more traditional approaches such as monetary rewards are not sufficient recognition to provide a workplace benefit (O'Neal 1992). Recognition (Benrazavi & Silong 2013) and employee motivation (Verma & Verma 2012) were more important than monetary rewards to employee satisfaction. Employees who are satisfied demonstrate notably higher productivity and performance (Becchetti, Castriota & Tortia 2013).

That this variable has been found to prevent misconduct is significant in the area of policing; however, it is not entirely unheralded (Cornelius 2016). But rewards must be provided in a fair and equitable manner. Currently, the NSW Police Medal is issued to officers after 10 years of diligent and ethical service, a benchmark met through review of the service and complaint history of an officer (NSW Police Force 2020). After this initial period, a clasp is awarded for each additional five-year period in which this benchmark is upheld. Given the strength of the relationship between awards and complimentary remarks and serious misconduct—specifically, the notably diminished misconduct risk associated with positive behavioural support—employee recognition may be a strong misconduct prevention tool.

Management action resulting from substantiated complaints

The findings with respect to management action resulting from substantiated complaints relate to activity that occurs at a local command level. Locally managed investigations may result in a finding that the complaint was unsubstantiated or, if the complaint was substantiated, some form of management action. Obviously, this does not apply to serious instances of misconduct, which are necessarily referred to the Professional Standards Command, an external command with staff specifically skilled to manage internal investigations.

Management action resulting from substantiated complaints was associated with a lower likelihood of serious misconduct. The benefit of locally managed investigations for less serious complaints is that they are likely to be handled more quickly than if all complaints were referred to the Internal Review Panel (or a similar entity). While the outcome is typically similar—counselling or remedial performance management—the process of consideration by the Internal Review Panel of the NSW Police Force takes considerably longer and is more intensive than resolution at the command level (NSW Police Force 2012). The issue of timeliness in police complaints processes has been identified in both parliamentary reviews (Tink 2015) and research (Corbo Crehan & Goodman-Delahunty 2019; Galovic et al. 2016). In Australia, the *Review of police oversight* (Tink 2015) explicitly noted the importance of policing agencies managing, resolving and reporting on complaints in a timely manner. This was confirmed in the NSW Department of Justice's (2015) response to the Tink review.

However, it was also observed that the relationship between management action and risk of misconduct is not linear. As instances of management action were accrued, up to four management actions appeared to reduce the association with serious misconduct; conversely, once four actions were exceeded, officers were increasingly likely to engage in serious misconduct. This suggests that officers with a higher rate of substantiated complaints are at an elevated risk of serious misconduct (Cubitt, Wooden & Roberts 2020). At this point, management action at the local command level becomes less effective in preventing further misconduct, and may no longer be viewed as an appropriate response.

Alternatively, this result could suggest that, beyond four instances of management action, an officer may be sufficiently prone to misconduct that remediation is no longer an option. After four instances of minor misconduct, the likelihood of serious misconduct increases. It may be beneficial for policing agencies to view this as a red flag indicating misconduct propensity, at which point an officer should be considered an organisational risk. It may then be a better course of action to either transfer the officer to low-risk duties or remove them from the agency, should their behaviour persist.

Overall, effectively implemented informal management action may help prevent serious misconduct. However, unlike the formal awards process described above, there are no clear benchmarks for management action. Management action in response to minor instances of misconduct was relatively ad-hoc.

There may be substantial financial benefit to agencies in using informal management action processes, rather than initiating a more resource intensive remedial process such as a decentralised investigation and remediation. However, the finding of a nonlinear relationship highlights the limits of this approach, and the need for alternative mechanisms when there are repeated instances of less serious misconduct. Further, consideration should be given to improving consistency through benchmarking of action taken in response to different types of minor misconduct.

Transfers

Finally, in addressing a longstanding notion that infrequent transfers were a risk factor for serious misconduct, this study found that officers who remained in the same workplace for a lengthy period of time were at a very marginally higher risk of serious misconduct. The risk of misconduct fell after an officer had been transferred more than five times throughout their career. However, the effect size suggested that, overall, the impact of transfers was negligible.

The number of times an officer transfers during their career, typically referred to as police tenure, has traditionally been a point of contention. Opportunities to undertake professional development and to move workplaces are important in policing environments. Further, the consequences of prolonged exposure to traumatic stimulus and high-risk positions make tenure an important aspect to consider. Underpinning this is fairness and transparency, and the need to offer sufficient development opportunity through the ability to transfer and explore other policing duties (Chappell & Piquero 2004; Porter & Prenzler 2012).

The idea that the longer an officer spends in a role, the greater the risk of misconduct is not new (Alston 2010). This was identified as a particular issue during the Royal Commission into the NSW Police Service, which highlighted how senior officers were able to exert influence over the transfer and promotion of junior officers to desirable and less desirable commands (Wood 1997a). The royal commission considered long tenure to be a misconduct risk, particularly among officers working in general duties roles, and officers in drug law enforcement, gaming and other areas associated with high risk of misconduct (Wood 1997b).

While the royal commission formed the opinion that there were direct links between tenure and misconduct, academic literature has taken a less direct view regarding causation. Length of tenure at an individual workplace has been linked to burnout and stress (Vuorensyrjä & Mälkiä 2011), and stress is an important factor contributing to police misconduct (Cubitt & Judges 2018). Other factors include prolonged exposure to temptation, the potential for deviant subcultures to form, low managerial oversight, and dissatisfaction with career progression (Newburn 1999; Porter & Prenzler 2012).

The findings of this study lend marginal support to the recommendations of the Wood royal commission (Wood 1997a). However, given the effect size here, this measure alone cannot be expected to substantially affect serious misconduct. Rather, it should be considered a measure to supplement process improvements, such as those noted among other variables considered here.

Benefits of novel analytical methods

The findings from this study also demonstrate the importance of novel research methods. While traditional methods of analysing relationships between risk factors and outcomes such as serious misconduct can identify the significance and strength of the relationship, the random forest offers a robust alternative. Emerging literature particularly suggests that these methods offer greater predictive accuracy than methods such as logistic regression for complex and naturally occurring datasets such as those found in criminal justice fields (Couronné, Probst & Boulesteix 2018). However, on their own, neither of these methods would have been sensitive enough to reveal the effect of management action or transfers observed using PDPs.

The ability to identify where an effect peaks and troughs for predictors of misconduct is important in an applied setting. For example, the analysis in this paper highlights the limited rather than universal impact of management action on the risk of misconduct. Evidently there is substantial utility in implementing novel methods when interrogating, in this instance, naturally occurring data (Lester, Muskett & O'Reilly 2017). However, it must be noted that the findings here are subject to the same caveat that applies to most police misconduct analyses—potential under-reporting (Goodman-Delahunty, Beckley & Martin 2014). While the analytics used here provide notable insights, they must be viewed in the context of low reporting rates and the barriers associated with reporting police misconduct.

Conclusion

The findings of this study highlight the effectiveness of certain management strategies in preventing serious police misconduct. This research has shown that, within the policing environment, there are a range of mechanisms that may be used to prevent misconduct and identify officers who may be at risk. The capacity of policing agencies to reduce risk and prevent misconduct is important in improving police legitimacy and, more broadly, community perceptions of law enforcement.

Acknowledgements

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URLs correct as at May 2021

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