NSW
Police Integrity
Commission

Research
and Issues
Papers

NUMBER 03

OCTOBER 2009

Police Integrity Commission
Level 3, 111 Elizabeth Street
Sydney NSW 2000

www.pic.nsw.gov.au

Project Marrella: Is misconduct by NSW police officers affected by the number of students in a training intake at the NSW Police College?

Julie People

Summary

The number of students being trained at police colleges and academies can vary greatly and occasionally, very large numbers of students are recruited and trained. A perception exists that when larger than usual numbers of students are recruited and then trained at police colleges and academies, the students trained in these large intakes are more likely to engage in misconduct once they become police officers than those trained in smaller intakes. This project, codenamed Project Marrella, tested the validity of this perception for NSW police officers using complaints as a proxy for misconduct. The results showed that students trained in large intakes were not more likely to be the subject of complaints in their first two years of service than students trained in smaller intakes. The perception that students trained in large intakes are more likely to engage in misconduct once they become police officers than those trained in smaller intakes is therefore not valid for NSW police officers when complaints are used as a proxy for misconduct.

Introduction

The recruitment processes of many police forces around the world typically require that applicants satisfy a range of selection criteria and pass a number of tests, such as fitness, literacy and psychological tests (e.g. Walker, 1986; Cochrane, Tett & Vandecreek, 2003; Detrick, Chibnall & Luebbert, 2004; Lough & Ryan, 2005). This process is then generally followed by training at specialised academies or colleges where the theoretical knowledge and practical skills required to become a police officer are taught and further developed.

The recruitment process of the New South Wales (NSW) Police Force is made up of several stages that applicants must pass. Applicants must be of a minimum age, possess a driver's licence and fulfil certain academic criteria, such as completing the Higher School Certificate. Applicants are also assessed on professional suitability criteria, including their criminal history, traffic and driving history, employment history, literacy and typing ability. In addition, applicants' medical histories are considered and they must pass a physical fitness test and a psychometric test, which is used to assess an applicant's personality and aptitude.

Once an applicant has satisfactorily fulfilled the relevant criteria, their application is considered on a competitive basis for offer to the next available training course. Both academic and professional suitability rankings are considered when identifying suitable applicants. Offers are then made to the selected applicants inviting them to enrol in the training course at the NSW Police College.

Training at the NSW Police College typically involves five sessions and includes subjects based on the criminal justice system, safety and various other aspects of policing, including ethics in policing. Students have the option of completing the first session either part-time by distance-education, or full-time at the College. All students must complete the second session full-time at the College. Once the requirements for the second training session have been completed, students are attested and can then be employed by the NSW Police Force. Sessions three, four and five are studied by distance-education while employed full-time by the NSW Police Force as probationary constables for a minimum period of 12 months. During this time, probationary constables are supervised by higher ranking police officers and gain additional practical experience. This practical experience continues after the probationary period because all police officers are required to undertake general duties for their first three years of service.

Three separate groups, or intakes, of students are trained each year at the NSW Police College and the number of students in each intake may vary greatly. For example, between the years 2000 and 2007, the number of students attested after attending session two at the College ranged from 111 to 801. The vast majority of intakes attested contained less than 400 students (See Methods section for details; NSW Police College, unpublished data).

Variations in the number of students being recruited, trained and attested at the College can occur when the organisational needs of the NSW Police Force change. From time to time, large numbers of applicants are recruited to deal with the demand to train more police officers and increase the number of officers in the NSW Police Force (Chan & Dixon, 2007). This practice is also common among other police forces around the world (e.g. Sechrest & Burns,1992; Fyfe & Kane, 2006) and can result in larger than usual numbers of students being trained at police colleges and academies.

Several studies (e.g. Sechrest & Burns,1992; Sanders, 2003; Fyfe & Kane, 2006; Chan & Dixon, 2007) have suggested that when the number of students being trained at a police college or academy is larger than usual:

- the recruitment processes are relaxed or are less competitive;
- academies and colleges suffer from a lack of resources; and
- training methods are less comprehensive or attentive than intakes with smaller numbers of students.

In addition, Chan and Dixon (2007) also suggested that some parts of the training, in particular training in ethics, are less thorough when large numbers of students are trained compared with smaller numbers of students.

The above suggestions have led to a widespread perception among academics, police officers and other relevant stakeholders that when larger than usual numbers of students are trained at police colleges and academies, the students trained in these large intakes are more likely to engage in misconduct once they become police officers than those trained in smaller intakes (Sechrest & Burns, 1992; Sanders, 2003; Fyfe & Kane, 2006; Chan & Dixon, 2007).

A notable example which supports this perception occurred in Miami in the 1980s. This example is described briefly.[1] In 1980, crime rates in Miami were growing and, at the same time, the number of police officers in the Miami Police Department was falling because officers were resigning from the Department. The Miami Police Department began recruiting heavily. It changed its hiring policies and relaxed its recruitment procedures. Training courses were run more frequently to deal with the demand to train a large number of officers. As a result of changes in training and recruitment, the hiring process took half the time that it had previously. The proportion of experienced staff to new staff was much lower than it had been in the past because large numbers of experienced officers had resigned and large numbers of new officers were employed. This created the potential for poor supervision of new officers once they began their duties. Several years later, and after a number of scandals, one hundred police officers were identified as being involved in unacceptable behaviour or serious criminal activity. Three-quarters of these officers were employed during the recruitment drive of the early 1980s. Any number of factors could have influenced the behaviour of the officers, such as community problems and high crime rates, but it is possible that the unacceptable behaviour and serious criminal activity that occurred was a product of differences in recruitment, training and/or supervision (Sechrest & Burns, 1992).

The perception that students trained in large intakes are more likely to engage in misconduct once they become police officers than those trained in smaller intakes is also present in NSW. Chan and Dixon (2007) spoke with 11 key informants from the NSW Police Force and other agencies within NSW. Comments were made by two police officers and one informant from another agency that when larger than usual numbers of police officers are recruited and trained, there are concerns about the quality of applicants accepted, resources at the NSW Police College and support for new officers. One informant commented that the ethics courses were removed from the training when large numbers of students were at the College. Suggestions were also made that for police officers recruited and trained in large intakes, problems with corruption and misconduct occurred three to five years after training.

[1] For further detail see Sechrest and Burns (1992).

The broad objective of this project, codenamed Project Marrella, is to test the validity of the perception that police officers trained in large intakes are more likely to engage in misconduct than police officers trained in smaller intakes. Testing the validity of this perception is challenging because misconduct is often a secretive activity, and therefore, very difficult to measure. Complaints about police officers can, however, be used as an indicator of misconduct.

Complaints against police officers as an indicator of misconduct

When using complaints as an indicator of misconduct it is important to consider a number of points. Firstly, not all instances of misconduct will lead to a complaint, especially in the cases where persons are in agreement to conduct misconduct or corrupt activities (Criminal Justice Commission, 1997). Complaints are more likely to be made when there is a victim involved who has been affected by the misconduct. In addition, the number of complaints made about police officers can vary over time due to reasons independent of the level of police misconduct, such as changes in public willingness to complain or changes in the amount of contact between police officers and the public (Criminal Justice Commission, 1997). Also, it is possible that when a complaint is made, it is declined or not investigated because details are not provided; the event described in the complaint was too long ago to hold a useful investigation; or the complaint is deemed false or vexatious (*Police Act 1990 (NSW)*). For the reasons described above (except for false or vexatious complaints which are not usually received in large numbers), the number of complaints made and investigated about police officers is likely an underestimate of the true incidence of police misconduct.

It is also important to consider that complaints are allegations of misconduct. A police officer who is the subject of a complaint has not necessarily engaged in misconduct. A complaint is deemed to be 'sustained' if, during its investigation, there is evidence of misconduct. A complaint is deemed to be 'not sustained' if there is evidence that misconduct did not occur or if there is not sufficient evidence that misconduct did occur. Many complaints are difficult to investigate and sustain because of a lack of evidence (e.g. Goldsmith, 1991; Prenzler, 2004). In some jurisdictions, sustained complaints comprise 10 per cent or less of all complaints recorded (Goldsmith, 1996; Criminal Justice Commission, 1997), although Griswold (1994) reported an unusually high rate of 49 per cent. When using complaints data as an indicator of misconduct, it is important to consider whether all complaints (sustained and not sustained) should be included in the data. Excluding complaints that are not sustained and including only the sustained complaints ensures that only incidents involving misconduct are considered. This, however, is likely to further underestimate the incidence of misconduct by police officers.

Other aspects of complaints data also require consideration, such as the types of misconduct described in the complaints made against police officers. Some complaints are concerned with relatively minor types of misconduct, such as inadequate customer service, breach of dress code or administrative issues. Other types of complaints are concerned with more serious types of misconduct, such as unauthorised disclosure of information, improper associations, dishonesty, unreasonable use of force, drink driving offences, fabrication of evidence, wrongful seizure of property after a search, making false accusations and tampering with or destroying evidence. When using complaints data to study misconduct, it is important to select the types of complaints that are appropriate for the aims of the study.

Despite the problems with complaints data, using information from complaints about police officers is currently one of the best methods of collecting data about misconduct. The validity of the perception that police officers trained in large intakes are more likely to engage in misconduct than police officers trained in smaller intakes was therefore tested in Project Marrella using complaints about police officers as an indicator of misconduct.

Factors influencing complaints against police officers

A number of factors unrelated to recruitment and training may be associated with the behaviour of police officers and/or their likelihood of being the subject of a complaint (see Riksheim & Chermak, 1993 for an overview). These range from individual characteristics of the officer, such as gender, age or experience, to organisational characteristics including workplace culture or size of department and characteristics of the community that police officers serve, such as population or crime rate. A considerable amount of research exists on such issues and shows mixed results, with some studies showing there are effects of a particular factor and others showing there are no effects (some examples are provided below). Variation among the results of different studies can occur for many reasons. Data can be collected or analysed differently, different types of data can be used and different jurisdictions can be studied (e.g. Kutnjak Ivcović, 2005).

Some studies have shown that the gender of a police officer may be associated with their behaviour or likelihood of engaging in misconduct. For example, studies using complaints data have found that male police officers are more likely to attract complaints against them than female police officers (e.g. Alley, Waugh & Ede,1996; Brandl, Stroshine & Frank, 2001; Fyfe & Kane, 2006). Also, McElvain and Kposowa (2008) found that male officers were more likely to be involved in shooting incidents than female officers. In contrast, observational studies have found that male officers were not more likely to be involved in an incident involving verbal or physical force than female officers (Terrill & Mastrofski, 2002; Paoline & Terrill, 2007).

The age of an officer is also likely to be associated with their behaviour. For example, complaints about excessive use of force were more commonly made about younger police officers than older police officers (Brandl et al., 2001). Also, the risk of an officer being involved in a shooting was lower as an officer aged (McElvain & Kposowa, 2008).

Other factors that could also be important in the behaviour of police officers include their race, levels of education or experience (e.g. Terrill & Mastrofski, 2002; Paoline & Terrill, 2007, Kappeler, Sapp & Carter, 1992). For example, incidents involving police officers with higher levels of education resulted in less verbal and physical force than officers with less education (Paoline & Terrill, 2007) and police officers with higher levels of education received a smaller number of sustained complaints than those with lower levels of education (Kappeler et al., 1992). In contrast, a police officer's level of education has not been found to be related to the likelihood of attracting a complaint regarding excessive use of force (Brandl et al., 2001).

Recent research has suggested that the incidence of complaints is related to the types of duties a police officer performs, with police officers involved in traffic duties, general duties and other duties attracting different numbers of complaints (Ede, Homel & Prenzler, 2002). In addition, other studies have suggested that police officers who make more arrests or are more productive or proactive are more likely to attract a complaint against them than officers who make fewer arrests (Brandl et al., 2001; Lersch & Mieczkowski, 1996; Terrill & McCluskey, 2002). In contrast, analyses of arrests at the department level showed no significant relationship between numbers of arrests and complaints (Cao & Huang, 2000).

Factors regarding the community that police officers serve (such as crime rate or population) may also be associated with the behaviour of police officers. Mixed results have been found regarding the relationship between crime rate and the behaviour of police officers (see Riksheim & Chermack, 1993 for a summary). Analysis of data at the organisational level has shown that larger populations are associated with larger complaint rates (Cao & Huang, 2000). Organisational and situational factors may also influence the behaviour of police officers. Recent work has suggested that the size of the station in which a police officer works, measured by the number of officers, may also influence complaints (Ede et al., 2002).

In summary, the extant research literature demonstrates that a wide variety of factors, other than the size of the intake in which a police officer was trained, may affect a police officer's behaviour and their likelihood of engaging in misconduct or being the subject of a complaint. Such factors were therefore considered in Project Marrella in order to determine whether these factors could potentially confound any relationship between the sizes of intakes in which police officers are trained at the NSW Police College and misconduct by police officers.

Aim of Project Marrella

Project Marrella was undertaken in accordance with one of the principal functions of the Police Integrity Commission (PIC): to prevent police misconduct (*Police Integrity Commission Act 1996*). One specific aim of Project Marrella was to test the validity of the perception that police officers trained in large intakes are more likely to engage in misconduct than police officers trained in smaller intakes by examining whether the probability of a police officer being the subject of a complaint about any type of misconduct is related to the number of students in their intake at the NSW Police College, once other factors likely to affect complaints have been taken into account.

As mentioned previously, ethics in policing and ethical decision-making are issues taught at the NSW Police College and are thought by some (see Chan and Dixon, 2007) to be excluded from the curriculum when large intakes are being trained. Project Marrella therefore also specifically aimed to determine whether the probability of a police officer being the subject of a complaint about a type of misconduct that was likely to involve an ethical issue is related to the number of students in their intake at the NSW Police College, once other factors likely to affect complaints have been taken into account. This specific aim was of particular importance to the PIC because complaints about types of misconduct that are likely to involve ethical issues generally encompass complaints about more serious misconduct and the PIC is primarily concerned with the prevention of serious misconduct in the NSW Police Force.

Although the perception regarding the sizes of intakes and misconduct is widely held (e.g. Sechrest & Burns, 1992; Sanders, 2003; Fyfe & Kane, 2006; Chan & Dixon, 2007), to date, no published studies have tested it using empirical data. Conducting Project Marrella was therefore important to determine the validity of the perception and if it is true, to subsequently determine how recruitment and training of police officers in NSW could be modified to reduce or prevent misconduct. Further research regarding the quality of the recruitment and training processes would, however, be needed to determine exactly how the recruitment and/or training processes could be modified. This study aimed to test the validity of the above perception only and made no attempt to describe or determine the quality of the recruitment process or of the training at the NSW Police College when larger than usual intakes are trained.

Methods

Data

NSW police officers who were attested from the NSW Police College from December 2001 until February 2007 were considered in this study[2]. Complaints data were used as a proxy for misconduct and were retrieved from the NSW Police Force's electronic records.[3] The data included information regarding a number of details about police officers who are the subject of complaints, the nature of the alleged misconduct, the date of any alleged incident and the type of management action taken against the officer, if any. Data regarding personal characteristics of police officers, their work history and characteristics of local area commands (such as area, population, numbers of callouts or incidents) were also retrieved from the NSW Police Force's electronic records[4] or directly from the NSW Police Force. This data was used to calculate variables that may influence complaints, other than the number of students in an intake.

It was important to select complaints that were appropriate for the aims of the study. Because Project Marrella was concerned with testing misconduct in police officers, not just allegations of misconduct, it was necessary to include cases where misconduct had been shown to occur. Data regarding whether or not a complaint was sustained was not available. Management action is generally taken against police officers when misconduct has occurred and when complaints are sustained.[5] Including only complaints that result in management action against the subject officer is therefore an alternative method to using sustained complaints of including incidents involving misconduct and excluding incidents where misconduct did not occur. Hence the only complaints included in the data were those where management action had been taken against the officer who was the subject of the complaint. All types of management action were included, such as counselling, mentoring, reduction in rank, retraining and being given a warning.

The period of time in which to examine complaints made against police officers also required consideration. For Project Marrella, it was necessary to:

- ensure the time period sampled was near to the training provided to police officers at the NSW Police College so that the actions of police officers were more likely to be influenced by their training at the College;
- minimise the number of factors (which may affect complaints against a police officer) to consider other than size of the intake in which an officer was trained;

[2] Data were not available electronically for intakes attested before December 2001. Intakes attested after February 2007 could not be included because two years of complaints data were not available.
[3] Updated as of 17 March 2009.
[4] Updated as of 17 March 2009.
[5] It is possible for complaints that are not sustained to result in management action and it is possible for complaints that are sustained to result in no management action, but these cases are uncommon.

- allow enough time for police officers to have an opportunity to incur complaints against them; and
- allow enough time for complaints about police officers to be investigated and finalised.[6]

Complaints within a police officer's first two years of service were therefore examined. This ensured that:

- police officers were sampled within a relatively short time of their training at the NSW Police College and during some of the time in which they continued with their training by distance-education;
- several factors which may affect complaints against police officers did not need to be considered, including rank and type of duties because the police officers were all probationary constables for at least 12 months and constables for the remainder of the period and were all assigned general duties for the entire two years; and
- the time period was sufficient for complaints to be made against police officers, investigated and finalised.

NSW police officers begin service as probationary constables immediately after they are attested from the NSW Police College. Two years service was therefore measured as two years from a police officer's date of attestation. In order to determine whether an officer was the subject of a complaint regarding an incident that occurred within their first two years of service, it was necessary to know the date of the alleged incident. This date was available for the majority of complaints, but was missing for some complaints. In these cases, the incident date was replaced by the date in which the complaint investigation was initiated, which represents a date after the incident date. It is therefore possible that some complaints that occurred within the time period selected for each analysis were not included in the data, particularly if the date the complaint investigation was initiated was long after the incident date.

Complaints that did not include the name of a police officer were excluded from the data. Police officers who resigned or were terminated within two years from their date of attestation were also excluded from the data because these officers did not have the entire two year period to incur complaints against them. Preliminary analysis of the data showed that less than two per cent of police officers were terminated involuntarily within two years from their date of attestation and there was no pattern with the number of officers terminated and the number of students in an intake.

[6] Once received, a decision must be made whether or not to investigate a complaint. If the complaint will be investigated, it must be allocated to a police officer for investigation. This can take up to five weeks from the date a complaint is received, but in some circumstances can be more. The NSW Police Force recommend that investigating and finalising a complaint occur within 12 weeks of the complaint being allocated to the officer in charge of the investigation.

In summary, the only complaints considered in Project Marrella were those that resulted in management action against the police officer who was the subject of the complaint and described incidents which occurred within a police officer's first two years of service.

Complaints variables

It was necessary to create two distinct kinds of complaints variables because Project Marrella aimed to determine whether the size of the intake in which a police officer was trained affected the probability of the officer being the subject of:

- a complaint about any type of misconduct; and
- a complaint about types of misconduct likely to involve ethical issues.

The first kind of complaints variable was therefore concerned with complaints about incidents involving any type of misconduct. All complaints were included for this kind of complaints variable. The second kind of complaints variable was concerned only with complaints about types of misconduct concerning issues of an ethical nature. For this kind of complaints variable, relatively minor types of misconduct, such as inadequate customer service, breach of dress code or administrative issues were not included in the data. In general, these types of misconduct do not describe issues that occur because of unethical behaviour or because unethical decisions are made. Such issues are more likely to occur for reasons including accidents, moments of frustration, loss of concentration or misunderstandings. More serious types of misconduct were included in the data. These issues included unauthorised disclosure of information, improper associations, dishonesty, unreasonable use of force, drink driving offences, fabrication of evidence, wrongful seizure of property after a search, making false accusations and tampering with or destroying evidence. Although some of these more serious types of misconduct can occur unintentionally, they can also occur because of deliberate unethical behaviour or because an unethical decision is made. These more serious types of misconduct therefore generally describe issues that are more likely to be of an ethical nature.

Initial examination of the data showed that in their first two years of service, the vast majority of police officers who were the subject of a complaint either about any type of misconduct or about types of misconduct that were likely to involve ethical issues (and subsequently resulted in management action) had only one complaint against them (see Results section of this paper). Two separate sets of analyses were done for each kind of complaints variable (complaints about any type of misconduct and complaints about types of misconduct that were likely to involve ethical issues).

One set of analyses was done to examine police officers who were the subject of one or more complaints compared to those who had no complaints made against them. A binary coded variable was created for police officers who were the subject of one or more complaints (1 = police officer was the subject of one or more relevant complaints within their first two years of service; 0 = no complaints).

A separate set of analyses were done to examine police officers who may have had recurring problems with misconduct or behaviour compared to those who may not have had such problems. For these analyses, a binary coded variable was created for police officers who were the subject of two or more complaints (1 = police officer was the subject of two or more relevant complaints within their first two years of service; 0 = less than two complaints).

In summary, four different binary coded complaints variables were used:

- One or more complaints about any type of misconduct;
- Two or more complaints about any type of misconduct;
- One or more complaints about types of misconduct that were likely to involve ethical issues; and
- Two or more complaints about types of misconduct that were likely to involve ethical issues

Other relevant variables

The main variable of interest was the number of students in each intake at the NSW Police College. Note that for the purposes of this study, intakes at the NSW Police College represent a group of students who are accepted into a training course and trained during the same period of time. These students are not necessarily trained in the same room or by the same person. The number of students attested per intake was used as a proxy for the number of students per intake. Each intake contained a greater number of students than that attested because some students drop out or repeat subjects from each intake. The number of students attested therefore represents the minimum number of students in each intake. Values within the intake variable were categorised into four groups: less than 299 students, 300 to 399 students, 400 to 499 students and 500 or more students. For the purposes of this study, intakes with more than 400 students are considered to be larger than the usual intakes at the NSW Police College. The breakdown of intakes in each group is presented in Table 1. The mean ($\pm$ standard error) percentage of students who dropped out from each class (leaving the number of students attested) was similar for each group (less than 299 students, 17.1 $\pm$ 4.3; 300 to 399 students, 23.3 $\pm$ 4.7; 400 to 499 students, 18.7 $\pm$ 6.7; and 500 or more students, 18.1 $\pm$ 5.8).

Table 1. Group membership for number of students attested in each intake.

	Group			
	Less than 299	300 - 399	400 - 499	500 or more
Number of students attested in each intake	111	302	412	547
	117	316	423	687
	141	317		801
	153	323		
	157	324		
	170	325		

The additional variables that were considered for analyses were those that have most consistently been found to influence the occurrence of complaints or behaviour of police officers in previous studies or have received the greatest amount of theoretical interest. Some variables, such as previous levels of education, could not be considered because data was not available. Some variables did not need to be considered because they were equal for all officers in the analyses; for example, types of duties, rank and length of service or experience. A number of other variables were initially considered to allow for any differences that might occur among LACs.[7] These were calculated for the first LAC an officer was sent to and for each officer were specific to the calendar year the officer started at that LAC.[8] These variables included the number of authorised officers at the police officer's first LAC, the number of incidents of crime recorded at the police officer's first LAC, the number of callouts recorded at the police officer's first LAC, the civilian population at the police officer's first LAC, the number of stations at the police officer's first LAC, the area of the police officer's first LAC and various combinations of these (e.g. number of callouts per authorised officer).

The area of the police officer's first LAC (called *Area of LAC*) was the only one of these variables included in the analyses. The other variables were not included in the multivariate analyses either because bivariate analyses showed that they were not related to complaints or because of problems with multicollinearity[9]. *Area of LAC* was used because it was related to the occurrence of complaints in the bivariate tests (see below) and in testing for multicollinearity it was found to be closely related to many of the other variables pertaining to LACs. It was therefore used as a proxy for a number of differences among LACs. For example, LACs that are greatest in area are generally rural and have a greater number of police stations than smaller LACs. LACs with greater area are also most likely to have reduced supervision of staff because staff are dispersed geographically and can be isolated from other police officers. Area

[7] Data regarding LACs was based on the LACs existing as at March 2009, except for two LACs; Central Hunter and Port Stephens. These LACs were combined in 2008. They were also combined in this study because data for the individual LACs was not available.
[8] Students from some intakes were attested at the end of December, therefore police officers began their duties in the final days of the calendar year. In these cases, data were used for the following calendar year.
[9] Multicollinearity refers to a situation in which two or more factors (other than the main factor of interest) used in a multivariate regression are closely related to each other. This can create difficulties in interpreting the results (Hosmer & Lemeshow, 2000).

of LAC was originally split into a number of categories, but preliminary analyses showed that for most of the categories the relationship between the complaints variables and the area of LAC were similar. LACs were therefore split into two categories and binary coded for area: Less than 1000km^2 (0) and greater than or equal to 1000km^2 (1).

Because variables associated with LACs were calculated according to the first LAC in which an officer was stationed, it was possible that these variables did not account for the entire two years in which a police officer's complaints were sampled for this study. On average, police officers spent 3.3 years at their first LAC. Twenty per cent of officers changed LACs in their first two years of service, spending an average of 1.1 years at their first LAC. Another variable was therefore calculated to indicate whether an officer changed LAC within their first two years of service. This variable was binary coded (1 = the officer changed LAC within their first two years of service; 0 = did not change LAC). This variable not only helps to control for changes in LACs for the *Area of LAC* variable but can also represent a change in stability or environment and can account for any differences that might arise in the occurrence of complaints about police officers or behaviour of police officers in relation to this change.

Other variables used in the analyses included age, which was calculated as the age at attestation (categorised into four groups; 19 to 20 years of age, 21 to 25 years of age, 26 to 30 years of age and 31 or more years of age) and gender of police officers (binary coded; female = 0, male = 1).

Analyses

The analyses were done in two parts for each of the four complaints variables. The first part examined the simple, or bivariate, relationships between the occurrence of complaints and the main variable of interest, the number of students in an intake. The bivariate relationships between the occurrence of complaints and each other variable were also examined. These analyses provide an initial assessment of the variables related to the occurrence of complaints, but they do not allow for a simultaneous assessment of all variables. For example, it is possible that some variables, such as the area of the LAC at which an officer is stationed, or the age of an officer, may be related to the occurrence of complaints and may have a stronger effect on their occurrence than the number of students in an intake. It is therefore necessary to control for these potential influences by using a multivariate approach, which isolates the effects of each variable on the occurrence of complaints while statistically controlling for other variables. If the multivariate analysis (which includes number of students in an intake and any other variable that may affect the occurrence of complaints) shows that the number of students in an intake is related to the occurrence of complaints, then one can have confidence that such a result has come about because the occurrence of complaints is actually associated with the number of students as opposed to some alternative factor. The second part of the analyses therefore involved a multivariate logistic regression to develop a model to determine if the number of students in an intake was related to the occurrence of complaints after controlling for a range of other factors previously shown to influence the behaviour of police officers and/or the occurrence of complaints.

The performance, or adequacy, of each model was assessed by the commonly used Hosmer-Lemeshow goodness-of-fit statistic, which evaluates the fit of the model and the accuracy of the model to predict the rate at which police officers receive complaints (Hosmer & Lemeshow, 2000). The commonly used area under the Receiver Operating Characteristic (ROC) curve was also used to assess the performance of each model. This statistic was used to evaluate the ability of each model to discriminate between police officers who were the subject of a complaint and those who were not. An area under the ROC curve of 0.5 indicates no discriminatory ability, an area of 0.7 – 0.8 indicates an acceptable discriminatory ability and areas above 0.8 indicate excellent discriminative ability (Hosmer & Lemeshow, 2000).

Results

Data for analyses of complaints about any type of misconduct

A total of 5255 police officers were included in the data. Of these, 1674 (32%) were the subject of complaints about any type of misconduct within their first two years of service that resulted in management action. Of the 1674 police officers who were the subject of these complaints, 1215 (73%) were the subject of only one complaint, 330 (20%) were the subject of two complaints, 84 (5%) were the subject of three complaints and the remaining 45 (3%) were the subject of four or more complaints.

Table 2 shows the distribution of the data for the variables used in the analysis of police officers who were the subject of one or more complaints or two or more complaints about any type of misconduct within their first two years of service that resulted in management action. As seen in this table, the percentages of police officers who were the subject of one or more complaints was similar for all categories of number of students in an intake (between 31% and 33%) as were the percentages of police officers who were the subject of two or more complaints (between 7% and 11%).

Table 2. Distribution of the data for the variables used in analyses of police officers who were the subject of one or more complaints or two or more complaints about any types of misconduct in their first two years of service (n = 5255).

Variable	Category	n (% of total)	% with one or more complaints	% with two or more complaints
Number of students	< 300	786 (15%)	31	11
	300 - 399	1773 (34%)	33	9
	400 – 499	788 (15%)	33	7
	500 +	1908 (36%)	31	9
Age	19 – 20	649 (12%)	38	13
	21 - 25	2159 (41%)	32	9
	26 - 30	1252 (24%)	29	7
	31 +	1195 (23%)	30	8
Gender	Female	1557 (30%)	29	7
	Male	3698 (70%)	33	9
Area of LAC (km^2)	< 1000	4195 (80%)	31	8
	1000+	1060 (20%)	36	11
Changed LAC	No	4221 (80%)	31	8
	Yes	1034 (20%)	36	10

Analyses of police officers with one or more complaints about any type of misconduct

When a bivariate chi-squared analysis was done to test for an association between police officers with one or more complaints about any type of misconduct and the number of students in an intake, the test produced a *p*-value[10] of more than 0.05, indicating that there was no significant relationship between the likelihood of a police officer receiving one or more complaints in their first two years of service and the number of students in the intake in which they were trained ($\chi^2 = 3.92$, df = 3, $p = 0.27$). Bivariate tests along with the data in Table 2 also indicated that police officers were more likely to be the subject of one or more complaints in their first two years of service if they were younger ($\chi^2 = 16.68$, df = 3, $p = 0.001$)[11], male ($\chi^2 = 7.85$, df = 1, $p = 0.005$), initially stationed at a LAC with an area of at least 1000km^2 ($\chi^2 = 8.30$, df = 1, $p = 0.004$) and if they had changed LACs within their first two years of service ($\chi^2 = 7.74$, df = 1, $p = 0.005$).[12]

[10] *P*-values are used to determine the statistical significance of a test. A *p*-value less than 0.05 indicates a statistically significant difference.

[11] Note that all findings reported in this paper describe relationships between the relevant variables but do not necessarily infer that these relationships are causal in nature.

[12] The bivariate tests indicate that each of age, gender, area of LAC and whether or not an officer changed LAC are individually associated with the likelihood of an officer receiving complaints. These tests should not be interpreted simultaneously. For example, the results do not imply that a police officer who is young and male and initially stationed at a LAC of more than 1000km^2 and who changed LAC within their first two years of service is more likely to be the subject of complaints than any other officer.

The variables described in the bivariate tests were used in the multivariate logistic regression to build the final statistical model. The statistical results, including the *p*-values and odds ratios (OR), from the final multivariate model are shown in Table 3. A *p*-value less than 0.05 indicates a statistically significant difference in the likelihood of a police officer receiving one or more complaints between one category within a variable and another category within that same variable (the second category is pre-determined and is referred to as the reference category). For example, Table 3 shows that the *p*-value for police officers aged 21 to 25 is 0.004. This indicates that there is a statistically significant difference in the likelihood of police officers receiving one or more complaints between officers aged 21 to 25 and those aged 19 to 20 (the reference category). An odds ratio provides more information about the difference by describing the ratio of the odds (or the likelihood) of an event occurring in one category to the odds of it occurring in the reference category. For example, Table 3 shows that the OR for police officers aged 21 to 25 is 0.76. Therefore, the odds of police officers aged 21 to 25 being the subject of one or more complaints about any type of misconduct is 0.76 times[13] the odds for police officers aged 19 to 20 (the reference category). The OR 95% confidence interval (CI) represents the interval within which the value of the true odds ratio lies at the 95% confidence level.[14] See Hosmer and Lemeshow (2000) for more details on interpreting logistic regression analyses.

The final model in Table 3 showed that there was no significant difference in the likelihood of police officers receiving one or more complaints between officers trained in intakes with less than 300 students and those trained in intakes with 300 to 399 students ($p = 0.321$), 400 to 499 students ($p = 0.436$) or 500 or more students ($p = 0.660$). The final model therefore suggests that after controlling for the other variables, there was no significant relationship between the number of students in the intake in which a police officer was trained and whether a police officer was the subject of one or more complaints about any type of misconduct in their first two years of service.

[13] An OR less than 1 indicates the odds of an event occurring are less than the odds of that event occurring in the reference category. An OR equal to one indicates the odds of an event occurring are equal to the odds of it occurring in the reference category. An OR greater than 1 indicates the odds of an event occurring are greater than the odds of it occurring in the reference category.
[14] The OR calculated in an analysis is based on the sample of the population used in the analysis (in this case, the sample of NSW police officers). The true OR refers to the OR for the entire population. The 95% confidence level means that if this comparison were to be repeated on multiple occasions, the calculated confidence interval would encompass the true OR 95% of the time.

Table 3. Results of the final logistic regression model for police officers who were the subject of one or more complaints about any type of misconduct in their first two years of service (n = 5255).

Variable	Category	Parameter estimate (Standard error)	*p*	Odds Ratio (OR)	OR 95% Confidence interval (CI)
Intercept		-0.742 (0.119)	<0.001		
Number of students	< 300*			1.00	
	300 - 399	0.092 (0.093)	0.321	1.10	0.91 - 1.32
	400 – 499	0.085 (0.109)	0.436	1.09	0.88 - 1.35
	500 +	-0.041 (0.093)	0.660	0.96	0.80 - 1.15
Age	19 – 20*			1.00	
	21 - 25	-0.271 (0.094)	0.004	0.76	0.64 - 0.92
	26 - 30	-0.436 (0.103)	<0.001	0.65	0.53 - 0.79
	31 +	-0.401 (0.104)	<0.001	0.67	0.55 - 0.82
Gender	Female*			1.00	
	Male	0.221 (0.067)	0.001	1.25	1.09 - 1.42
Area of LAC (km^2)	< 1000*			1.00	
	1000 +	0.256 (0.074)	0.001	1.29	1.12 - 1.49
Changed LAC	No*			1.00	1.00
	Yes	0.224 (0.074)	0.001	1.25	1.08 - 1.45

*reference category

As can be seen in Table 3 the analysis also showed that after controlling for the other variables in the model:

- Younger officers were at greater risk of being the subject of one or more complaints about any type of misconduct than older officers (for age 21-25 OR = 0.76, 95% CI 0.64-0.92; for age 26-30 OR = 0.65, 95% CI 0.53-0.79; for age 31+ OR = 0.67, 95% CI 0.55-0.82);
- Males were at greater risk of being the subject of one or more complaints about any type of misconduct than females (OR = 1.25, 95% CI 1.09-1.42);
- Police officers stationed at LACs with an area of 1000km^2 or more were at greater risk of being the subject of one or more complaints about any type of misconduct than those at smaller sized LACs (OR = 1.29, 95% CI 1.12-1.49); and
- Police officers who changed LACs within their first two years of service were at greater risk of being the subject of one or more complaints about any type of misconduct than those who did not change LACs (OR = 1.25, 95% CI 1.08-1.45).[15]

[15] The tests indicate that each of age, gender, area of LAC and whether or not an officer changed LAC are individually associated with the likelihood of an officer receiving complaints, all other variables being equal. These tests should not be interpreted simultaneously. For example, the results do not imply that a police officer who is young and male and initially stationed at a LAC of more than 1000km^2 and who changed LAC within their first two years of service is more likely to be the subject of complaints than any other officer.

The Hosmer-Lemeshow test statistic was not significant ($\chi^2 = 9.57$, df = 8, p = 0.30), indicating that the model fit the data well and is accurate at predicting the proportion of police officers who are the subject of one or more complaints within their first two years of service. The area under the ROC curve was, however, 0.56, indicating a poor ability of the model to discriminate between officers who attract one or more complaints within their first two years of service and those who do not. The model is, therefore adequate to estimate the proportion of police officers who are the subject of one or more complaints about any type of misconduct, but it cannot discriminate between police officers who are the subject of one or more complaints and those who are not. This implies that the statistically significant relationships in the final model (between the one or more complaints variable and the age of a police officer, their gender, the area of the first LAC at which they were stationed and whether or not they changed LAC in their first two years of service) do not appear to exert a large enough effect on the occurrence of complaints to be useful to determine whether or not an officer will be the subject of one or more complaints about any type of misconduct in their first two years of service. The statistically significant relationships should, therefore, be treated with caution.

Analyses of police officers with two or more complaints about any type of misconduct

When a bivariate chi-squared analysis was done to test for an association between police officers with two or more complaints about any type of misconduct and the number of students in an intake, the test produced a *p*-value of more than 0.05, indicating that there was no significant relationship between the likelihood of a police officer receiving two or more complaints about any type of misconduct in their first two years of service and the number of students in the intake in which they were trained ($\chi^2 = 6.07$, df = 3, $p = 0.11$). Bivariate tests along with the data in Table 2 also indicated that police officers were more likely to be the subject of two or more complaints in their first two years of service if they were younger ($\chi^2 = 17.46$, df = 3, $p = 0.001$), male ($\chi^2 = 7.41$, df = 1, $p = 0.006$) and initially stationed at a LAC with an area of at least 1000km^2 ($\chi^2 = 7.09$, df = 1, $p = 0.008$). The bivariate tests showed that there was no significant relationship between the likelihood of a police officer receiving two or more complaints about any type of misconduct in their first two years of service and whether a police officer had changed LACs within their first two years of service ($\chi^2 = 2.74$, df = 1, $p = 0.10$).

Table 4. Results of the final logistic regression model for police officers who were the subject of two or more complaints about any type of misconduct in their first two years of service (n = 5255).

Variable	Category	Parameter estimate (Standard error)	*p*	Odds Ratio (OR)	OR 95% Confidence interval
Intercept		-1.974 (0.182)	<0.001		
Number of students	< 300*			1.00	
	300 - 399	-0.290 (0.144)	0.044	0.75	0.56 - 0.99
	400 – 499	-0.441 (0.180)	0.014	0.64	0.45 - 0.92
	500 +	-0.309 (0.142)	0.030	0.74	0.56 - 0.97
Age	19 – 20*			1.00	
	21 - 25	-0.460 (0.140)	0.001	0.63	0.48 - 0.83
	26 - 30	-0.702 (0.161)	<0.001	0.50	0.36 - 0.68
	31 +	-0.675 (0.162)	<0.001	0.51	0.37 - 0.70
Gender	Female*			1.00	
	Male	0.346 (0.115)	0.003	1.41	1.13 - 1.78
Area of LAC (km^2)	< 1000*			1.00	
	1000 +	0.376 (0.116)	0.001	1.46	1.16 - 1.83
Changed LAC	No*			1.00	
	Yes	0.250 (0.119)	0.036	1.29	1.02 - 1.62

*reference category

The variables described in the bivariate tests were used in the multivariate logistic regression to build the final statistical model. The statistical results from the final multivariate model are shown in Table 4.

The final model in Table 4 showed that there was a statistically significant difference in the likelihood of police officers receiving one or more complaints between officers trained in intakes with less than 300 students and those trained in intakes with 300 to 399 students ($p = 0.044$), 400 to 499 students ($p = 0.014$) or 500 or more students ($p = 0.030$). Specifically, Table 4 shows that police officers are less likely to be the subject of two or more complaints about any type of misconduct if they are trained in intakes with 300 to 399 students (OR = 0.75, 95%CI 0.56-0.99), 400 to 499 students (OR = 0.64, 95% CI 0.45-0.92) or 500 or more students (OR = 0.74, 95% CI 0.56-0.97) than police officers trained who were trained in intakes with less than 300 students (the reference category). As can be seen in Table 4, the relationships between the sizes of intakes and police officers with two or more complaints about any type of misconduct are statistically significant at $p = 0.05$. They are not, however, statistically significant at $p = 0.01$, suggesting that the relationships are weak.[16] Also, as shown in Table 4, the relationships are weaker than those between police officers with two or more complaints and age, gender and area of LAC, which have p values much smaller than 0.01. In addition, Table 2 shows that 11 per cent of police officers from the intake category of less than 300 students were the subject of two or more complaints about any type of misconduct. This percentage is marginally larger than the seven to nine per cent of police officers from other intake categories and supports the notion that a weak relationship exists between size of an intake and police officers being the subject of two or more complaints. Therefore, although the relationship between the size of an intake and police officers with two or more complaints is statistically significant, it is weak and in practice, the difference is very small and most probably unimportant.

As shown in Table 4, the final model also suggests that after controlling for the other variables:

- Younger officers were at greater risk of being the subject of two or more complaints about any type of misconduct than older officers (for age 21-25 OR = 0.63, 95% CI 0.48-0.83; for age 26-30 OR = 0.50, 95% CI 0.36-0.68; for age 31+ OR = 0.51, 95% CI 0.37-0.70);
- Males were at greater risk of being the subject of two or more complaints about any type of misconduct than females (OR = 1.41, 95% CI 1.13-1.78);
- Police officers stationed at LACs with an area of 1000km^2 or more were at greater risk of being the subject of two or more complaints about any type of misconduct than those at smaller sized LACs (OR = 1.46, 95% CI 1.16-1.83); and
- Police officers who changed LACs within their first two years of service were at greater risk of being the subject of two or more complaints about any type of misconduct than those who did not change LACs (OR = 1.29, 95% CI 1.02-1.62), although this relationship was weaker ($p = 0.036$) than the relationships between the size of an intake and a police officer's age, gender and the area of the LAC in which they were first stationed (all p-values ≤ 0.003).

The Hosmer-Lemeshow test statistic was not significant ($\chi^2 = 8.45$, df = 8, $p = 0.39$). The area under the ROC curve was 0.59. As explained previously, the model is therefore adequate to estimate the proportion of police officers who are the subject of two or more complaints about any type of misconduct, but it cannot discriminate between police officers who are the subject of two or more complaints and those who are not. This implies that the statistically significant relationships in the analysis (between the two or more complaints variable and each other variable) do not appear

[16] Statistical analyses are more likely to detect an effect or a relationship as sample size increases. When large sample sizes are used in an analysis (e.g. the number of police officers, which in this study is equal to 5255), statistically significant effects can be weak and unimportant (Agresti, 2007 p.218). In some studies with large sample sizes, the detection of weak effects or relationships is avoided by using a p-value of 0.01 for significance testing instead of the conventional 0.05.

to exert a large enough effect on the occurrence of complaints to be useful to determine whether or not an officer will be the subject of two or more complaints about any type of misconduct in their first two years of service. All statistically significant relationships in the final model should, therefore, be treated with caution.

Analyses of complaints about types of misconduct that were likely to involve ethical issues

Of the 5255 police officers included in the data, 1336 (25%) were the subject of complaints about a type of misconduct that was likely to involve ethical issues within their first two years of service that resulted in management action. Of the 1336 police officers who were the subject of these complaints, 1025 (77%) were the subject of only one complaint, 232 (17%) were the subject of two complaints, 54 (4%) were the subject of three complaints and the remaining 25 (2%) were the subject of four or more complaints.

Table 5. Distribution of the data for the variables used in the analysis for police officers who were the subject of one or more complaints or two or more complaints about types of misconduct likely to involve ethical issues in their first two years of service (n = 5255).

Variable	Category	n (% of total)	% with one or more complaints	% with two or more complaints
Number of students	< 300	786 (15%)	24	7
	300 - 399	1773 (34%)	27	6
	400 – 499	788 (15%)	25	6
	500 +	1908 (36%)	25	5
Age	19 – 20	649 (12%)	31	9
	21 - 25	2159 (41%)	26	6
	26 - 30	1252 (24%)	24	5
	31 +	1195 (23%)	23	5
Gender	Female	1557 (30%)	23	5
	Male	3698 (70%)	26	6
Area of LAC (km^2)	< 1000	4195 (80%)	24	5
	1000+	1060 (20%)	30	8
Changed LAC	No	4221 (80%)	25	6
	Yes	1034 (20%)	28	7

Table 5 shows the distribution of the data for the variables used in the analysis of police officers who were the subject of one or more complaints or two or more complaints about a type of misconduct that was likely to involve an ethical issue within their first two years of service that resulted in management action. As seen in this table, the percentage of police officers who were the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue was similar (between 24% and 27%) for all categories of number of students in an intake.

The percentage of police officers who were the subject of two or more complaints was also similar for all categories of size of intake (between 5% and 7%).

Analyses of police officers with one or more complaints about types of misconduct likely to involve ethical issues

When a bivariate chi-squared analysis was done to test for an association between police officers with one or more complaints about types of misconduct likely to involve ethical issues and the number of students in an intake, the test produced a *p*-value of more than 0.05, indicating that there was no significant relationship between the likelihood of a police officer receiving one or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service and the number of students in the intake in which they were trained ($\chi^2 = 3.68$, df = 3, $p = 0.30$). Other bivariate tests, along with the information in Table 5, indicated that police officers were more likely to be the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service if they were younger ($\chi^2 = 15.61$, df = 3, $p = 0.001$), male ($\chi^2 = 5.51$, df = 1, $p = 0.02$), initially stationed at a LAC with an area of at least $1000km^2$ ($\chi^2 = 11.80$, df = 1, $p = 0.001$) and if they had changed LACs within their first two years of service ($\chi^2 = 5.76$, df = 1, $p = 0.02$).

The variables described in the bivariate tests were used in the multivariate logistic regression to build the final statistical model. The statistical results from the final multivariate model are shown in Table 6.

The final model in Table 6 showed that there was no significant difference in the likelihood of police officers receiving one or more complaints about a type of misconduct that was likely to involve an ethical issue between officers trained in intakes with less than 300 students and those trained in intakes with 300 to 399 students ($p = 0.236$), 400 to 499 students ($p = 0.858$) or 500 or more students ($p = 0.948$). The final model therefore suggests that after controlling for the other variables, there was no significant relationship between the number of students in the intake in which a police officer was trained and whether a police officer was the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service.

Table 6. Results of the final logistic regression model for police officers who were the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service (n = 5255).

Variable	Category	Parameter estimate (Standard error)	*p*	Odds Ratio (OR)	OR 95% Confidence interval
Intercept		-1.071 (0.127)	<0.001		
Number of students	< 300*			1.00	
	300 - 399	0.118 (0.100)	0.236	1.13	0.93 - 1.37
	400 – 499	0.013 (0.118)	0.858	1.01	0.81 - 1.28
	500 +	-0.006 (0.099)	0.948	0.99	0.82 - 1.21
Age	19 – 20*			1.00	
	21 - 25	-0.256 (0.099)	0.009	0.77	0.64 - 0.94
	26 - 30	-0.390 (0.109)	<0.001	0.68	0.55 - 0.84
	31 +	-0.461 (0.111)	<0.001	0.63	0.51 - 0.78
Gender	Female*			1.00	
	Male	0.201 (0.072)	0.005	1.22	1.06 - 1.41
Area of LAC (km^2)	< 1000*			1.00	
	1000 +	0.311 (0.078)	<0.001	1.37	1.17 - 1.60
Changed LAC	No*			1.00	
	Yes	0.217 (0.079)	0.006	1.24	1.07 - 1.45

*reference category

As seen in Table 6, the analysis also showed that after controlling for the other variables in the model:

- Younger officers were at greater risk of being the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue than older officers (for age 21-25 OR = 0.77, 95% CI 0.64-0.94; for age 26-30 OR = 0.68, 95% CI 0.55-0.84; for age 31+ OR = 0.63, 95% CI 0.51-0.78);
- Males were at greater risk of being the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue than females (OR = 1.22, 95% CI 1.06-1.41);
- Police officers stationed at LACs with an area of 1000km^2 or more were at greater risk of being the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue than those at smaller sized LACs (OR = 1.37, 95% CI 1.17-1.60); and
- Police officers who changed LACs within their first two years of service were at greater risk of being the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue than those who did not change LACs (OR = 1.24, 95% CI 1.07-1.45).

The Hosmer-Lemeshow test statistic was not significant (χ^2 = 6.19, df = 8, p = 0.63). The area under the ROC curve was 0.56. As explained previously, the model is adequate to estimate the proportion of police officers who are the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue, but it cannot discriminate between police officers who are the subject of one or more complaints and those who are not. This implies that statistically significant relationships in the final model (between the one or more complaints variable and the age of a police officer, their gender, the area of the first LAC in which they were stationed and whether or not they changed LAC in their first two years of service) do not appear to exert a large enough effect on the occurrence of complaints to be useful to determine whether or not an officer will be the subject of one or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service. The statistically significant relationships should, therefore, be treated with caution.

Analyses of police officers with two or more complaints about types of misconduct likely to involve ethical issues

When a bivariate chi-squared analysis was done to test for an association between police officers with two or more complaints about types of misconduct likely to involve ethical issues and the number of students in an intake, the test produced a p-value of more than 0.05, indicating that there was no significant relationship between the likelihood of a police officer receiving two or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service and the number of students in the intake in which they were trained (χ^2 = 2.33, df = 3, p = 0.51). A bivariate test also showed there was also no significant relationship between the likelihood of a police officer receiving two or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service and whether the officer changed LAC within their first two years of service (χ^2 = 1.62, df = 1, p = 0.20).

Other bivariate tests along with the data in Table 5 did, however, indicate that police officers were more likely to be the subject of two or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service if they were younger (χ^2 = 17.16, df = 3, p = 0.001), male (χ^2 = 3.89, df = 1, p = 0.049; although this relationship is weak) and initially stationed at a LAC with an area of at least 1000km^2 (χ^2 = 9.79, df = 1, p = 0.002).

The variables described in the bivariate tests were used in the multivariate logistic regression to build the final model. The statistical results from the final multivariate model are presented in Table 7.

Table 7. Results of the final logistic regression model for police officers who were the subject of two or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service (n = 5255).

Variable	Category	Parameter estimate (Standard error)	*p*	Odds Ratio (OR)	OR 95% Confidence interval
Intercept		-2.367 (0.213)	<0.001		
Number of students	< 300*			1.00	
	300 - 399	-0.220 (0.174)	0.206	0.80	0.57 - 1.13
	400 – 499	-0.164 (0.207)	0.428	0.85	0.57 - 1.27
	500 +	-0.307 (0.173)	0.077	0.74	0.52 - 1.03
Age	19 – 20*			1.00	
	21 - 25	-0.467 (0.163)	0.004	0.63	0.46 - 0.86
	26 - 30	-0.820 (0.193)	<0.001	0.44	0.30 - 0.64
	31 +	-0.788 (0.193)	<0.001	0.46	0.31 - 0.66
Gender	Female*			1.00	
	Male	0.320 (0.137)	0.019	1.38	1.05 - 1.80
Area of LAC (km^2)	< 1000*			1.00	
	1000 +	0.484 (0.134)	<0.001	1.62	1.25 - 2.11

*reference category

The final model in Table 7 showed that there was no significant difference in the likelihood of police officers receiving one or more complaints between officers trained in intakes with less than 300 students and those trained in intakes with 300 to 399 students (p = 0.206), 400 to 499 students (p = 0.428) or 500 or more students (p = 0.077). The results therefore suggest that after controlling for the other variables included in the model, there was no significant relationship between the number of students in the intake in which a police officer was trained and whether a police officer was the subject of two or more complaints about a type of misconduct that was likely to involve an ethical issue in their first two years of service.

As seen in Table 7, the analysis also showed that after controlling for the other variables in the model:

- Younger officers were at greater risk of being the subject of two or more complaints about a type of misconduct that was likely to involve an ethical issue than older officers (for age 21-25 OR = 0.63, 95% CI 0.46-0.86; for age 26-30 OR = 0.44, 95% CI 0.30-0.64; for age 31+ OR = 0.46, 95% CI 0.31-0.66);
- Males were at greater risk of being the subject of two or more complaints about a type of misconduct that was likely to involve an ethical issue than females (OR = 1.38, 95% CI 1.05-1.80); and
- Police officers stationed at LACs with an area of 1000 km^2 or more were at greater risk of being the subject of two or more complaints about a type of misconduct

that was likely to involve an ethical issue than those at smaller sized LACs (OR = 1.62, 95% CI 1.25-2.11).

The Hosmer-Lemeshow test statistic was not significant (χ^2 = 6.96, df = 8, p = 0.54). The area under the ROC curve was 0.55. As explained previously, the model is adequate to estimate the proportion of police officers who are the subject of two or more complaints about a type of misconduct that was likely to involve an ethical issue, but it cannot discriminate between police officers who are the subject of two or more complaints and those who are not. This implies that the statistically significant relationships in the final model (between the two or more complaints variable and the age of an officer, their gender and the area of the LAC in which they were first stationed) do not appear to exert a large enough effect on the occurrence of complaints to be useful to distinguish whether or not an officer will be the subject of two or more complaints about a type of misconduct that was likely to involve an ethical issue. The statistically significant relationships should, therefore, be treated with caution.

Summary of Results

The number of students in the intake in which a police officer was trained at the NSW Police College:

- was not related to a police officer being the subject of one or more complaints concerning any types of misconduct in their first two years of service that resulted in management action;
- was weakly related to a police officer being the subject of two or more complaints concerning any types of misconduct in their first two years of service that resulted in management action. This weak relationship showed that police officers from the smallest category of size of intake (less than 300 students per intake) were more likely to be the subject of two or more complaints concerning any types of misconduct in their first two years of service and that resulted in management action than police officers trained in intakes with more than 300 students. This relationship is, however, very weak and unlikely to be of practical importance;
- was not related to a police officer being the subject of one or more complaints concerning types of misconduct that are likely to involve ethical issues in their first two years of service that resulted in management action; and
- was not related to a police officer being the subject of two or more complaints concerning types of misconduct that are likely to involve ethical issues in their first two years of service that resulted in management action.

Discussion

All of the bivariate and multivariate analyses for police officers who were the subject of one or more complaints or two or more complaints about any type of misconduct or about types of misconduct that are likely to involve ethical issues showed the same results: that police officers trained in large intakes were not more likely to be the subject of complaints than police officers trained in smaller intakes.

The results of Project Marrella have therefore unequivocally shown that police officers trained in larger than usual intakes are not more likely to be the subject of complaints than those trained in smaller intakes during their first two years of service. Hence the perception that students trained in larger than usual intakes at police colleges and academies are more likely to engage in misconduct once they become police officers than those trained in smaller intakes does not apply for NSW police officers when complaints are used as a measure of misconduct and police officers are examined for a period of two years.

The percentages of police officers who were the subject of complaints were similar regardless of the numbers of students in the intake in which they were trained. This was the case for both police officers who were the subject of complaints about any type of misconduct (where of 31% to 33% officers were the subject of one or more complaints and 7% to 11% were the subject of two or more complaints regardless of the size of the intake in which they were trained) and officers who were the subject of types of misconduct that were likely to involve ethical issues (where 24% to 27% of officers were the subject of one or more complaints and 5% to 7% were the subject of two or more complaints regardless of the size of the intake in which they were trained).

It is possible that the perception regarding the sizes of intakes at police colleges and academies could appear to be true when large intakes are attested and begin employment because, even though the proportion of police officers who are the subject of a complaint in small and large intakes is similar, the number of police officers who are the subject of complaints is much larger when large intakes are attested. For example, if 25 per cent of police officers attested from the NSW Police College are the subject of a complaint within their first two years of service, then when 800 students are attested, 200 of these will be the subject of a complaint within their first two years of service. If 300 students are attested, then 75 of these will be the subject of a complaint in their first two years of service. Because the raw numbers can be markedly different, it can therefore *seem* that police officers are more likely to be the subject of a complaint when larger than usual intakes are trained.

It is important to note that this study uses complaints as a measure of misconduct. As mentioned previously, misconduct is difficult to measure and in this study, using complaints data was the only feasible way to measure it. In order to achieve a measure of misconduct that was more specific than simply whether an officer had been the subject of a complaint, this study sought to focus the complaints variable by including only complaints that resulted in management action being taken against the subject officer. The complaints variable was further focused in two of the analyses by including only complaints describing types of misconduct that were likely to involve ethical issues. By focusing in this way, the complaints variables were most relevant to the aims of the study. Additionally, for the complaints variables that included only complaints describing types of misconduct that were likely to involve ethical issues, complaints about events involving minor misconduct were less likely to be included in the data. Even with such a strict and conservative definition of a complaint, the likelihood of a police officer being the subject of a complaint did not increase with the number of students in the intake in which the officer was trained. Furthermore, two different sets of complaints variables were created to test the validity of the perception about the sizes of intakes using different measures of misconduct by police officers. The first set examined police officers who were the subject of any number of complaints versus those who were not the subject of complaints. The second set focussed the complaints variable even further by examining police officers who were the subject of two or more complaints versus those who were not the subject of two or more complaints. Again, even by focussing the complaints variable to consider police officers who had repeated numbers of complaints and therefore, potentially more problems with behaviour or misconduct, the likelihood of a police officer being the subject of a complaint did not increase with the number of students in the intake in which the officer was trained.

One potential explanation for the lack of a relationship between complaints and the number of students per intake is that two years of service is not sufficient time for problem behaviour to emerge among police officers who are trained in larger than usual intakes. One of the 11 key informants interviewed by Chan and Dixon (2007) mentioned that for police officers recruited and trained in large intakes, problems with corruption and misconduct occurred three years after training. Another key informant suggested this occurred five years after training. Following police officers for a longer time period after attestation may therefore show a different relationship between complaints and the number of students per intake. Collecting data over a longer timeframe does, however, require consideration of additional variables that may affect whether a police officer is the subject of a complaint. For example, new police officers are assigned to general duties for a minimum of three years, but once this period has ended, they are able to specialise into different types of duties. Performing different types of duties can affect the numbers of complaints that police officers receive against them (Ede et al., 2002). A variable describing the duties an officer performs may therefore be important if more than three years of data are examined. Data for such additional variables is, however, not easily obtainable. Also, if a time period of three or more years is chosen, some of the largest intakes at the NSW Police College would not be included in the data (e.g. the intake in which 801 students were attested in January 2007). Hence, if such intakes are to be included in the analyses, more time must pass before the analyses can be done.

Complaints can be made by members of the public as well as by police officers. In addition, it is common for supervisors to make complaints regarding the performance of the officers they supervise. Complaints data, therefore, captures a wide range of problems associated with the behaviour of police officers. Despite this, it is possible that the number of students in an intake in which a police officer was trained could affect aspects of behaviour or misconduct by police officers that are not captured in complaints data. In other words, it is possible that police officers trained in large intakes could experience more problems related to their performance that do not lead to complaints than police officers trained in smaller intakes. If such problems exist, they are likely to be very minor because they do not result in complaints. These problems may therefore not be recorded systematically by the NSW Police Force. As a result, they would be very difficult to identify and measure.

The bivariate results for police officers who were the subject of one or more complaints about any type of misconduct showed that a significant relationship existed between this variable and each of *Age*, *Gender*, *Area of LAC* and *Changed LAC*. The multivariate model, however, was not able to use these variables to discriminate between police officers who were the subject of one or more complaints about any type of misconduct and those who were not. Therefore, the age of an officer, their gender, the area of the first LAC at which they were stationed and whether the officer changed LAC in their first two years of service may not be useful in predicting a police officer's risk of being the subject of one or more complaints about any type of misconduct. Similar results were found for the other bivariate and multivariate analyses. It is possible that other variables for which data were not available in this study could improve the ability of the model to discriminate between police officers who received complaints and those who did not. The model may be improved if such variables were to have a strong relationship with the occurrence of complaints. Some variables that may be useful include: whether the police officer had a tertiary education before beginning training at the NSW Police College; the number of sessions the officer participated in at the College; and whether the officer failed any subjects at the College. Further research would be necessary to determine which, if any, of these variables would be most useful.

As mentioned above, this study sought to focus the complaints variables by including only complaints that resulted in management action being taken against the subject officer and in some analyses, only complaints regarding types of misconduct that were likely to involve ethical issues In addition, some analyses focused the complaints variable further by considering only police officers who were the subject of two or more complaints and therefore exhibited an increased level of problem behaviour than police officers who were the subject of fewer complaints. Although these complaints variables were appropriate for the aims of this study, other work using complaints as a measure of misconduct could focus the complaints variable further, perhaps by focusing on a particular type of complaint, such as excessive use of force and/or by focusing on particular types of management actions, such as reductions in rank or involuntary terminations. Using a more focused complaint variable may help improve the model and determine whether the other variables used in this study, such as those relating to the age of a police officer, their gender or the area of the first LAC in which they were stationed are useful in predicting a police officer's risk of being the subject of certain types of complaints.

The results of this study have no immediate implications for the NSW Police Force and their recruitment and/or training practices. It is, however, important to note that while the likelihood of a police officer being the subject of complaints was not greater for police officers trained in large intakes, there may be other problems associated with training police officers in large intakes, such as those described above. These problems could not be easily measured and were not considered in this study. Also, this study made no attempt to assess the quality of the recruitment or training processes used by the NSW Police Force when different sized intakes were trained. It is therefore not possible to establish whether training in large intakes is preferable to training in small intakes or *vice versa*.

The research described in this paper found no evidence to support the perception that police officers trained in larger than usual intakes at the NSW Police College are more likely to engage in misconduct once they become police officers than those trained in smaller intakes. Consequently, there is no need for the NSW Police Force to modify their current recruitment or training practices in relation to the number of students in a training intake at the NSW Police College.

Conclusion

The results of this study showed that the likelihood of a police officer being the subject of a complaint about any type of misconduct or about types of misconduct likely to involve ethical issues within their first two years of service did not increase with the number of students in the intake in which the officer was trained. Therefore, the perception that police officers trained in larger than usual intakes at police colleges and academies are more likely to engage in misconduct once they become police officers than those trained in smaller intakes does not apply for NSW police officers when complaints are used as a measure of misconduct and police officers are examined for a period of two years. It is possible that the perception regarding the sizes of intakes at police colleges and academies could appear to be true when large intakes are attested and begin employment because, even though the proportion of police officers who are the subject of a complaint in small and large intakes is similar, the raw numbers of police officers who are the subject of complaints is much larger when large intakes are attested. The results of this study suggest that the NSW Police Force does not need to modify its current recruitment or training practices.

Acknowledgements

The author would like to thank Tony Bertoia for providing advice, assisting with data preparation and commenting on an earlier draft of this paper. Thanks also to Peter Barnett, Angela Gorta and two reviewers from the Independent Commission Against Corruption for their comments on the paper.

References

Agresti, A. (2007) An Introduction to Categorical Data Analysis. 2nd ed, John Wiley and Sons, New York.

Alley, A., Waugh, L., and Ede, A. (1996) Police culture, women police and attitudes towards misconduct. First Australasian Women Police Conference, Sydney.

Brandl, S.G., Stroshine, M.S., and Frank, J. (2001) Who are the complaint-prone officers? An examination of the relationship between police officers' attributes, arrest activity, assignment, and citizens' complaints about excessive force. Journal of Criminal Justice 29: 521- 529.

Cao, L., and Huang, B. (2000) Determinants of citizen complaints against police abuse of power. Journal of Criminal Justice 28: 203-213.

Chan, J., and Dixon, D. (2007) The politics of police reform: Ten years after the Royal Commission into the New South Wales Police Service. Criminology and Criminal Justice 7:443–468.

Cochrane, R.E., Tett, R.P., and Vandecreek, L. (2003) Psychological testing and the selection of police officers: A national survey. Criminal Justice and Behavior 30:511-537.

Criminal Justice Commission (1997) Integrity in the Queensland Police Service: Implementation and impact of the Fitzgerald Inquiry reforms. Criminal Justice Commission, Brisbane.

Detrick, P., Chibnall, J.T., and Luebbert, M.C. (2004) The Revised NEO Personality Inventory as predictor of police academy performance. Criminal Justice and Behavior 31:676-694.

Ede, A., Homel, R., and Prenzler, T. (2002) Reducing complaints against police and preventing misconduct: A diagnostic study using hot spot analysis. The Australian and New Zealand Journal of Criminology 35:27-42.

Fyfe, J.J., and Kane, R. (2006) Bad Cops: A study of career-ending misconduct among New York City police officers. National Institute of Justice, Washington DC.

Goldsmith, A.J. (1991) External review and self-regulation: Police accountability and the dialectic of complaints procedures. In Goldsmith, A.J. (ed.) Complaints against the police: The trend to external review. Oxford University Press, Melbourne.

Goldsmith, A.J. (1996) What's wrong with complaint investigations? Dealing with difference differently in complaints against police. Criminal Justice Ethics 15:36-55.

Griswold, D.B. (1994) Complaints against the police: Predicting dispositions. Journal of Criminal Justice 22:215-221.

Hosmer, D.W., and Lemeshow, S. (2000) Applied logistic regression. 2nd Edition. John Wiley and Sons, New York.

Kappeler, V.E., Sapp, A., and Carter, D.L. (1992) Police officer higher education, citizen complaints, and departmental rule violations. American Journal of Police 11:37-54.

Kutnjak Ivković, S. (2005) Police (mis)behavior: a cross-cultural study of corruption seriousness. Policing: An International Journal of Police Strategies & Management 28:546-566.

Lersch, K.M., and Mieczkowski, T. (1996) Who are the problem-prone officers? An analysis of citizen complaints. American Journal of Police 15:23-44.

Lough, J., and Ryan, M. (2005) Psychological profiling of Australian police officers: An examination of post-selection performance. International Journal of Police Science and Management 7:15-23.

McElvain, J.P., and Kposowa, A.J. (2008) Police officer characteristics and the likelihood of using deadly force. Criminal Justice and Behavior 35:505-521.

Paoline, E.A., and Terrill, W. (2007) Police education, experience, and the use of force. Criminal Justice and Behavior 34:179-196.

Prenzler, T. (2004) Stakeholder perspectives on police complaints and discipline: Towards a civilian control model. Australian and New Zealand Journal of Criminology 37:85-113.

Riksheim, E.C., and Chermak, S.M. (1993) Causes of police behavior revisited. Journal of Criminal Justice 21:353-382.

Sanders, B.A. (2003) Maybe there's no such thing as a "good cop": Organizational challenges in selecting quality officers. Policing: An International Journal of Police Strategies & Management 26:313 - 328.

Sechrest, D.K., and Burns, P. (1992) Police corruption - The Miami case. Criminal Justice and Behavior 19:294-313.

Terrill, W., and Mastrofski, S.D. (2002) Situational and officer-based determinants of police coercion. Justice Quarterly 19:215-248.

Terrill, W., and McCluskey, J. (2002) Citizen complaints and problem officers - Examining officer behavior. Journal of Criminal Justice 30:143-155.

Walker, D. (1986) The relationship between social research and public policy: The case of police selection process. American Journal of Police 5:1-22.

NSW Police Integrity Commission

Address: Level 3, 111 Elizabeth Street, Sydney NSW 2000
Postal Address: GPO Box 3880, Sydney NSW 2001
Telephone: (612) 9321 6700 - **Freecall:** 1800 657 079
Fax: (612) 9321 6799 - **Website:** www.pic.nsw.gov.au

ISBN 1 74003 155 5