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Notes for contributors

Articles for consideration should in the first instance be sent to the Secretariat, Inspector Scott McLaren at mclaren.scott@police.qld.gov.au for initial consideration. They should be no more than 6000 words long (not including references) and be Harvard referenced.

Articles should be based upon the aims and objectives of the journal and the evidence based policing approach.

Contributions

Articles on issues of professional interest are sought from Australasian police officers and police academics. Articles are to be electronically provided to the Secretariat, mclaren.scott@police.qld.gov.au. Articles are to conform to normal academic conventions. Where an article has previously been prepared during the course of employment, whether with a police service or otherwise, the contributor will be responsible for obtaining permission from that employer to submit the article for publication to Police Science. Contributors are expected to adhere to the Journal’s publishing guidelines. These guidelines are available in this journal. All papers are peer-reviewed.

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Message from the President

Superintendent David Cowan
President

Since the Society’s inception in 2013, the annual conference has been one of our primary activities. And that’s for good reason as it brings together police and leading academics from around the world, with exciting research directly relevant to policing challenges. For the last 6 years, we have held the conference at the Australian Institute of Police Management at Manly. Whilst AIPM has served us well over that time, with world leading facilities and warm hospitality, we have felt some ‘growing pains’ in recent years. We have had to carefully manage numbers and keep a reserve list of those who missed out, with many disappointments. The time had come to take a risk and bid AIPM a very appreciative farewell.

In October 2019, we partnered with the Australian Institute of Criminology and held the conference at Old Parliament House in Canberra, with the theme ‘How the Evidence Base can Inform Policing and Law Enforcement’. In the lead up, we had some nerves about whether we would get the numbers required. That was a waste of energy. We had more than 220 attendees with 40 presentations, which is more than double the attendees previously. We were also privileged to have attend the United National Delegation on Crime prevention showcasing our efforts internationally.

I would like to extend my appreciation to our international key note speakers Professor Gloria Laycock, University College London and Dr Renee Mitchell, Sacramento Police. I would also like to sincerely thank the organising committee and in particular Anthony Morgan from the Australian Institute of Criminology who lead the event. It was a huge success and thank you to all who attended and presented.

We are now planning the next conference and partnering with New Zealand Police Evidence Based Policing Centre to be held in Auckland New Zealand 5-7 August 2020. This is a fantastic opportunity for the Society and I encourage you all to attend. What I have learnt from these conferences is that it is not just about the compelling research presented, it is also about the connections you make with other police officers and academics from around the world, who are so willing to collaborate. It also gives you important time to think about some of the complex challenges we all face and hopefully some inspiration to lead evidence based change in community safety.

We concluded the conference with our Annual General Meeting, where I was elected as President. This is a great honour for me and I would like to thank those who put their trust in me to do this important role. I would like to thank outgoing President Assistant Commissioner Debbie Pate, AFP, for her tireless work, steady hard and friendships.

Our Executive Committee will meet shortly to plan the coming year and the ongoing growth of the Society. Our membership continues to grow and we are so fortunate to have the direct support of state police agencies along with New Zealand Police, the Australian Institute of Criminology (AIC), Australian Policing Advisory Agency (ANZPAA), Australian Institute of Police Management (AIPM), Australian Federal Police (AFP) and the Australian Boarder Force (ABF). I would also like to acknowledge University of Queensland and KPMG as special advisors to our Board.

I hope to see you in Auckland, 5-7 August 2020!

Superintendent David Cowan
President – ANZ SEBP

American Society of Evidence-Based Policing (ASEBP)

ASEBP in Review

First, ASEBP has been awarded a $500,000 grant from the US Department of Justice’s National Institute of Justice to develop and implement a curriculum on applied criminology and crime management for sworn officers. This program will fill a critical gap in evidence-based policing by providing law enforcement officers with the skills they need to identify, interpret, apply, and generate research on what works and what matters in policing. The training will also be available to police academics and will serve as a catalyst for the development of sustainable researcher-practitioner partnerships. This three-year award will begin in January of 2020.

ASEBP board members have been travelling the country presenting at a host of practitioner and researcher conferences on the critical importance of evidence-based practices, including the International Association of Chiefs of Police (IACP) Conference, the American Society of Criminology (ASC) Annual Conference, and the FBI National Academy.

While many presentations focus on the broad applicability of EBP, members are also demonstrating both their methodological and subject matter expertise across a broad range of topics including independently conducting randomized controlled trials as a sworn officer, leveraging data to improve diversity in the ranks, sustaining researcher-practitioner and multi-disciplinary partnerships, and evaluating defencence strategies.

ASEBP co-founder Renee Mitchell was also honored as a keynote speaker at this year’s Australia and New Zealand Society of Evidence-Based Policing conference in Canberra, Australia, where she provided an honest assessment of police training.

ASEBP continues to issue a series of materials for its growing membership and the public that summarize relevant research findings with an eye towards integrating results in practice. Research briefs have addressed managing risk of psychological trauma, critical incident impact on community attitudes towards the police, effects of police on crime, collaborative approaches to youth recidivism, reviews of existing body-worn camera literature, and the relationship between police training and procedural justice to name a few. ASEBP also produces and distributes regular research digests and a publicly available blog, in addition to facilitating robust discussions of EBP on social media.

ASEBP also hosted its first annual research-in-brief contest, in which researchers and practitioners were challenged to create a brief and accompanying video that described a crime-related research article. Thought-provoking and highly entertaining submissions came in from across the country, with the winning brief and video – submitted by Lincoln Police Department Officer Luke Bonkiewicz exploring opportunities for crime analysts to drive program and strategy evaluations in law enforcement agencies.

Finally, ASEBP is gearing up to host its fourth annual conference on June 1 and 2, 2020. ASEBP is partnering with American University’s School of Public Affairs to host the conference in the nation’s capital, and we anticipate our most dynamic program to date, including leadership from major city agencies, federal and local government, community groups, world-renowned researchers, and major police associations.

Sergeant Jonas Baughman

Sergeant Jonas Baughman is a 16-year veteran of the Kansas City Police Department (KCPD). A native of the Kansas City area. Sergeant Baughman joined the KCPD after obtaining a B.A. in psychology from Creighton University. He has held assignments in patrol, investigations, crime/intelligence analysis, and administration during his tenure.
Since our previous update, CAN-SEBP has placed a continued emphasis on creating knowledge mobilization tools. In addition to our monthly 4EBP Webcast and Methods Video Series, we have since added “Hands On, How-To” Research Tutorials to our growing collection of tools for police practitioners.

This newest addition to our toolbox takes the form of a short video that contains step-by-step instructions on how to use certain tools and methods to conduct various analyses. To-date, we’ve produced tutorials on how to calculate descriptive statistics in Excel, how to create pivot tables in Excel, and how to calculate the weighted displacement quotient (WDQ), among others. New tutorials are launched monthly and are free to access through the ‘Members Only’ section of the CAN-SEBP website.

Furthermore, we also have new knowledge mobilization tools that we plan to release in the near future, such as Infographics to accompany each of our Methods Videos (for those who prefer to consume the same information from a static image) and podcasts. Keep an eye out on our twitter feed to learn more about these when they launch!

Finally, our biggest development since the previous update, however, has been the launch of Square One – the first ‘What Works’ Centre in the Canadian context. More specifically, Square One provides police practitioners with a rapid assessment of the evidence base for popular policing programs that are used in Canada. This is done by succinctly answering five questions: (1) Is the program based on existing research?; (2) Has the program been independently evaluated?; (3) Was the program rigorously tested?; (4) Have the program evaluation has replicated/reproduced?; and (5) Was the program tested in Canada? Each assessment is conducted by an academic and is subsequently reviewed by an expert in the field through a double-blind process. To-date, we’ve conducted numerous assessments on various programs, such as Gun Buyback Programs and Bicycle Registers, all of which are also free to access through the CAN-SEBP website.

We definitely have lots on-the-go, but lots more in store for 2020! Should anyone want to take part in an 4EBP Webcast, produce a Methods Video or Research Tutorial, or conduct an assessment for Square One, please feel free to get in touch (CANSEBP@gmail.com)!

Canadian Society of Evidence Based Policing (CAN-SEBP)

Jacek Koziarski
PhD Student at the University of Western Ontario

PREVENTING PTSD: TO DEBRIEF OR NOT TO DEBRIEF?

July 2019

Heather Prince

Social scientists are aware that exposure to traumatic events commonly cause psychological distress and can even have lasting effects on individuals’ psychological state and ability to function. This is not only limited to large scale disasters like being in a war zone or natural disaster, as even more common daily catastrophes such as assaults or traffic accidents can also result in severe psychological distress. Since the mid 1980’s, there has been an increasing interest in early psychological interventions, also known as “debriefings,” after exposure to traumatic events. Debriefing is a psychological treatment intended to reduce the distress that arises after exposure to traumatic events, and to prevent the development of Post-Traumatic Stress Disorder (PTSD) or other psychiatric disorders from occurring.

Particularly, the use of single session, one-time individual psychological debriefings have increased over the last 20 years in hopes of preventing the onset of Post-Traumatic Stress Disorder (PTSD) and reducing overall psychological distress. This practice originated in the military, where the goal was to use these early interventions to help get soldiers back into combat sooner and experience less psychological trauma. Debriefing has since been used in many different circumstances: police officers involved in shooting incidents, rape victims, traffic accident victims, medical students whose patients have died, rescue workers involved in natural disasters, drivers of trains who have witnessed people jumping under their trains, and many other tragic incidents. The question is - does the use of psychological debriefings reduce the chance of PTSD occurring?

To answer this question, researchers examined the results of nine comparable studies conducted across five countries (United Kingdom, Ireland, Netherlands, Austria, and the United States). In each study, individuals age 16 and above who were exposed to a traumatic incident no more than 4 weeks before the single session psychological debriefing (relaxing of the trauma and the emotional reactions that followed) - some interventions were immediate (less than 10 hours after the traumatic event) and others were delayed (more than 48 hours). The studies measured rates of PTSD, general psychological distress, depression, and anxiety among all participants. The researchers measured the impacts of these debriefings in three ways:

1. Compared to a control group, which did not receive any debriefings following a traumatic event.
2. Compared to an educational intervention, which teaches people how to cope with their distress after a traumatic event.
3. Compared the timing of the debriefing (immediate vs. delayed).

The strength of this study is that it allows researchers to measure the effectiveness of psychological debriefings on many different individuals on an international scale.

The results of this study are quite startling and raise serious questions about the effectiveness of debriefings as a tool for reducing psychological stress. After analyzing the results from the different studies, the researchers concluded that there is absolutely no evidence to support that single session debriefing prevents the risk of developing PTSD or reduces psychological distress, depression, and anxiety. Researchers found that debriefing is either equivalent to, or worse than, control or educational interventions. Evidence from two of the longest studies, that followed up with participants for three years after their debriefing, suggest that debriefings might actually increase the risk of PTSD and depression. Researchers found that for those who are at the most risk for developing PTSD, it is unlikely they will benefit ed by debriefings, and instead they could actually cause more harm. The degree of harm that debriefing can cause is still unknown.

Social scientists speculate that there could be a variety of reasons for the failure of debriefing treatment: ranging from the length and timing of the debriefing, to broader, cultural changes in society. The researchers note that the practice of debriefing assumes that there is a predictable pattern of reactions to traumatic events, and that shared time discussion of these incidents is therapeutic. However, the lack of evidence supporting the use of psychological debriefings clearly shows that it is not a therapeutic treatment in many cases, as individuals cope with trauma differently.

The researchers identify the following problems with the use of debriefings: Discussing a recent traumatic event can cause a “secondary trauma,” which typically worsens psychological distress by vividly re-living the incident. Debriefings may produce psychological distress in those who otherwise would not have developed severe distress just by their increased awareness of it.

Focusing on a single traumatic event may divert attention away from other important factors that differ between each individual trauma victim. The researchers conclude that other models, such as the use of “screen and treat” programs, may offer better alternative approaches to effectively prevent PTSD and reduce psychological distress, although these other models need to be evaluated as well.

Takeaways

Debriefing is a psychological treatment intended to reduce the distress that arises after exposure to traumatic events, and to prevent the development of Post-Traumatic Stress Disorder (PTSD) or other psychiatric disorders from occurring.

The strength of this study is that it allows researchers to measure the effectiveness of psychological debriefings on many different individuals on an international scale.

Psychological debriefing is either equivalent to, or worse than, control or educational interventions in preventing and reducing the severity of PTSD, general psychological distress, depression, and anxiety.

There is absolutely no evidence to support the use of psychological debriefing as an effective treatment for the prevention of PTSD following traumatic events. Debriefing of trauma victims cannot be recommended in either the military or civilian life and should cease.

References:

Distinguished Police Scientist Award

This annual award recognizes a member of the ANZSEBP who is an innovative law enforcement practitioner who is central to the implementation of a high-quality program of work that advances Evidence Based Policing in their agency. These leaders of evidence-based policing not only help make high-quality police scholarship possible but also advance significant reforms in policing by utilizing science in their decision making.

• Nominees must be or have been a member of a law enforcement agency, either as a sworn officer or civilian employee; and
• Nominees must have been central to the implementation of a documented rigorous scientific evaluation in their affiliated agency. Such evaluations can be conducted for various interventions, policies, or practices and include a wide variety of outcomes (e.g., crime reduction, improvement in citizen satisfaction, reduction of fear, improvements in police legitimacy, etc.); and
• Nominees must show a record of incorporating and translating evidence-based practices in their agency. These practices may include implementing strategies that have been shown to be effective in reducing and preventing crime or using practices supported by research that address fear of crime, police legitimacy, internal accountability, and other law enforcement concerns. Such a record of practice might also include greater incorporation of science and scientific processes in decision making or training.

Selection decisions are made by the ANZSEBP Management Committee. The Award winner will receive: free registration at the annual SEBP conference, a speaking role at the SEBP conference, an award plaque, free subscription to the Journal of Experimental Criminology for one year, and a published interview about his/her accomplishments to appear in Police Science.

To nominate for this award please complete the Distinguished Police Scientist award nomination form and submit online.

Outstanding Police Experiment Award

This award recognizes a single research project that contributes significantly to evidence-based policing science. To be eligible a study must have been conducted within the last five years.

• Nominees can be individuals or teams.
• The study must be an impact evaluation that assesses the effectiveness of a policing intervention.
• A policing intervention is defined as some kind of a strategy, technique, approach, activity, campaign, training, directive, or funding/organisational change that involves police in some way (other agencies or organisations can be involved). Police involvement is broadly defined as police initiation, development or leadership where police deliver or implement the intervention or where police are recipients of the intervention. We will also consider interventions that are related, focused or targeted to police practices.
• The project must use randomised experimental (e.g., RCTs) and quasi-experimental evaluation designs with a valid comparison group that does not receive the intervention. We will accept designs where the comparison group receives (business-as-usual) policing, no intervention or an alternative intervention (treatment-treatment designs) and quasi-experiments that control the assignment of cases to treatment and control groups (regression discontinuity), match the characteristics of the treatment and control groups (matched control), statistically account for differences between the treatment and control groups (designs using multiple regression analysis), or provide a difference-in-difference analysis (parallel cohorts with pre-test and post-test measures). Single group designs will not be considered. The following designs will be considered:
  – Randomized Controlled Trials
  – Meta-analyses
  – Cross-over designs
  – Regression discontinuity designs
  – Designs using multivariate control (e.g., multiple regression)
  – Matched control group designs with or without pre-intervention baseline measures (propensity or statistically matched)
  – Unmatched control group designs with or without pre-intervention measures which allow for difference-in-difference analyses
  – Short interrupted time-series designs with control group (less than 25 pre- and 25 post-intervention observations)
  – Long interrupted time-series designs with or without a control group (25 pre- and post-intervention observations)
  – Unmatched control group designs without pre-intervention measures where the control group has face validity
  – Raw unadjusted correlational designs where the variation in the level of the intervention is compared to the variation in the level of the outcome
  – Treatment–treatment designs

Selection decisions are made by the SEBP Executive Committee. The Award winner (or winning team) will receive: free registration at the annual SEBP conference, a speaking role at the SEBP conference, an award plaque, free subscription to the Journal of Experimental Criminology for one year, an invitation to publish the project results in Police Science.

To nominate for this award please complete the Outstanding Police Experiment award nomination form and submit online.

Key Dates

Nomination Opens: 1 March 2020
Recipient Notification: 1 July 2020

Alex Murray, Commander, Metropolitan Police, Specialist Crime

Commander Alex Murray graduated from Birmingham University in 1996 and joined West Midlands Police where he worked in CID and uniform roles in the cities of Birmingham, Coventry and Wolverhampton. In 2008, he graduated from Cambridge University, with a Masters degree in Criminology. His thesis developed the understanding of police legitimacy within Muslim communities. He is passionate about involving the community in reducing crime and has led West Midlands Police on preventing violent extremism. He is the founder, and currently Vice Chair, of the Society of Evidence Based Policing and has introduced randomised control trials into West Midlands Police as a means of understanding what works in reducing harm and providing value for money. In 2014, he received the Superintendents award for Excellence in Policing and has been recognised by Mason University’s Centre for Evidence Based Policing. He is a visiting scholar at Cambridge University, has been associate director of the Cambridge Indian Police Service Training Programme and is part of the UK National Disaster Victim Identification Team. Alex now serves with the Metropolitan Police following a transfer there in 2019.

United Kingdom Society of Evidence Based Policing

Guns, Knives & Evidence Based Policing

Violence is the Number One priority for many UK police forces at the moment. There are rises in homicide in the capital and County Lines is a strong focus driver of youth violence (County Lines are when young dealers travel and take over territory in outlying towns away from the bigger cities). There are many retainers in progressive policing at the moment including the impossibility of arresting yourself out of the situation, being_trauma informed contagion, focusing on adverse childhood experiences or adopting a public health approach.

All of this has merit and is ultimately true but if there is one thing we know about policing and police leadership you need clear focus and there is a danger that with a multitude of approaches we suffer mission creep. This is why the UK SEBP conference this year is about ‘Guns and Knives’ the evidence of what works for policing. What is the role of policing within a partnership landscape in the battle against violence and what is the most effective use of our time? I think the answer is as follows but would appreciate starting a debate. For simplicity I believe the evidence points us to three areas in the area of proactivity.

1. Accurate data highlighting the best hot spots. Reliably police them
2. Problem solving. Violence is preventable and clusters, environmental factors are important and deep analysis and action makes a difference
3. Accurate data forecasting which offenders (who are also more likely to be victims) we should focus on. Focus on them using the ‘pulling levers’ approach.

That perhaps seems too simple but then for too long the bias towards novelty has confounded many and diluted our focus. This thought is not about old fashioned policing. If there is one thing the evidence has shown us it is that we do not do what we say we do. Every police leader will say that their organisation does these three things but I can guarantee they don’t do it as well as they could.

Patrol varies according to where the officers want to go (ask the editor, Simon Williams about his experience of hot spot policing). We get the wrong offenders and then pull the wrong levers and finally the implementation of problem solving is notoriously tricky.

That is why in this year’s conference we are amplifying the importance of demonstrating leadership in tracking (or you could call it intrusive leadership. Knowing what your staff are doing and making sure it is right). SEBP UK continues to grow with great regional conferences held in the South East and South West. Our regional coordinators are making a huge difference. The Met Police has a growing movement of evidence based practitioners.

It is running many experiments and has a strong leadership focus on being data driven and applying evidence based practice. We want to do so much more but it is clear to me that evidence based policing is increasingly becoming the bedrock for action in most forward thinking police services.
In 2018 demand for registrations meant we had a waiting list, but registrations for #ANZSEBP2019 far exceeded expectations and really highlight the growing appetite of the policing and law enforcement community across the region to see, hear and share new evidence of what works, what doesn’t and what looks promising to keep our communities safer.

Our decision to move the 2019 conference from the spiritual home of the ANZ SEBP, The Australian Institute of Police Management (AIPM) in Sydney, to a larger venue was one the committee did not take lightly. However, the move to Old Parliament House for this year’s event enabled over 200 colleagues to witness some truly awesome presentations and take away high quality knowledge and insights into the growing evidence based across the region.

Congratulation went to Superintendent David Cowan (Victoria Police, current President of the ANZ SEBP) on becoming the 2019 ANZ SEBP Distinguished Police Scientist. This annual award recognises a member of the ANZSEBP who is an innovative law enforcement practitioner, central to the implementation of a high quality program of work that advances Evidence Based Policing in their agency.

The Outstanding Police Experiment Award for 2019 went to a multidisciplinary team from Queensland Police and The University of Queensland (UQ). This award recognizes a single research project that contributes significantly to policing science, this year’s winner was the project: Developing police-public crime prevention partnerships with IM-PACT. Congratulations go to Senior Sergeant Bruce Peel and Senior Sergeant Darren Green from Queensland Police Service, in partnership with Dr Sarah Bennett from the University of Queensland. This really highlights what can be achieved when academic and police colleagues work together, a real theme of the evidence being presented this year.

The packed conference programme then kicked into full swing with keynotes from Renee Mitchel (Sacramento Police Dept and ASEBP Exec Committee Member), Dr Geoffrey Barnes (Western Australia Police), Professor Gloria Laycock (UCL Jill Dando Institute) and Professor Lorraine Mazerolle (University of Queensland).

Our outgoing President, Assistant Commissioner Debbie (Australian Federal Police) welcomed over 200 delegates on day one at Old Parliament House in Canberra, a truly stunning venue, and began by presenting the society’s annual awards; Distinguished Police Scientist and Outstanding Police Experiment.

The packed conference programme then kicked into full swing with keynotes from Renee Mitchel (Sacramento Police Dept and ASEBP Exec Committee Member), Dr Geoffrey Barnes (Western Australia Police), Professor Gloria Laycock (UCL Jill Dando Institute) and Professor Lorraine Mazerolle (University of Queensland).

These leaders of evidence-based policing not only help make high-quality police scholarship possible but also advance significant reforms in policing by utilising science in their decision making.

The packed Old Parliament House listened on as Professor Gloria Laycock presents on the similarities between Evidence Based Policing, Crime Science and Problem Oriented Policing.

The Outstanding Police Experiment Award for 2019 went to a multidisciplinary team from Queensland Police and The University of Queensland (UQ). This award recognizes a single research project that contributes significantly to policing science, this year’s winner was the project: Developing police-public crime prevention partnerships with IM-PACT. Congratulations go to Senior Sergeant Bruce Peel and Senior Sergeant Darren Green from Queensland Police Service, in partnership with Dr Sarah Bennett from the University of Queensland. This really highlights what can be achieved when academic and police colleagues work together, a real theme of the evidence being presented this year.

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Our keynotes were followed by invited speakers from across the region, with contributions from New Zealand Police, the Australian Institute of Criminology (AIC), Queensland Police, Victoria Police, The Australian Institute of Police Management (AIPM), The Australian Federal Police and Griffith University. The ANZ SEBP Executive Committee would like to formally thank all keynote and invited speakers for their time, energy and commitment in driving an evidence based approach to problem solving, in particular for taking the time to share their stories and applied research with our delegates.
A real highlight of this year’s conference was hearing about evidence-based policing in practice, we were able to hear short shot presentations from twenty police officers, police staff members and academics working in partnership with police across the region.

The standard of applied research happening right across the region is testament to the growing appetite for making better, more informed, evidence-based decisions. The ANZ SEBP Executive Committee would like to formally thank short shot presenters for their significant contribution in building the evidence base and taking the time to share their findings.

Of course, a conference of this size and quality could not have been possible without the leadership of the organising committee. A special thanks goes to Anthony Morgan from the AIC, who chaired the committee and was instrumental in co-ordinating with our conference partner, Conference Design. Finally our thanks also go to the staff and management of Old Parliament House who provided both a warm and friendly service at an exceptional venue.

On a final note the ANZ SEBP now has a new President, Superintendent David Cowan from Victoria Police. The committee would like to place on record its thanks to Assistant Commissioner Debbie Platz for her leadership, commitment and unwavering support in continuing to advocate for evidence to inform police and law enforcement decision making. Debbie remains on the executive committee as the representative for The Australian Federal Police.

The ANZ SEBP Executive Committee look forward to welcoming you to #ANZSEBP2020, our next conference will be hosted by Vodafone NZ in Auckland, New Zealand between the 5th and 7th August 2020. Registrations will open soon at https://www.anzsebpconference.com.au/.

A majority of presentation resources from #ANZSEBP2019 are now available at www.anzsebp.com

Follow us at @anzsebp or go to www.anzsebp.com for latest news and updates.
One in three Australians have a home loan, yet the home loan process continues to baffle us – and that can mean missing out on valuable savings. The last six months have delivered remarkable changes to the home loan market. Towards the end of 2018, the Reserve Bank of Australia (RBA) was hinting that rates were likely to climb higher. The space of just a few months saw a complete turnaround. Interest rates have plunged, led by back to back rate cuts from the RBA in June, July and October. Yet home owners could be missing out on the savings of lower rates, spooked by concerns about a complex home loan process. Research by Aussie showed that 69 per cent of homeowners admit they should review their refinancing options, but it all just seems too hard.

Solving the mortgage mystery
New research commissioned by Aussie confirms that Australians generally view the home loan process with trepidation. An overwhelming 70% of Australians describe the home loan process negatively, citing it as stressful, a waiting game, difficult, painstaking and rigid. Surprisingly, it’s not just first home buyers that are confused. Three out of five (58%) experienced home buyers, are still not sure what documents banks assess during the home loan application process. The result is that many home owners could be paying a home loan rate that’s higher than necessary.

The conditions are all in home owners’ favour
Undoubtedly, the home loan application process has become more complex. But fears of a complicated home loan process shouldn’t force home owners to stick with a mortgage charging an over the top rate. As John Symond Chairman of Aussie, explains, “Today’s property market has all the right conditions: we’ve got low interest rates and national average auction clearance rates are around 70%. However, Aussies could be missing out on this opportunity because they’re overwhelmed or confused by the home loan process.” No matter whether you’re looking to cut your home loan costs, or you want to take advantage of a property market on the upswing to upgrade to your next home, there is a solution. The advice and support of a mortgage broker can streamline the increasingly complicated home loan process. As a home loan expert, a broker offers up to date information. And that matters.

Mortgage myths abound
Aussie’s research found that 87% of people believe it is important to know that someone is across all the current regulations, procedures and processes. The problem, is that we often get conflicting (and incorrect) messages from well-meaning friends and family – who in many cases are fueling mortgage myths. The Aussie survey found two-thirds of Australians have received home loan advice from someone, whether they wanted it or not. And some of the myths that abound are extraordinary.

Close to one in two of Aussie’s respondents believe that tax returns are application criteria (they’re not). One in 10 think medical history is checked by lenders when assessing a loan (it isn’t). Some even believed “women are high risk for home loans because they tend to get pregnant” (myth busted). In contrast, 84% of Australians said they believed there are significant benefits to working with industry professionals.

Navigate the mumbo jumbo
A mortgage broker isn’t just across the constant change in regulations and lender policies. As Symond notes, “A broker can help guide you through the application process to minimise and explain the jargon, paperwork and ‘mortgage mumbo jumbo’, which adds unnecessary confusion to the average Aussie.” The bottom line is that two-thirds of Australians believe that mortgage brokers make getting a home loan easier. To add to the appeal, an Aussie Broker’s service comes at no cost to home owners. As interest rates continue to fall to new record lows, no Australian home owner should be missing out on the savings. Contact Aussie to discover how easy it can be to switch to a more competitive loan or lender, and start pocketing the savings of lower repayments. To make a free appointment with an Aussie Broker, visit aussie.com.au.

Clear evidence:
Home loan confusion is costing Aussies

Australia & New Zealand Society of Evidence Based Policing

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Police department are widely tasked with the management of a child protection/ex-offender registry for the protection of the community. New Zealand and Australia are no different. While the former manages operations across the country, Queensland has its own register in every state, connected federally (to varying degrees) by the National Child Offender System (NCORS) database. Along with the responsibility for maintaining up-to-date information on sex offenders (RSOs), there are ongoing public expectations that officers are appropriately monitored, and their offending disrupted. That is despite the fact, that police are seldom allocated additional operational resources to cope with this important demand.

In the state of Victoria, Australia the state police force has committed significant effort and resources to implement an evidence-based offender management framework. Its aim is to assist police to identify, amongst thousands of sex offenders, those who pose the highest risk to the community. The evidence it relies upon derives from the sex offender research literature which has identified a range of robust risk factors, signalling both long term likelihood and imminent potential to reoffend. These factors have been combined into actuarial tools (e.g. Static 99, Hanson and Harris, 2003) which are established for their predictive accuracy over the long term. Risk is also analysed with dynamic risk assessment tools, designed to identify short-term risk. In establishing its offender management framework, Victoria Police has invested in training staff to utilise actuarial tools and has developed a dynamic risk assessment tool (SHARP) designed to optimise the use of data available to police to derive the risk score (Lopez, Boer, Kirby & Davis, 2019). Internal analysis of risk assessment efforts indicate that a large proportion of offenders (87%) who have committed a further serious offence while registered were assessed as posing a high risk. However, appropriately identifying high risk sex offenders is insufficient when the objective is to protect the community.

In an effort to improve its impact on offenders with an ongoing propensity to reoffend, in 2018, Victoria Police funded a number of specialist, operational resources to proactively manage their risk. There is a team allocated to each police region with the task of assisting the local case manager to proactively engage with high-risk RSOs. To identify offenders, the team has the capability and agility to investigate a range of offenders, but this requires currency in intelligence and risk assessment holdings. The limited number of staff members working on assessing and re-assessing risk makes it impracticable to reassess offenders on the registers every year, let alone every few weeks or months.

Victoria Police is not alone in attempts to utilise advanced data analytics techniques, though the use of artificial intelligence to guide offender management work is arguably ground breaking. For example, Queensland Police Service are developing Harm Evaluation Management System (HEMS) which is designed to identify and rank offender based on their own potential for committing significant harmful outcomes. The HEMS view risk in totality and not on the probability of event. It takes a series of known factors, applies a series of algorithms and weightings to the data using validated forensic predictors and agreed upon definitions of risk and harm of offending. The resulting HEMS output is a list of offenders with potential for committing harmful offences to those who have no identifiable data indicating a history of or factors associated with harmful outcomes at the time Queensland Police Service assessed.

In the UK, Kent Police in partnership with the Cambridge Centre for Evidence-Based Policing has developed the Evidence-Based Investigation Triage (EBIT) system. This enables police to conduct a more effective and efficient resource prioritisation and allocation without sacrificing legitimacy. EBIT achieves this by calculating the likelihood that a case will result in a judicial outcome, incorporating a public interest assessment that identifies victim vulnerabilities and offender propensities. Over its application to 15,000 cases thus far, the number of cases requiring a secondary police investigation have halved while maintaining the same level of successful judicial outcome (World Class Policing, 2019).

Victoria Police has developed the SOR (Sex Offender Registry) Priority Persons of Interest (SPPI) Tool in order to expedite the identification of the highest risk offenders on the sex offender register. It assists operational police to identify offenders most likely to reoffend sexually within the next 12 months who may therefore require disruption, intervention or proactive investigation. This is a crucial advantage to make the best use of limited proactive police resources dedicated to protecting the community from further sexual harm.

Methodology

To identify sex offenders that are most likely to commit further sexual offences in the next 12 months, Supervised Machine Learning was utilised and trained on a large dataset that consisted of nearly 50 predictive features found through research and Subject Matter Expertise. The following is a list of some of the common predictive features found to be predictive.

- **Sex Offence History**
  - Time on SOR
  - Offence count
  - Most recent offence
  - First, second or third
  - Sex offender victim
  - Child victims
  - Male victims

- **Demographic**
  - Age
  - Housing Stability
  - # addresses
  - # moves
  - Most recent move

- **Criminal History**
  - Non-sex related CSI
  - Attendance register
  - Offences hearings
  - Bail

- **FV Related**
  - ARA
  - Other Parts
  - GOOs
  - COs

- **Breaches**
  - Quantity
  - Frequency

- **LEAP data**
  - Field contacts
  - Missing persons
  - Substantiation
  - Warning saga

Given the vast majority of RSOs are adult males, registered offenders outside of these parameters were excluded from the cohort (e.g. juveniles, females). Subsequent predictive features were extracted from a ten-year period (2006–2015) that was sourced from Victoria Police’s System Law Enforcement Assistance Program (LEAP).

Several Machine Learning algorithms were trialled on the training data including Logistic Regression, Random Forests and Gradient Boosting. As Machine Learning methods are more computationally complex models that require the right software/hardware Python was used however they are far superior at learning non-linear patterns in the data and are good at learning predictive patterns in the data.

A process called cross-validation was used to determine the best model in which for case this data was the Random Forest algorithm. The Random Forest algorithm uses tree based methods to make predictions. Decision Trees are as easily as they can be transformed into pseudo-code. This pseudo-code was ported over to a SAS Enterprise Program and turned into a program known as the end user, Sex Offender Registry Staff with the ability to deploy the Machine Learning process as needed. As the Pseudo-code is static, the Random Forest algorithm will need to be retrained to keep it contemporary and adapting new data as it arises.

The main purpose of prediction in this case is for prioritisation purposes. There are ongoing output from the SAS program lists/ranks Registered Sex Offenders (RSO’s) from highest likelihood to lowest likelihood of reoffending over the next 12 months. This is done to ensure resources are focussed on RSOs posing the highest risk to community safety.

**Analysis**

The SPPI tool ranks a large cohort of offenders, only some of whom are of immediate concern to police mitigating risk in the community. Although the tool ranks all offenders who are recorded as RSOs on the primary Victoria Police database, only around 60% of these offenders are managed in the Community at any given time. The remainder reside in other jurisdictions or are incarcerated. Additionally, the rankings assigned to offenders who are being managed in the community require further refinement to make them useful in practice. The SOR maintains or has access to a variety of other databases that are unchangeable within the SOR database. To this end, SOR Analysts created a Visual Basic (VBA)-enabled Excel workbook that combines the SPPI output with the following data sets:

- An SPPI Rank denoting relative likelihood of reoffending from highest to lowest.
- A Risk (High, Medium or Low) as assessed by SOR’s Offender Management Team (based on the Static-99 and SHARP assessment tools).
- Offence Category (CEM, other non-contact offending, contact offending or combinations thereof depending on the offender’s history).
- The number of Information Reports involving the offender in the current calendar year and whether any potential breaches of the Sex Offenders Registration Act (Mc) (2004) were identified in these.
- Current Compliance Manager and Division responsible for the offender’s management.
- Whether the offender has been previously investigated by the Child Management Division’s (CMD) Proactive Targeting Team, the result of any investigation and when this occurred.
- Whether the offender has ever been previously considered at a divisional Tasking and Coordination meeting and the outcome of the tasking and coordination process.
- Whether the offender is subject to the Serious Offenders Act (2018) the most restrictive community supervision scheme in the state for this cohort.

Enriching the SPPI data in this manner allows stakeholders, primarily investigators and Registry staff, to more easily assess the risk posed in conjunction with the level of potential harm associated with each offender and any outstanding opportunities for police intervention. Enriching SPPI SOR data with the introduction of meetings and processes, primarily the OMD Tasking and Coordination meeting.

The data is used both to define a cohort for discussion, as well as to contextualise offenders raised via other avenues (e.g. current intelligence, concerns of managing investigations). SPPI data feeds into Proposed Prisoner Release data to identify any offenders re-entering the community who may require additional management. The tool also assists the officer to make a more immediate response to high risk offenders exiting custody.

In the future, enriched SPPI data may form a basis for regional Compliance Managers to prioritise the RSOs they are responsible for managing in the community – both to help them rank problematic offenders, or to raise awareness of seemingly compliant offenders who are nevertheless highly ranked by the SPPI Tool. Ultimately, these activities increase opportunities to proactively investigate and identify risk.

**Conclusion**

It is broadly documented that AI has the potential for automating the collection and connection of information and intelligence to optimise police situational awareness, to deliver faster responses, with reduced errors between larger sets of data than what can be carried out by people, thus facilitating a more efficient, informed police response (Kemedy, 2019). The output of such processes still requires human guidance to ensure ethical and meaningful police action. As such, policing agencies, which deal in highly complex environments, are justified to proceed with caution.

The SPPI, employing machine learning has already demonstrated utility in providing additional settings to go proactive investigations, specialist police resources tasked with preventing sexual reoffending by registered persons. It is clear that the role of AI is complimentary to the individual analysis undertaken by teams with expertise in sex offender assessment and management. That is, it is unrealistic to know that someone is prone to reoffending, you must consider the harm they stand to inflict and the potential for police to intervene. Police work around a range of child protection services, reintegration services which need support, not disruption. Successful outcomes for the community involved the ultimate reduction of reoffending, which includes appropriate offender reintegration and an effective police response to monitor their progress through the process. Despite the SPPI’s promise, work is ongoing to ensure its efficacy and defensibility as evidence-based police practice. Work will soon be undertaken to validate the Tool’s output by comparing those who it predicts have a higher risk of reoffending against those who went on to commit further offences. Although given that intervention and disruption activities have been deployed, offenses prevented cannot be measured. There is also ongoing potential to increase the data set by incorporating information from the national database, with the aim of further enhancing prediction. Naturally the evolution of the tool and rigour in its application warrants ongoing attention, which remains an operational imperative for Victoria Police.

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Craig Darragh

Ashley Phyland and Mr Tony Christie.
Introduction

Why do OMCGs join and leave gangs? This is the question that prompted our research into OMCGs, which is being conducted in partnership with the QPS Organised Crime Gangs Group and the Queensland Institute of Criminology (AIC). Law enforcement agencies have traditionally measured success in combating OMCGs through quantifying the outcomes of targeting activities such as arrests, charges, court sentencing, assets seized and forfeitures. However, countries like Australia are increasingly recognising the promising outcomes from programs such as those operating in Scandinavia. More specifically, the focus is on leaving criminal gang influence and the development of pro-social behaviours (Pyrooz, Weltman & Sanchez, 2019; Raby & Jones, 2017).

The investment into the development of programs for any individual engaged in criminal activities is significant, so it is crucial that these programs are based on the best available evidence to ensure the biggest impact. Existing research which discusses factors why people join gangs largely relates to youth delinquency and shows that factors such as low self-esteem, low educational achievements and belonging to an ethno-cultural background are important determinants that leave criminal gang influence and the development of pro-social behaviours (Higginson et al., 2018; Raby & Jones, 2016). However, research needs to be conducted for individuals who are disengaged from education (Higginson et al., 2018; Raby & Jones, 2016), have poor social skills, are involved in drug use, and have been incarcerated. Therefore, the purpose of this research is to: 1) inform national law enforcement and partner organisations (police, community agencies, OMCG members as complainants, witnesses, and offenders) to conduct the research, 2) evaluate the research with sworn members (who have experience in interacting with OMCG members as complainants, witnesses, and offenders) to conduct the research.

Approach and Considerations

The division of roles for the study included unsworn researchers from the QPS Intelligence Command to design and manage the research with sworn members (who have experience in interacting with OMCG members as complainants, witnesses, and offenders) to conduct the research. An important step was to ensure the research was culturally appropriate and to understand the perspectives of OMCG members as well as the research team. The research process involved the development of research protocols and the design of the research framework to conduct the interviews and ensure cultural sensitivity. The research team included a qualitative researcher, two PhD students, and two PhD researchers. The qualitative researcher (Dr. Winnie Chiu) was responsible for the development of the research protocol and the design of the research framework to conduct the interviews. The two PhD students were responsible for the data collection and analysis, and the two PhD researchers were responsible for the supervision and oversight of the research process.

Initial Findings: Themes

Initial findings reveal that the reasons for leaving OMCGs include evidence-based preventions and interventions to achieve the strongest prevention impact. When designing intervention programs and initiatives to achieve the strongest prevention impact, it is important to understand the local context and environment. Joining and Disaffiliation from OMCGs

As the study is ongoing, preliminary findings indicate that there could be two distinct groups emerging. We can term these as the ‘older’ and the ‘younger’ OMCGs. Some of our older cohort have indicated they joined an OMCG after establishing their lives (qualifications, jobs, businesses) and have wanted to ‘be cool’ and be part of the ‘biker’ and ‘gang’ lifestyle. However, while some individuals have indicated that they are interested in gang-related activities and the thrill of the ‘image’ of a gang member and attraction to crime, the ‘thrill’, and the expectations to contribute to their attractiveness to women. Interestingly, many of the younger cohort also have jobs or businesses and are attracted to being part of a club.

Joining and Disaffiliation from OMCGs

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Selecting Believable Covert Police

Abstract

In Australia and many jurisdictions around the world, police use deception to gain intelligence, to prevent offences from occurring, and to solve crimes. Where deception is used, the risks to the investigation and to the safety of police officers increases, especially for undercover operatives and teams managing informants, as fictitious stories exposed by suspects could lead to retaliation against police. Successful covert operations rely on the believability of police in fictitious roles, yet the effective use of deception in covert fields of policing and criminal interviews remains relatively undersampled in the literature and in everyday practice. Current selection processes for police assigned to these areas do not include tests to identify effective ‘liars’, as standardised, reliable tests do not currently exist. The current research investigates lie- and truth-production ability of three groups (84 university students, 50 Australian police officers-in-training, 53 experienced covert police officers) by exploring their deception and their personality. Importantly results indicate that neither sex nor age are indicators of believable storytelling, as required under organisational aims for harness in selection and cultural change. Further, undesirable traits such as Machiavellianism also have no relationship with either true or lie production. Other results indicate extraversion, social skills, sentimentality and diligence are key to deception success. Implementation of deception capability tests prior to training provides police with an evidence-based, low-cost method of improving operational safety and effectiveness, thereby reducing exposure of covert operations, methodology and assets.

Success for operational police is no longer purely assessed on the number of arrests. Instead the emphasis is on detection, prevention, and disruption as well as prosecution of offences. Criminals have been educated via our courts and media to restrict the amount of evidence they leave behind; they use gloves, they don’t speak on phones or communicate via emails; instead, they meet in person. Therefore, to obtain information or intelligence regarding planned criminal activities, police need insider information, and/or people who can attend face-to-face meetings with criminals.

Undercover operatives, human sources handlers, surveillance officers and witness protection police are all covert officers; that is, law enforcement officers who use assumed identities and cover stories in order to gather intelligence without being identified as being in communication from criminal entities. To be effective, covert officers must be believable in any story they tell, as their own life, and the life of their cover, will depend on it. Covert officers are usually chosen via numerous and rigorous selection tests, yet currently, a non-subjective test of believability or deception ability is not included. This omission represents not only a risk to the covert officer and their police and civilian colleagues, it also represents a risk to organisational reputation and a massive cost to the agency.

Issues regarding methodology

As both lie production and lie detection are assessed by people, to evaluate an ‘effective liar’ from the subjective to the objective, a number of judges need to reach blind consensus. Also, as well as genuinely being a lie, the situation in which the lie is being told needs to be realistic and reflect the real-world application of the research to protect the reliability of the findings; therefore others who are gaining a balance between realistic scenarios where one person is lying to other people, and testing the same story and circumstances with many different lie detectors, may depend on it. Current covert methodologies provide research stability and test-re-test validity; diversity of the participants in sex, age and experience is also required, and the relationship of the participants, whether known or unknown to each other, should be documented.

Another research issue is the motivation and importance of being successful in a lie (Pardo, 2018). A university student participating in research is unlikely to be motivated to succeed, and therefore likely to be indicative of the general policing population from which covert operatives are chosen. However, as the AFP recruits were claimed to be motivated to succeed in their job (whether known or unknown degrees. Results with police recruit participants revealed that the police.

• the ability to lie successfully is not related to the ability to detect lies (additionally the skills were underpinned by different traits);
• production (truth and lie) is not related to sex or age;
• production (truth and lie) is not related to EI or any Dark Triad traits; and
• lie production is associated to traits within the HEXACO domain of Extraversion.

A larger program of research exploring liar believability

The first study used an adapted version of the Game of Deceit (Wright et al., 2012) to compare the deception ability of 84 university students to their personality traits, skills and abilities, as tested by the theories (measure; author) of the Dark Triad (Jonh Dij, Jones & Paulhus, 2014), EI (MISCET; Mayer, Salovey, & Caruso, 2002), Big Five (HEXACO; Lee & Ashton, 2004). The questions used in the original Game of Deceit were not published, therefore the first author developed the questions for this study (see Semrad, Scott-Parker, Paterson, & McCall, 2018) for the 12 questions) based on the research regarding the lie detectors, consisted of 111 university students and members of the general public who watched the video interviews of Group 1 of 84 students, compared to the general public who watched the video interviews of Group 1 which examined more than 200 studies, which identified that there are no reliable deception tests. Simply put; humans cannot accurately detect lies. A university student participating in research is unlikely to be motivated to succeed, and therefore likely to be indicative of the general policing population from which covert operatives are chosen. However, as the AFP recruits were claimed to be motivated to succeed in their job (whether known or unknown.

Using an Evidence-Based Research to Select Effective Covert Office

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This result led to the examination of the opinions of the 53 covert police officers across six opinion questions (Do you like to fly?, Do you have a dog?, Is circumcision child abuse?, Should Australia have a death penalty?, What is your favourite holiday experience?, What is your favourite meal?). While most results were unsurprising, another set of results was of interest, that is, 69% of officers were opposed to capital punishment, which was contrary to not only to police in the United States of America, but also police in the United Kingdom, both of whom support the death penalty (Fielding & Fielding, 1991; Hughes & Robinson, 2013). Even more interesting was the comparison of opinion between AFP covert officers and the university participants, who opposed the death penalty (72%), and the AFP police officers, who supported the death penalty (58%) (an analysis of the opinions and the corresponding personality traits are detailed in Semrad, Scott-Parker, & Nagel, 2019). Conclusion

This larger, multi-year research project examined the personality traits underlying belief and production to establish the basis of believability. Results across three experiments produced consistent results indicating that people high in Honesty-Humility, Extraversion, Emotionality, and Openness to Experience are likely to be more believable than people low in the traits. This testing not only provides face-value as it provides a fair and robust selection test to be added to any current recruitment process, but also impacts on the best-suited officers for the role, thereby supporting organisational objectives of equity and accessibility. Current fiscal and political challenges mean that psychologists and police are required to act efficiently and with caution. The implementation of tests which select officers based on their believability, prior to training and being exposed to covert methodologies, equipment and assets, would provide police with an evidence-based, low-cost method of improving operational safety and effectiveness. Further, the lack of sex-based differences regarding believability has contemporary implications and is vitally important in particular to police forces who are actively seeking to obtain sex-balanced employment opportunities to reflect the community they serve. Future research should expand testing to include other professions requiring believability such as lawyers, military leaders and salespersons. As with testing, greater numbers of participants would strengthen the findings.

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Abstract

Despite efforts by enforcement agencies around the world to curb the growth of the online drug trade taking place via the anonymous ‘darknet’ platform, its use continues to increase. Understanding the ‘underbelly’ of the darknet, drug trade is critical to ensuring that enforcement and prevention efforts are evidence based and thus more likely to be effective. The present paper aimed to add to this understanding by focusing on one of the more tangible aspects of this trade: where the drugs are delivered. We used Police administrative data from two recent operations to investigate the choices made by those suspected of importing drugs into New Zealand from the darknet, focusing on the shipping name and address for delivery. Consistent with rational choice and routine activities explanations of crime location choice, the data revealed a strong preference for home delivery, with a minority of suspects, typically those importing supply level quantities, using addresses and names through which they could not be traced. These key findings are supplemented with other insights into the age, criminal history, and remaining of importers available from the data.

This study makes several novel contributions to the wider literature on cybercrime. It is the first to use police administrative data on imports and transactions, thereby enabling a point of comparison or combination with previous self-report based studies of darknet users, as well as also to further darknet drug importation at the micro geographic (specific address) level, and to set the analysis in the context of environmental crime theories. We also expand on the findings from previous research that relates to theory, and they do not quantify the prevalence or dissimilarity of constituent location choices.

Introduction

The existence of darknet and cybercrime does not appear to have looked into this micro geographic level decision making about importation location choice. First, there are studies describing macro-geographic darknet drug trade patterns, identifying countries to country trading links, and focusing on one of the more tangible aspects of this trade: where the drugs are delivered. We used Police administrative data from two recent operations to investigate the choices made by those suspected of importing drugs via the internet data from two police operations on the locations of the shipping addresses, and the offenders involved, presented an opportunity for research to better understand how and why offenders select the shipping addresses. This understanding could then inform the development of prevention and investigative strategies, in the same way that understanding ‘traditional’ offline offenders’ spatial choices helps target prevention activities and investigations (Brantingham and Brantingham, 1981; Rossmo, 2000).

Previous literature and research questions

The existing literature on darknet and cybercrime does not appear to have looked into this micro geographic level decision making about importation location choice. First, there are studies describing macro-geographic darknet drug trade patterns, identifying countries to country trading links, and focusing on one of the more tangible aspects of this trade: where the drugs are delivered. We used Police administrative data from two recent operations on the locations of the shipping addresses, and the offenders involved, presented an opportunity for research to better understand how and why offenders select the shipping addresses. This understanding could then inform the development of prevention and investigative strategies, in the same way that understanding ‘traditional’ offline offenders’ spatial choices helps target prevention activities and investigations (Brantingham and Brantingham, 1981; Rossmo, 2000).

Keywords

Drug importation, darknet, environmental criminology, geographic analysis

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During each operation, police conducted intercepts/transactions, including: home or neighbouring address, family and other associated addresses, criminal profiles of suspects and the consignment addresses were also calculated. Analyses included descriptive statistics and bivariate tests of relationships between import, address/name link and offender variations. The intelligence interview data was thematically analysed using a grounded theory approach (Glaser and Strauss, 2004).

Results

The imports and suspects

There were over 300 imports in each of the operations’ datasets. Suspects were identified for 60% of Op A imports and 88% of Op B imports, resulting in 141 Op A suspects and 47 Op B suspects. As shown in Figure 1, about 70% of Op A suspects had only one import (that we know of from its interception), with 8% per suspect at most. Op B (all darknet) had more imports per suspect, with 4 suspects having over 20.

As Figure 2 illustrates, cannabis was the most frequent drug in the Op A data, usually imported in personal-level quantities (although the threshold for supply is very high). Cannabis was also the most frequent of higher Customs detection rates for cannabis, and the use of more readily accessible cleamnet sites for purchasing cannabis (as apparent from the intelligence interview data).

MDMA was predominant in Op B, partly due to the highest frequency suspect with 70 imports of MDMA, which were almost all supply level. These were comparable proportions per drug type to those reported by surveys of darknet drug purchasers (Barratt et al., 2016a; Carpenter, 2018; Van Buskirk et al., 2016).

Of the suspects, 33% from Op A imported supply quantities, compared to 55% from Op B. Most suspects imported only one drug type (Op A 91%, Op B 66%); more suspects in Op B imported a range of drugs. There were age differences between the two groups with Op A suspects being older (17% under 20, 44% over 30) and Op B suspects younger (32% under 20, 17% over 30).

Figure 1 Number of imports per suspect for each operation

Figure 2 Drug types, and quantities imported, by operation

Consignment name and address choices and associated factors

The vast majority of suspects used either their own address, own name, or both for at least one import. For Op A, 94% (91% of supply/ personal level suspects used and both an address and name they had some link to for at least one import. These proportions were lower in Op B (81%/62%), the darknet importers. The relative proportions of suspects per consignment address and name link type are displayed in Figure 3.

A significantly higher proportion of Op B suppliers used an address which they had no apparent link for at least one import to which they had no link more than likely than those who didn’t (83% vs 46%), \( \chi^2(1, \ N = 47) = 5.12, \ p < 0.05 \). Likewise for names, 82% of those who used an unlinked name had prior offences, compared to 40% of those who never used an unlinked name, \( \chi^2(1, \ N = 47) = 7.87, \ p < 0.01 \). Similarly, those who used a linked address and name were less likely to have prior offences than those who didn’t (45% vs 79%), \( \chi^2(1, \ N = 47) = 4.36, \ p < 0.05 \). These results are not surprising given offending history was related to importation level and importation level was related to choosing locations with no apparent link. To summarise, Op B’s suppliers, who tended to have more prior offences, exhibited a higher degree of precaution in their location and name choices. Critically though, the majority still had some link to either the name or address for at least one import.

Calculating the distances between consignment addresses and suspects’ addresses (home or other associated address) painted a consistent picture. Given the dominance of home as the choice of delivery location, there were very few instances where home wasn’t the closest address to the consignment location.

This means there was no ‘buffer zone’ of fewer offences close to home as seen for other types of crime (Rossmo, 2000). As displayed in Figure 4, Op B suppliers were more likely to have used consignment addresses at least a small distance from home than personal level importers. Figure 4 excludes three outliers with distances above 100 kilometres; in those cases the consignment addresses were co-offender’s or family’s homes.

Figure 4 Frequency of furthest distance between home and shipping address, by drug quantity and operation

Other choices involved in darknet drug importation

The intelligence interview data provided some additional insights into the choices involved in darknet drug importation.

There were 39 interviews for Op A, and 11 for Op B. Caveats apply given these small numbers and the context in which such interviews take place; the results should be taken with the above in mind and not necessarily representative of all darknet importers.

Thematic analysis of free text responses to the question ‘why online?’, identified decision-making factors relating to effort, risk and reward consistent with rational choice theory. The themes identified, and mentioned in at least two interviews, were:
Although these qualitative insights are based worth the risk of not receiving the product.

A suspects also tended to pay by credit

A suspects used the clearnet, predominantly

reveal.

insight into the decisions of importers,

imports into NZ, this research provides

included whether importers also used the

price, with online being cheaper (by

lack of knowledge of where to access

greater anonymity by comparison to

perceived lower risk of detection and

online

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therefore being further away from home.

had no apparent link, with those addresses

associations between consignment location

'distance decay' pattern consistent with

(Cohen and Felson, 1979) crime pattern

making. In accordance with routine activities

decision to have the drugs delivered to a

and therefore still within the offender’s

home of a co-offender or family member,

means for purchasing drugs continues to

drug marketplaces, their use as an alternative

future interview or survey studies with larger

2016). Poly-drug use, as seen in the Op B

non-darknet drug users, perhaps reflecting

drug purchasers tend to be younger than

cohorts. Surveys have also found that darknet

future drug use decisions. However, serious

challenges are subject to considerations when applying them at the country and individual level. Br J Criminol 56, 21–48.

End Notes

i. The term suspect is used in preference to offender in this research to reflect the fact that although there were some offenders whose gross involvement in the crime, they had not been recorded as an ‘offender’ in the NIA database.

ii. In the handful of cases with multiple suspects

iii. The small sample size was too small for multivariate

iv. Percentages

As already alluded, our results have practical implications for police and other enforcement agencies. Both.IMOs and darknet drug operations are promoting: door knocks at consignment and neighbouring addresses may identify even some level supply offenders. These should be done promptly.

It was apparent from the data that delays between the detection of the imports and the door knock operations meant that in some cases suspects had moved and therefore was not be traced. When offenders cannot be traced through the consignment address or

name, geographic profiling (Rosson, 2003; Rosson and Turoff, 2000) can be used to prioritise searches for suspects and

packages for customs checks. Prevention efforts can also include messaging to those perceived risks, particularly assumptions about online anonymity and the chances of detection.

These recommendations are subject to caveats due to the methodological limitations of this study. First, the two datasets were not random samples but ones of convenience, though contrasting these datasets from different sources provided some

comparative advantage. However, the sample</ref>
Abstract
Since its inception in 1980, the popularity and engagement with State of Origin has grown to become one of the key events on the Australian sporting calendar. The heightened competitive environment associated with the State of Origin series is often accompanied with violent behaviour among fans, when compared to standard rugby league season games. In anticipation of an increase in alcohol consumption, crowd disturbances, reported assaults and emergency department presentations, which are commonly reported nationally and internationally following sporting games, Queensland emergency services typically deploy additional staff on State of Origin game nights. Little research, however, has explored the relationship between State of Origin game nights and trends in violent behaviour (such as assaults and domestic violence) in Queensland. Using police calls for service data and police reported offence data, the presentation explored the effect of game nights on assaults and domestic violence in Queensland, and the influence of game outcomes on policing demands. The findings of which have informed strategic decision-making of police resources on State of Origin game nights.

Introduction
The State of Origin is an annual, best-of-three, National Rugby League (NRL) football series, played between the Australian States of New South Wales (NSW) and Queensland. It is generally played at stadiums in NSW or Queensland’s State Capital, and unlike other NRL games, is typically played on a Wednesday night. Almost 40 years since its inception, it has arguably become one of the largest sport followings in the country (Dmitrov, 2008) and is often accompanied by player and spectator violence and the use of emotive, war-like or militaristic reporting language by media outlets (Hutchins, 1997).

With regards to the relationship between sport and spectator violence, there is a general consensus in international studies supporting a relationship between contact sports and violence (see Abudato, 2015; Card & Dahl, 2011; Kirby, Francis & O’Flaherty, 2014; Ostrowsky, 2014). Across most studies, the consumption of alcohol remains a consistent factor in sport-related violence and as such its effect should be considered in conjunction with the sport-violence nexus. Factors such as use of illicit substances, associating with deviant peers, weather and other social or psychological factors are also believed to contribute to the relationship between sport and violence, making the relationship multifaceted rather than strictly causal (Abudato, 2015; Ostrowsky, 2014; Schules-Balog et al., 2015).

Further, when discussing sport and violence, the culture surrounding team sports such as football is often commented upon (Palmer, 2011; Kirby, Francis & O’Flaherty, 2014; Ostrowsky, 2014). The team creates a focal point around which a community can be built, often becoming part of the individual’s social identity (Ostrowsky, 2014). The state identity associated with the Queensland team in State of Origin may serve to heighten these relationships. This strong team identification is potentially more likely to produce violence directed against an opposing team (Wann, Peterson, Cothan & Dykes, 2003), and as such, losses, particularly unexpected or ‘upset’ losses, are therefore likely to provoke a strong negative and violent reaction (Card & Dahl, 2011).

However, there is substantial variation in the conclusions of studies which explore the relationship between violence and sport, particularly in relation to the effect of the outcome on the likelihood of violence. Examination of three different demographics and contact games with comparable features showed an increase in domestic abuse from upset losses in America (Card & Dahl, 2011), an increase in assaults and domestic and family violence (DFV) regardless of game outcomes in the UK (Kirby et al., 2014), and an increase in emergency department presentations from winning in Geelong, Victoria, Australia (Miller et al., 2012). Reasons for this variation in the literature includes varying importance placed on confounding or contributing factors (Ostrowsky, 2014) and an unwillingness by the public to link DFV with national sports (Abudato, 2015).

Ultimately, the aim of this research is to determine the expected increase in the demands for police in relation to violence on State of Origin nights. Research within Australia has begun to explore the nature of the relationship between State of Origin games and violence. Livingston (2018), for example, analysed recorded incidents of domestic and non-domestic assaults on Wednesday nights across New South Wales, comparing State of Origin game nights and non-game nights between 2012 and 2017. The study found a significant increase in domestic assaults on game nights, as opposed to the surrounding Wednesday nights in which no game occurred. Furthermore, no significant increases in violence were found in Victoria, indicating that the effects identified in NSW were causal. Conversely, using emergency department presentations data from Queensland hospitals, Furyk and colleagues (2012) found a decrease in presentations on State of Origin game nights when compared with non-game nights. While these studies do not consider the impact of game outcomes on violence, these studies do indicate that police demands on State of Origin game nights, and the nature of the relationship between State of Origin and violence, is relatively unknown in the Queensland context.

Present study
The relationship between State of Origin, violence and assaults has not yet been examined using Queensland Police Service (QPS) data. As such, this research will examine the relationship between sport and violence in a Queensland context by exploring whether State of Origin game nights, thus indicating increases in police demand.

Is there a difference in violence based on the following characteristics?
1. What is the relationship between State of Origin Game nights and violent behaviour in Queensland?
2. Which QPS patrol groups does violent behaviours on State of Origin Game nights present?
3. Is there a difference in violence based on the following characteristics?
4. What game characteristics predict violence on State of Origin game nights?

Taking into consideration the current literature on the relationship between violence and sporting events, it is expected that analysis of QPS administrative data will show an increase in violence on State of Origin game nights, thus indicating increases in police demand. However, it is not known what the impact of the game outcome will be.
Methods

For this research, violence was characterised into two main streams, assaults and DFV. Data was extracted from two QPS administrative data systems: the Queensland Police Records and Information Management Exchange (QPRIME), which records incidents/crime data; and the Queensland Computer Aided Dispatch (QCAD) system, which records calls for service data. This data was linked with game outcomes, created from archived news articles on wins, losses, and possibilities identified in each game. The timeframe used for each game was from the more recent of 2015 to 2019, only capturing Wednesday evenings (6:00pm) to Thursday mornings (8:00am) during the months May, June and July across Queensland, reflecting the same timeframes utilised by Livingston (2018), and the months that the State of Origin series is played each year.¹

Results

Relationship between State of Origin and Violent Behaviour

To test if there were significant differences in the number of violent incidents between game nights and non-game nights, several t-tests were performed. The results, displayed in Figure 1, indicated that for both forms of violence there was a significant increase across Queensland’s State of Origin game nights compared to a non-game night. This was evident in both calls for service for police, and in reported incident data. Figure 1 illustrates the average number of violent incidents across Queensland, divided into three time periods: game nights and non-game nights.

Characteristics of Violence

To explore the nature of the violence by offender and offender characteristics on game and non-game nights, several t-tests were performed using data from the QPRIME. The offender and offender characteristics examined included: the involvement of alcohol and other substances, the scene of the violence (private residence or public location, including licensed premises), indigenous status of the offender, and for DFV, the relationship between the respondent and accused. The results of the t-test indicate there were no significant differences between offenders and offender characteristics on game and non-game nights for both assault and DFV reported incidents.

Game Characteristics

Given the focus of this research is on violence and sport, game characteristics, such as game location (home/away), outcomes (Queensland win/loss) and predicted outcomes, were also explored to determine if aspects of the game can predict the increase of violence on a State of Origin game night. The findings of the Ordinary Least Squares (OLS) regressions indicate that there were no significant relationships between any of the game characteristics in predicting assaults and DFV on a State of Origin game night.

Discussion

Understanding the expected demands of police during State of Origin is key to improving responses to such events. The findings demonstrated that regarding the first research question, there was a significant increase in violence on a game night compared to non-game nights.

Regarding the second research question, the findings demonstrated violent behaviour on State of Origin game nights was substantially concentrated in several QPS patrol groups. The concentration of violence in the patrol groups were different for assaults and DFV, and for calls for service and incidents reported. This suggests that calls for service do not reflect police demands alone. We found that, particularly for Mount Isa, there were fewer calls for service for violence incidents reported compared to the number of violence incidents reported, suggesting assaults on State of Origin game nights may be reported after the fact and police need to be cognisant that demand on game nights may not be concentrated to that particular night, but in the days or weeks following as crime is reported and investigated.

Regarding the third research question, the offender and offender characteristics between games nights and non-game nights remained largely the same. There were no significant increases on game nights regarding the number of incidents involving alcohol and substances, the scene of violence, offenders in terms of indigenous status, and for DFV incidents, the respondent and aggrieved relationship. This indicates that the demand for police across Queensland to respond to violence is simply of a greater volume across all types of offences. Finally, regarding the fourth research question, game location and outcomes did not predict calls or service for assault indicating that the level of violence does not vary no matter what the State of Origin results are on the night. Further, discrepancies in the expected game outcome and the actual game outcome (i.e. whether Queensland were predicted to win or lose and vice versa), did not predict calls for service or reported incidents.

Violent Behaviour by QPS Patrol Group

When geographically mapped by patrol group, there were substantial differences identified in the frequency of violent incidents on State of Origin game nights. Of the 51 QPS patrol groups, Brisbane City Central (N = 16), Cairns Metro (N = 9), and Logan (N = 8) patrol groups were the most common areas for calls for service for DFV on a State of Origin game night. However, Mount Isa (N = 12), Cairns Metro (N = 66) and Mackay City Stations (N = 66) patrol groups presented the highest number of reported DFV incidents.

This work adds to the large amount of literature which finds sporting events is correlated with an increase in reported violence. Interestingly, there were no significant differences identified aligning with the findings of Livingston (2018), who using NSW police data found a increase in domestic and non-related assault on State of Origin games nights. However, it is important to note that in the findings of Messner et al. (2002) who using Queensland hospital data found a decrease in emergency department presentations, including for presentations of injury, poisoning and other external causes. Given the discrepancy between the findings of our study which uses Queensland police data and that of Fury and colleagues (2012) who used Queensland hospital data, it could be speculated that police are able to effectively diffuse violence on a State of Origin game night with a decrease in emergency and emergency department presentations, or that the nature of violence on game nights is that it is less likely to inflict injury. However, this is speculative and investigation of the relationship between police and hospital data on State of Origin game nights in Queensland is therefore warranted.

Interestingly, there were no differences between game and non-game nights in terms of the offender and offender characteristics. The finding that violence involving alcohol and substances did not significantly increase on game nights was unexpected, as previous studies identified a positive correlation between sporting events and alcohol, and the impact of alcohol on both assaults and DFV (see Kirby et al., 2014). This work also add to the variations in the findings of other international studies, which report different impacts of game characteristics on assaults and domestic violence. Speculation regarding the failure to find significance for alcohol use in this research, in contrast to many other studies, may be due to a relatively low number of unpredicted losses for Queensland in the dataset. Only one of the 13 games included in the dataset were unpredicted losses. As such, the data does not have enough power to produce any predictive findings for unexpected game outcomes.

Implications for policing

This research has considerable implications for rostering of staff on game nights. Firstly, these results identify a need for greater police resources to respond to violent behaviour on State of Origin game nights. Secondly, the results also identify that demands for police resources to respond to violence which occurred on State of Origin game nights may not be realised until after the night, as crime is reported and requires investigation after the fact. Thirdly, the results identified that the type of violence being responded to on game nights is largely the same as non-game nights. Finally, the results identified that police demands do not vary depending on the results of the game.

Limitations and future research

There are several limitations to undertaking research using administrative data, and this study was no exception. First, the extent of underreporting is not necessarily reported. As such the findings may be underestimating the impact of game characteristics on violence and police demand on game nights. Finally, due to restrictions in the dataset, it was not feasible to examine or control for the offence and offender characteristics when analysing the findings of the research. Future research also needs to be conducted to link the QPRIME and QCAD datasets to identify whether calls for service resulted in recorded incidents. Research that addresses these limitations would provide a more comprehensive understanding of the violence and police demand on game nights.

Acknowledgements

The authors wish to acknowledge the support and assistance from the Queensland Police Service in undertaking this research. The views expressed in this publication are not necessarily those of the Queensland Police Service and any errors of omission or commission are the responsibility of the authors.

End Note

1. While State of Origin games were traditionally held on a Friday night, the 2018 and 2019 series held one game on a Sunday evening. Due to the limited occurrences, Sunday’s results are not provided correspondingly after the dataset and allow for accurate comparisons between game and non-game nights.

References


He, E. F., Fuller, S. L. (2018). One for the Team: Domestic Violence Surrounded and Supported by the Media: Communication by Rugby League Players in Australia, Communication and Sport, 6(5), 41-47.


This article considers the new field of justice (Gill 2014; Vincent 2010). Well-intentioned, has led to miscarriages of suspects. Adoption of this technology has DNA markers, understood not to be health forensic science has used so-called satellite genome than ever before. For decades Technological advances allow forensic broader training and awareness strategies.

Abstract

The ability to predict physical characteristics from DNA presents significant opportunities for forensic science. Giving scientists an ability to make predictions about the donor of genetic material at a crime scene can then give investigators new intelligence leads for cold cases where DNA evidence has not yet identified any person of interest. However, the interpretation of this new form of intelligence requires careful analysis. The responses to an online survey, conducted in 2018–19, were used to examine how actors in the criminal justice system assess and interpret different types of DNA evidence and intelligence. The focus of the survey was investigators, legal practitioners and the general public (as potential jurors). Several statistically significant effects were identified based on occupation and whether an individual had prior exposure to new DNA technology. Monitoring how those involved in interpreting reports from different forms of DNA evidence and intelligence interpret them helps to ensure that decisions are made based on a sound understanding of their capabilities and limitations and may inform broader training and awareness strategies.

Introduction

Technological advances allow forensic scientists to dive deeper into the human genome than ever before. For decades forensic science has used so-called satellite DNA markers, understood not to be health enhancing, to compare crime scene samples to the DNA profiles of suspects, or to undertake searches against DNA databases (Fridelius 2010). This approach sought to balance individual privacy with the needs of law enforcement to use technology to identify suspects. Adoption of this technology has not, however, been without its challenges and misinterpreting DNA evidence, however well-intentioned, has led to miscarriages of justice (Gill 2014; Vincent 2010).

This article considers this new field of forensic DNA phenotyping and how it can inform intelligence products.

Based on a survey of 260 respondents, the article evaluates how different groups interpret and assess these leads, comparing the perception of forensic DNA phenotyping, both test-based and picture-based, with traditional DNA statistical evidence reports. In this study we will demonstrate the potential for DNA intelligence to misdirect investigations and therefore a need for increased training and awareness for law enforcement and the judiciary.

A face from DNA?

New DNA genotyping technologies have allowed forensic scientists to make predictions about the physical characteristics of a donor. Using probabilistic DNA phenotyping, we endeavoured to analyse an item of biological evidence from a crime scene and predict certain traits of the donor (Kayser 2015). Predictions can presently be made for characteristics such as skin, hair and eye colour as well as the donor’s bio-geographical ancestry (Chatantya et al. 2018; Cheung, Gahan & McNevin 2017, 2018). These predictions can be presented in written form or, in some cases using commercial algorithms and forensic artistry, a facial composite can be generated predicting the possible appearance of the genetic donor at a predetermined age (Figure 1).

Investigative significance

Forensic DNA phenotyping is intended as an intelligence lead. Understanding how the various actors engage with different types of DNA evidence and intelligence is critical to developing strategies around the implementation of new technology. Once a suspect has been identified, a DNA sample can generally be obtained from that individual using a buccal swab and the DNA phenotyping, be submitted to the detriment of other viable leads.

• DNA intelligence resulting in an individual being wrongly identified as a suspect based on their physical traits and subjected to privacy-intrusive processes, such as coercively taking a DNA sample.

• Prediction of physical traits or a suspect’s appearance being used as a basis for DNA dragnets (Murphy 2007; Skinner 2018).

• Imprecise or misinterpreted DNA intelligence forming the basis for an application to a judicial officer for issue of a warrant, and the execution of that warrant perhaps causing unintended harm.

• Defence counsel highlighting inconsistencies between a DNA intelligence product and the physical attributes on the defendant’s representation to persuade a jury to put less emphasis on probabilistic-based DNA reports presented as part of a prosecution case.

The presentation of forensic evidence in court has been the subject of analysis and discussion, including detailed consideration of how scientists can accurately convey scientific meaning to non-scientists (Martire 2018; Ribeiro, Tangen & McKimmie 2019). With forensic DNA phenotyping, the importance of the community understanding and interpreting correctly extends far beyond the courtroom.

The readability and complexity of forensic reports, including language, sequencing and format, have all been the subject of academic review (Hoeve et al. 2016). Researchers have also highlighted the difficulty faced by non-scientists in assessing the probative value of forensic evidence (Beidemann & Kotsosig 2018). Interpretation challenges have been recorded using both verbal and numerical scales, with proposed ways of resolving this issue including dual verbal and numerical scales, or textual and numerical representation (Martire, Kemp & Newell 2013). Statements around prediction of physical traits may be even more difficult to understand, especially when an individual must consider the probabilities around several different traits together. Further complicating the issue are occasion of pleiotropic effects, where, for example, pigmentation traits like eye, hair and skin colour all share genetic markers associated with the melanin synthesis pathway. For example, an individual could share one marker may be influenced by another (epistasis) (Ducrest, Koller & Roulin 2008; Palpacz et al. 2014).

The presentation of DNA intelligence through a facial composite is likely to assist in interpretation and understanding, but only if the person receiving the information is also aware of the context and limitations of the information. They are aware a facial composite can only present a single prediction and needs to take account of the mostly highly probabilistic characteristics at each point in its creation.

Methods

Study Significance

This study’s aim is to assess how individuals from different professional backgrounds understand and assess traditional DNA statistical reports, and text- and image-based DNA phenotyping reports.

The current study involved three different groups of individuals, based on their current or immediate past profession. These groups were: (1) police officers and related professionals, (2) legal practitioners and judicial officers, and (3) other individuals, over 18 years of age, who may be potential jurors. The study’s hypothesis is that occupational background and/or previous experience to forensic science may inform an individual’s assessment of the reliability, trustworthiness and influence of those capabilities and in assessing the ability of the capability to narrow a suspect pool.

Study participants were recruited through participants on the social media platform Facebook, as well as through retweeted posts on Twitter. An advertisement was also placed in the Australian Law Society’s monthly newsletter. Participants were invited to undertake an online survey, which collected demographic information (Table 1) and then presented each participant with three scenarios.
A total of 260 responses were received. 25 respondents (9.6%) identified their current or last profession as a legal professional or tribunal/judicial officer, and 47 respondents (18.1%) identified their current or last profession as a police officer or related professional. For responses not drawn from the legal or police professions, the largest groups of respondents were from students and those working in administration, academia or sales.

Of note, respondents were almost exclusively those working in administration, academia or the legal or police professions, the largest professional group being legal professionals (18.1%) identified their current or last profession as a police officer or related professional. For responses not drawn from the legal or police professions, the largest groups of respondents were from students and those working in administration, academia or sales.

The scenarios were chosen to include both more common use of DNA in criminal investigations (Scenario 1) and two different potential applications of new DNA phenotyping technology (Scenario 2 and 3). The scenarios were randomly presented in two orders, either with the DNA evidence statistical report (Scenario 1) presented first, or forensic DNA phenotyping reports presented first (Always Scenario 2 followed by Scenario 3).

Participants were asked the following questions, on a scale of 1 to 10, in relation to each of the three scenarios:

1. How reliable do you think the laboratory report is?
2. To what extent does the laboratory report influence your [investigative] decisions?
3. How much do you trust the laboratory report to correctly identify the [person of interest]?
4. To what extent would this laboratory report narrow the focus of your inquiries?

Participants were then asked to order the three scenarios in terms of, firstly, their reliability and, secondly, how well they understood each report. Participants were asked about whether they had seen each DNA report previously, through their employment, study, in the news media or in works of fiction.

Table 1: Prior exposure to types of DNA evidence and intelligence

<table>
<thead>
<tr>
<th></th>
<th>DNA statistical report</th>
<th>DNA phenotyping text-based report</th>
<th>DNA phenotyping image-based report</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>9 (39.1%)</td>
<td>14 (32.6%)</td>
<td>77 (46.7%)</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>14 (60.9%)</td>
<td>31 (72.1%)</td>
<td>91 (55.2%)</td>
</tr>
</tbody>
</table>

Table 2: Prior exposure to types of DNA evidence and intelligence

<table>
<thead>
<tr>
<th></th>
<th>DNA statistical report</th>
<th>DNA phenotyping text-based report</th>
<th>DNA phenotyping image-based report</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>9 (39.1%)</td>
<td>14 (32.6%)</td>
<td>77 (46.7%)</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>14 (60.9%)</td>
<td>31 (72.1%)</td>
<td>91 (55.2%)</td>
</tr>
</tbody>
</table>

**Results**

Table 1 presents the demographic characteristics of the three groups, including age, gender, country of residence, employment status and education. Table 2 includes participant responses to questions about previous exposure to DNA reports.

**Ordering of scenarios**

The scenarios were randomly presented in two orders:

1. DNA statistical evidence report (Scenario 1) followed by DNA phenotyping text-based report (Scenario 2) and DNA phenotyping image-based report (Scenario 3); or

2. DNA phenotyping text-based report (Scenario 2) followed by DNA phenotyping image-based report (Scenario 3) and the DNA statistical evidence report (Scenario 1).
Differing perception of DNA evidence and intelligence capabilities in criminal investigations

Overall, on scales of 1 to 10, participants rated DNA evidence statistical reports as the most reliable, most influential, most trustworthy, and with the greatest ability to narrow the focus of enquiries compared to the two DNA phenotyping reports (Figure 2 and Table 4).

**Ranking of evidence and intelligence capabilities**

When asked to rank each of the scenarios in order from most reliable to least reliable, 69.9% of respondents ranked the DNA evidence statistical report (Scenario 1) as most reliable, but only 43.9% rated it as easiest to understand. Image-based DNA phenotyping (Scenario 3) was ranked most reliable, but only 43.9% rated it as easiest to understand.

A similar association was observed between declared occupation group and whether respondents rated the DNA evidence statistical report as easiest to understand, $X^2 (2, n = 202) = 12.05, p = .002$. A higher proportion of respondents who were police or related professionals or legal professionals rated DNA evidence statistical reports as the most reliable, or the easiest to understand, compared to the other occupation group.

**Occupational background**

Analysis was undertaken to compare the ratings given for each question, based on the respondent’s declared current, or most recent, occupation (Figure 3).

A Kruskal-Wallis H Test was conducted across occupation groups to predict whether occupation group impacted on the mean. Statistically significant differences were observed in all four questions relating to the DNA statistical evidence report. The differences in the mean between occupation groups are shown in Table 6. Of note, the mean for police officers and related professionals was 1.32 higher than for legal professionals in their assessment of reliability of the DNA statistical evidence report, and 1.32 higher when compared to individuals who declared an occupation other than in legal or policing fields.

**Figure 2**: Mean responses to questions for each scenario by occupation group. Error bars represent standard errors.

**Figure 3**: Individual ratings, by scenario and occupation group, for reliability, influence, trustworthiness and ability to narrow suspects.

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### Table 3: Analysis of ordering of scenarios

<table>
<thead>
<tr>
<th>Criterion</th>
<th>DNA statistical evidence report presented first</th>
<th>Forensic DNA phenotyping reports presented first</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How reliable</td>
<td>Mean</td>
<td>N</td>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.23</td>
<td>130</td>
<td>7.78</td>
<td>123</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>6.64</td>
<td>128</td>
<td>6.43</td>
<td>127</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>6.23</td>
<td>124</td>
<td>6.89</td>
<td>126</td>
</tr>
<tr>
<td>How influential</td>
<td>Mean</td>
<td>N</td>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.71</td>
<td>130</td>
<td>7.89</td>
<td>123</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>6.34</td>
<td>128</td>
<td>6.96</td>
<td>127</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>6.30</td>
<td>124</td>
<td>6.90</td>
<td>126</td>
</tr>
<tr>
<td>How trustworthy</td>
<td>Mean</td>
<td>N</td>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.12</td>
<td>130</td>
<td>7.72</td>
<td>123</td>
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<tr>
<td>DNA phenotyping text-based report</td>
<td>5.62</td>
<td>128</td>
<td>5.57</td>
<td>127</td>
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<tr>
<td>DNA phenotyping image-based report</td>
<td>5.77</td>
<td>124</td>
<td>6.07</td>
<td>126</td>
</tr>
<tr>
<td>Narrow focus of inquiries</td>
<td>Mean</td>
<td>N</td>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.12</td>
<td>130</td>
<td>7.69</td>
<td>122</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>5.13</td>
<td>128</td>
<td>4.97</td>
<td>127</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>5.75</td>
<td>124</td>
<td>5.97</td>
<td>126</td>
</tr>
</tbody>
</table>

*Statistically significant, p < .05

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### Table 4: Mean ratings

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Mean</th>
<th>N</th>
<th>Std. Dev</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>How reliable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.50</td>
<td>253</td>
<td>2.25</td>
<td>1.4</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>6.54</td>
<td>255</td>
<td>1.90</td>
<td>1.2</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>6.46</td>
<td>250</td>
<td>3.20</td>
<td>1.3</td>
</tr>
<tr>
<td>How influential</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.79</td>
<td>253</td>
<td>3.00</td>
<td>1.3</td>
</tr>
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<td>6.20</td>
<td>255</td>
<td>2.06</td>
<td>1.3</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>6.30</td>
<td>250</td>
<td>2.02</td>
<td>1.3</td>
</tr>
<tr>
<td>How trustworthy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.41</td>
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<td>2.15</td>
<td>1.4</td>
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<td>5.59</td>
<td>255</td>
<td>2.29</td>
<td>1.4</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>5.93</td>
<td>250</td>
<td>2.32</td>
<td>1.4</td>
</tr>
<tr>
<td>Narrow focus of inquiries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.40</td>
<td>252</td>
<td>2.35</td>
<td>1.4</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>5.05</td>
<td>255</td>
<td>2.56</td>
<td>1.6</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>5.86</td>
<td>250</td>
<td>2.44</td>
<td>1.5</td>
</tr>
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</table>

### Table 5: Rankings of reliability and ease of understanding by occupation group

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Legal Professionals</th>
<th>Police and related professionals</th>
<th>Other</th>
<th>Prefer not to say occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report ranked as most reliable</td>
<td>N=20</td>
<td>N=37</td>
<td>N=145</td>
<td>N=7</td>
</tr>
<tr>
<td>DNA evidence statistical reports</td>
<td>15 (75.0%)</td>
<td>33 (89.2%)</td>
<td>53 (36.1%)</td>
<td>5 (71.4%)</td>
</tr>
<tr>
<td>DNA phenotyping text-based reports</td>
<td>2 (10.0%)</td>
<td>3 (8.1%)</td>
<td>26 (17.3%)</td>
<td>1 (14.3%)</td>
</tr>
<tr>
<td>DNA phenotyping image-based reports</td>
<td>3 (15.0%)</td>
<td>1 (2.7%)</td>
<td>26 (17.3%)</td>
<td>1 (14.3%)</td>
</tr>
<tr>
<td>Report ranked as easiest to understand</td>
<td>N=17</td>
<td>N=36</td>
<td>N=145</td>
<td>N=7</td>
</tr>
<tr>
<td>DNA evidence statistical reports</td>
<td>9 (52.9%)</td>
<td>25 (69.4%)</td>
<td>55 (37.9%)</td>
<td>1 (14.3%)</td>
</tr>
<tr>
<td>DNA phenotyping text-based reports</td>
<td>5 (29.4%)</td>
<td>9 (25.0%)</td>
<td>58 (40.0%)</td>
<td>4 (28.6%)</td>
</tr>
<tr>
<td>DNA phenotyping image-based reports</td>
<td>5 (29.4%)</td>
<td>2 (5.6%)</td>
<td>32 (22.1%)</td>
<td>2 (28.6%)</td>
</tr>
</tbody>
</table>

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### Table 6: Analysis of ordering of scenarios by occupation group

<table>
<thead>
<tr>
<th>Occupation group</th>
<th>DNA evidence statistical report</th>
<th>DNA phenotyping text-based report</th>
<th>DNA phenotyping image-based report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police or related professionals</td>
<td>15 (75.0%)</td>
<td>2 (10.0%)</td>
<td>3 (15.0%)</td>
</tr>
<tr>
<td>Legal professionals</td>
<td>33 (89.2%)</td>
<td>3 (8.1%)</td>
<td>1 (2.7%)</td>
</tr>
<tr>
<td>Other</td>
<td>53 (36.1%)</td>
<td>26 (17.3%)</td>
<td>26 (17.3%)</td>
</tr>
<tr>
<td>Prefer not to say occupation</td>
<td>5 (71.4%)</td>
<td>1 (14.3%)</td>
<td>1 (14.3%)</td>
</tr>
</tbody>
</table>

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### Notes

- When presented first, DNA evidence statistical reports were ranked as most reliable by 14.8% of respondents, but easiest to understand 69.9%.
- Table 5 shows the highest ranked report presented first. When asked to rank each of the scenarios, participants ranked the DNA evidence statistical report as most reliable, but only 43.9% rated it as easiest to understand.
- Table 6 presents ranks for each criterion by occupation group.
Similar trends were observed across influence, trustworthiness and ability to narrow the focus of an enquiry, for DNA statistical evidence reports.

There was no similar trend observed for either the DNA text-based phenotyping report or the DNA image-based phenotyping report, with means not showing any significant differences across occupation groups.

Prior exposure to DNA reports

A Mann-Whitney U Test was conducted to determine whether prior exposure to different types of reports (whether through employment, study, media or fiction) was associated with the ratings respondents provided to each question (Table 7). There was a statistically significant difference between how respondents with and without prior exposure answered all four questions with respect to DNA evidence reports, with those with prior exposure showing higher ratings of reliability (M = 1.37, p < .001), trustworthiness (M = 1.46, p < .001), and ability to narrow the focus of inquiries (M = 1.17, p < .001) and narrowing the focus of inquiries (M = 2.01, p < .001).

Table 7: Analysis for previous exposure to DNA evidence or intelligence reports

<table>
<thead>
<tr>
<th>Criterion</th>
<th>No prior exposure</th>
<th>Prior exposure</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNA evidence statistical report</td>
<td>6.82 109</td>
<td>8.19 129</td>
<td>404.0</td>
<td>.000*</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>6.83 140</td>
<td>8.12 129</td>
<td>678.65</td>
<td>.000*</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>6.47 135</td>
<td>7.11 109</td>
<td>633.50</td>
<td>.294</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.11 109</td>
<td>8.44 129</td>
<td>4307.0</td>
<td>.000*</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>6.21 140</td>
<td>7.69 97</td>
<td>6648.5</td>
<td>.710</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>6.41 135</td>
<td>7.10 129</td>
<td>6891.5</td>
<td>.395</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>6.80 109</td>
<td>8.12 129</td>
<td>4105.5</td>
<td>.000*</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>5.81 140</td>
<td>6.59 97</td>
<td>6592.6</td>
<td>.710</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>5.99 135</td>
<td>7.10 129</td>
<td>6592.7</td>
<td>.577</td>
</tr>
<tr>
<td>Narrow focus of inquiries</td>
<td>6.79 109</td>
<td>7.96 128</td>
<td>4973.0</td>
<td>.000*</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>6.00 135</td>
<td>5.19 110</td>
<td>6492.0</td>
<td>.550</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>5.88 135</td>
<td>6.14 102</td>
<td>633.65</td>
<td>.308</td>
</tr>
</tbody>
</table>

Table 6: Kruskal-Wallis H Test analysis by occupation group

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Legal Professionals</th>
<th>Police and related professionals</th>
<th>Other</th>
<th>Prefer not to say occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNA evidence statistical report</td>
<td>Mean</td>
<td>N</td>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>How reliable</td>
<td>7.64</td>
<td>25</td>
<td>8.57</td>
<td>47</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>6.72</td>
<td>25</td>
<td>6.45</td>
<td>44</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>6.56</td>
<td>25</td>
<td>6.52</td>
<td>44</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>8.20</td>
<td>25</td>
<td>8.95</td>
<td>47</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>6.32</td>
<td>25</td>
<td>5.91</td>
<td>44</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>6.76</td>
<td>25</td>
<td>5.95</td>
<td>44</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>7.98</td>
<td>25</td>
<td>8.61</td>
<td>47</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>5.80</td>
<td>25</td>
<td>5.52</td>
<td>44</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>5.92</td>
<td>25</td>
<td>5.82</td>
<td>44</td>
</tr>
<tr>
<td>DNA evidence statistical report</td>
<td>8.00</td>
<td>24</td>
<td>8.11</td>
<td>47</td>
</tr>
<tr>
<td>DNA phenotyping text-based report</td>
<td>5.20</td>
<td>25</td>
<td>4.48</td>
<td>44</td>
</tr>
<tr>
<td>DNA phenotyping image-based report</td>
<td>5.56</td>
<td>25</td>
<td>5.43</td>
<td>46</td>
</tr>
</tbody>
</table>

Conclusion

This study observed several statistically significant differences in participant responses to the DNA reports, based on prior exposure and occupation groups.

While the ordering of scenarios also had a statistically significant effect on two questions, trustworthiness and ability to narrow the focus of an enquiry for other questions. Further research may be required to assess whether prior exposure to text or image-based DNA phenotyping reports has a systematic, positive effect on responders’ later assessment of more traditional forms of DNA evidence. As this was only observed in two questions, this study does not allow for an attribution of causation.

Overall, nearly three quarters of respondents rated the DNA statistical evidence report as the most reliable report. But over a third rated the image-based DNA phenotyping report as easiest to understand. A higher proportion of police officers and related professionals rated the DNA statistical report as both most reliable and easiest to understand, but responses from individuals who did not indicate employment in policing or legal professions had a more even distribution, particularly in terms of understanding.

It can be argued that the ability of stakeholders in the criminal justice system—whether investigators, lawyers or potential jurors—to understand different forms of DNA report is critical to effective justice outcomes. As discussed, forensic DNA phenotyping is intended as an input to intelligence, rather than meeting the threshold requirements for admissibility of evidence. Overall, just over 30 per cent of respondents observed either of the DNA intelligence products as more reliable than a DNA statistical evidence report.

A greater understanding of the use of DNA in investigations and in the courts will come as newer technologies are more widely adopted. This study observed some statistically significant differences between occupation groups and in relation to prior exposure to DNA statistical evidence reports. Given these same effects were not observed for phenotyping, and yet a portion of respondents viewed these capabilities as highly reliable, there is an argument to support further training and awareness in this area, as this technology continues to evolve. It is reassuring to see that DNA statistical reports (for identity) are still held as the most reliable form of evidence by all groups as the new capabilities as highly reliable, yet a portion of respondents viewed these capabilities. A police officer who has seen DNA evidence presented in court may increase their ratings for that capability, but forensic DNA phenotyping may be too new to have delivered clear operational outcomes to justify this time.

Individuals who had previously seen DNA evidence statistical reports also tended to provide higher ratings on the 1-10 scale.

Given nearly three quarters of police and related professionals had prior exposure to this type of report, this could help account for the increase in the mean for ratings by this occupation group.

Further study of the impact of forensic DNA phenotyping, and other DNA intelligence capabilities, is also warranted, to assess any impact on investigations, on judicial decision-making, and on court outcomes.

Acknowledgements

Research for the article was supported by an Australian Government Research Training Program Scholarship. The PhD also draws on work funded by the Endeavour Fellowships and Awards, a Department of Education and Training initiative. The authors would like to thank Meredith Hawthness from the Australian Federal Police for her advice and assistance in relation to this project.

References


Australia & New Zealand Society of Evidence Based Policing

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A challenge for policing is selecting and implementing activities that enhance community safety while minimising impact on budget, time or resources. In Queensland, an estimated three million random breath tests (RBT) are conducted annually as part of an extensive strategy to reduce road related harm (Papafotious Owens & Boorman, 2011). This represents a significant investment of resources by the Queensland Police Service (QPS). While these efforts have a clear impact on detecting and deterring drinking driving, road injuries and fatalities (Ferris, Mazrabei, King, Bates, Bennett, & Davaney, 2013), there is great potential to enhance these high volume public encounters to achieve additional community benefits.

Policing research consistently finds that directed and focused policing strategies around a clearly defined crime problem have positive and cost effective impact on crime and disorder (Sherman & Weisburd, 1995; Weisburd & Green, 1995). Research also shows that when police engage with the public in a procedurally just manner, their encounters transform into additional crime control benefits through willing cooperation and compliance with police directives and the law (Murphy, Mazrabei & Bennett, 2013; Jackson, Bradford, Stanko & Hohi, 2012; Tyler, 1990; Tyler & Huo, 2002).

The current research integrated these two interwoven tested theoretical concepts into an operationalised police crime prevention dialogue that promotes awareness and partnerships. The project advances on the foundational Queensland Community Engagement Trial (QCET) that identified that police could impact public perceptions of trust, confidence, satisfaction and willingness to comply with police directives (Mazrabei, Bennett, Andrus & Eiggins, 2012). The research intervention adopted an operationalised oriented dialogue framework as the means by which to transform routine police encounters with the public in a way that made each encounter impactful. The research tested the impact of procedurally just policing encounters during RBTs on individual victimisation and compliance with the law.

Conceptual Framework and Research Aims

The research’s conceptual framework (see Figure 1) advanced two significant bodies of policing research – procedurally just policing (Mazrabei, 2012) and hotspot policing (Eck & Weisburd, 1999; Griffin, 2002; Kochel, 2011) – with a focus on individual and community level outcomes.

The intervention consisted of two core parts:

1. Identify a target crime Message. The crime should be one where there are explicit actions for the public to assist in crime prevention efforts.
2. Create an opportunity to communicate this message to the public with Purpose, Acknowledgement, Crime prevention action and Thanks (PACT).

The PACT encounter (Purpose, Acknowledgement, Crime message and Thanks) captured at components of procedural justice with a crime message that targeted property theft (theft of license plates, theft from car or home theft). The research was built on the idea that making a simple procedurally just PACT with the public could impact public perceptions of trust and confidence with police and foster a willingness to partner with police to prevent crime. Specifically, through increased police legitimacy and crime messaging, this trial aimed to determine whether IM-PACT RBTs lead to:

- reduced property victimisation (e.g., reduced theft of/from motor vehicle and home property),
- reduced offending and traffic violations (e.g. drink driving, speeding, dangerous driving), and
- increased reporting of crime.
as usual control RBTs or the PACT experimental RBTs, with a total of 9,302 driver encounters.

Data Collection and Measures

Researchers from the University of Queensland (UQ) observed all RBT operations and recorded a sample of encounter times to confirm that police were conducting encounters as per the assigned group. Control RBTs. QPS officers communicated a mandated message to drivers to provide a specimen of breath by blowing through a disposable tube into the alcoholimeter, an encounter which lasted for approximately 25 seconds.

Experimental RBTs. Officers were trained to communicate the target crime messages through the PACT dialogue and provide drivers with a postcard containing LOCK reminders (Lock, Out of sight, Contact Police, Keep a look out; See Figure 2). PACT was conducted in addition to the required breath test.

At the conclusion of the RBTs, drivers in both groups were provided with a research information sheet, a survey (online survey option outlined in information sheet), and a reply-paid envelope. The surveys sought feedback regarding perceptions of police (satisfaction with encounter, trust, confidence, opportunity to express views, felt listened to), awareness of target crime, intent to take crime prevention action, and perceptions of police.

Results and Conclusions

The conceptual framework is that a procedurally just PACT will impact on perceptions of trust and confidence in police and in turn facilitate crime prevention and road safety behaviours. Therefore, analysis aimed to first establish perceptions of procedural justice, awareness of crime, and intent to take action.

A total of 1,183 surveys were completed representing a 13% response rate with no significant difference in the return rate between the PACT and control groups.

Perceptions of police: Overall, drivers who had PACT RBTs reported that officers were significantly more trustworthy (p<.048), gave drivers more opportunities to express their views (p<.001), and listened more to the participants (p<.002) than the officers in the control group.

Awareness of crime: Drivers who received a PACT RBT reported significantly higher levels of awareness of crime than the control group (p<.001). This included vehicles number plate theft (p<.001), theft from vehicles (p<.001), and theft from homes (p<.012).

Intentions towards crime prevention: PACT RBT respondents expressed significantly decreased desire to speed again when compared to the control group (p<.005). Additionally, PACT drivers reported significantly higher likelihood of isolating their car (p<.001), securing their home (p<.001), and reporting a crime to the police (p<.001) than the control group.

Attitudes toward partnering with police: PACT drivers reported greater levels of support for partnering with police to reduce theft from vehicles (p<.006), theft of vehicles (p<.019), and theft from homes (p<.042). The total attitudes towards partnering with police was not significantly different across the two groups (p=.10), however, there was significantly greater levels of support for partnering with police in the areas of crime targeted by the intervention (p<.032).

RBT engagements during the controlled conditions took an average of 38 seconds, while encounters during the experimental (PACT) conditions took an average of 77 seconds. The PACT encounters were on average 49 seconds longer than the standard RBT encounters

utilising the PACT message added an average of 39 seconds to each intercept.

The findings show that the QPS and other law enforcement agencies nationally and internationally, would benefit from embedding the IM-PACT model into everyday policing practice. The procedurally just encounters associated with the IM-PACT model in this research intervention led to substantial social benefits for victims, police and justice regarding crime and community safety (Bennett, Mazzerolle, Peel, & Green, 2018).

Future Research

Future longitudinal research will advance the understanding of how the procedurally just PACT message impacted crime prevention behaviour, particularly for the target vehicle and personal property crime.

Without the involvement of the survey, it is assumed that the actual PACT delivery alone would be quicker in normal operating conditions, further establishing the PACT interaction and its minimal impact on resources to gain such multi-objective benefits.
Developing Police Leaders: Does experience in isolated areas build leadership capacity and what role does mentoring play?

Dr Shane Doyle; Associate Professor Olav Muurlink; and Associate Professor Linda Colley (CQUniversity)

Abstract

The scant scholarly attention to how police leaders develop is surprising, given the critical importance of a cadre of capable police leaders to maintain public confidence and deal with challenges in an increasingly complex policing environment. There is some consensus amongst scholars that police acquire most key skills in the field, as opposed to the classroom. Establishing relationships, including mentoring, particularly with superiors, also plays an important role in learning. However, this paper questions how this can occur when leaders are removed to rural and remote postings. Physical isolation, from resources and support networks. Inexperienced officers thrust into unfamiliar isolated environments can benefit from mentoring from officers experienced in such locations.

Police in Queensland produces its own diverse set of challenges, none the least being a state so geographically dispersed. There has been relatively little study of police leadership development in remote areas. Does experience in isolated postings build leadership capacity in police officers? Mentoring, as the other important piece in the leadership development puzzle, has similarly escaped scholarly interest – in terms of how it mediates the process.

The current research, situated in the Queensland Police Service (QPS), presents a case study to address this focus. In-depth interviews were conducted with a highly representative group of 20 commissioned officers, who, when faced with a step pyramid organisation, had managed to successfully navigate a slow and at times arduous climb into senior leadership positions. Officers describe commanding major incidents and how it mediates this experience. Put simply - how does experience in isolated areas build leadership capacity in police officers?

1.1 Introduction

The ‘thin blue line’ is a popular metaphor used to highlight the relatively narrow band of law enforcement officers who stand between chaos and criminality and honest citizenry. No-where is this blue line stretched thinner than in remote and rural communities. In geographically isolated areas, community expectations are not necessarily scaled back commensurate to resources. While other agencies can provide support to police operations in larger provincial or metropolitan areas, here police are often the sole respondent agency – and are required to respond 24-7 (Allen, 2010). The crises they face, the questions they are asked and the decisions they need to make do not magically readjust to the scale of their support networks. Inexperienced officers thrust into unfamiliar isolated environments can benefit from mentoring from officers experienced in such locations.

There is some consensus in the literature that police learn leadership primarily through on-the-job experiences, together with mentorship and formal training (Doyle, 2018; Pearson-Gott & Herrington, 2013; Schafer, 2010; Schafer, 2009). Building ‘social capital’ through trusted relationships (including mentoring), particularly with superiors, has long been recognised as a means of advancing one’s police career (Campbell, 2009; Chen, Deveny, & Doran, 2006). When officers lack suitable mentors, their leadership progression falters (Murphy, 2005) and this lack of mentoring to develop future leaders reflects poorly on the organisation (J. A. Schater, 2009). Traditionally, learning through mentoring has steadily relied upon face to face interactions. However, new forms of technology make it possible for police agencies to increasingly utilise long distance or remote forms of mentoring (Valencia, 2009).

There has been relatively little study of police leadership development in remote areas. Does experience in isolated postings build leadership capacity in police officers? And what role does mentorship play when emerging leaders are removed from the relatively ‘cosy’ police culture of larger regional or metropolitan police stations to physically remote locations. This study addresses these questions, drawing upon interviews conducted with senior police and provides a rare opportunity for those voices to be heard. It explores whether policing in isolated and remote communities builds leadership and the extent to which mentoring mediates this experience. Put simply - how do police build leadership capacity in remote areas?

1.2 Method

The study is based on the Queensland Police Service (QPS). Geographically, Queensland is only the second largest state in Australia, but more than twice the size of Texas (USA). Over half the state’s population of 5 million live outside the state’s capital and it takes 6 hours to travel on a commercial flight from Torres Strait in the state’s far north to police headquarters in Brisbane. This makes Queensland a valuable case study on remote experiences.

The upper echelons of the QPS are represented by commissioned officers who comprise only about 2.5% (or about 300) of the total sworn strength of nearly 12,000 officers. The hierarchy of the QPS is compressed in rural and remote locations, with a single officer often representing the entire cadre of commissioned officers. This research is based on face-to-face interviews with 20 commissioned officers, comprising the ranks of inspector, superintendent and chief superintendent. The 100% response rate together with a systematic stratified sampling method meant that results reflected the population to a greater degree than is common in qualitative research. Respondents have been de-identified and assigned numbers based on rank. Most officers were men whose careers had not just survived, but thrived, with each averaging over three decades in the one organisation. Now in the twilight years of their chosen vocation, officers provided deeply reflective accounts of their lived experiences.
Developing Police Leaders: Does experience in isolated areas build leadership capacity and what role does mentoring play?

1.3 Results

Officers zoned in on challenges confronting rural and occasionally extremely remote postings, which comprised a significant part of their early career trajectory, reliving some trying experiences where their leadership was tried, tested and occasionally broken.

trying experiences where their leadership of their early career trajectory, reliving some postings, which comprised a significant part of their experience. (In: 3).

This is consistent with findings by Crank (2014) in his account: ‘The nature of police work can foster a sense of solidarity, and with Herrington and Colvin (2015) observation that officers adept at dealing with crisis events arrive elevation to higher leadership positions. One officer [in: 3] summed it up: “I think for the first time you realise that you were the meat in the sandwich and not the bread on either end”. However, officers also realised that the community was part of the support matrix: “when you go to a small community … help is a couple of hours away, you … quickly learn to … lead people within a community … That was the biggest lesson” (Crank 2014).” Community is something that evolves out of necessity in remote locations.

References to the value of mentorship were relatively rare in officers’ narratives. Descriptions about the quality of mentoring on offer was “mixed”. The timing of such support was singled out for special attention. Timing, in terms of having mentors “on tap” to assist was considered critical particularly when officers were asked to “step-up” and shoulder greater challenges — a message affirmed in the following comment:

“…if someone is trying to be super professional they’d go, ‘right, here we go, you’re now promoted and thissupervision or someone will be your mentor’. Some people have gone off and had that but there are too many people who have done and done it themselves unless you’ve got some particular guidance (K3).”

Officers highlighted that, during crises, their effectiveness as leaders was often blunted by unrealistic demands from headquarters.

The support as far as that part of it was good…it would have been better to send someone out of my normal role, it probably something they could have done a little bit better, but I didn’t ask for it, so they didn’t do it (In:12).

1.4 Conclusion

The extreme challenges that officers encountered when posted to isolated areas proved effective in developing them as leaders. The breadth and depth of experience acquired in rural and remote areas taught officers’ valuable leadership skills that arguably could not have been acquired in heavily populated areas, particularly in the fledgling stages of their careers.
Optimising parameter selection for predicting Volume Crime using hotspot mapping

Timothy Mashford and Scott Davidson
Geospatial Analysis Unit, Specialist Intelligence Services Division, Intelligence & Covert Support Command, Victoria Police

i. Introduction

The location of crime is not evenly distributed, however it is also not random (Boda Santos, 2013). Rather, some locations seem to attract more crime than others, acting as either ‘crime generators’ or as ‘crime attractors’ (Clarke & Eck, 2016). Hotspot mapping is a widely used technique for identifying areas with a high volume of crime (Chainey & Ratcliffe, 2005). These locations can then be analysed to understand why the hotspots exist, and identify opportunities to reduce crime through various efforts including targeting known offenders, proactive patrols, and other crime prevention activities such as targeted hardening or crime prevention through environmental design (CPTED) (Hall & Papprich, 2014).

There are several methods for identifying crime hotspots, including grid thematic mapping, choropleth shading, spatial ellipses, kernel density estimation (KDE), or local indicators of spatial association (LISA) (Chainey et al., 2008). Of these, KDE is the most widely utilised across policing agencies (Eck et al., 2005). KDE takes a number of parameters, for which intelligence practitioners usually either accept the default values suggested by the software, or may experiment with varying parameter values until they achieve a visually satisfying result (O’Sullivan & Unwin, 2003).

Whilst hotspot maps display concentration of past crimes, they are usually produced in order to predict future events – i.e. the location of past crimes indicates the likely location of future crimes (Kennedy & van Brunschot, 2009). Research by Spencer Chainey (2008, 2013) sought to test the predictive capability of hotspot techniques, including KDE, with results indicating the likely location of future crimes (Kennedy et al., 2010), however the software is often considered cost prohibitive or too complex for widespread use. Therefore the amount of input data is chosen by the analyst before running the KDE software, however the user can still choose the input data used for the analysis. Since KDE is so widely used, it is important that intelligence practitioners are using it correctly in order to best direct limited resources. In particular, we need to know which parameters have the biggest impact on KDE’s predictive capability, and how to determine the optimised values for these parameters.

ii. Kernel Density Estimation

a. KDE parameters

KDE works using the following process:

1. A grid is overlaid on the study area.
2. Each grid cell, a search radius is applied.
3. The points falling within the search radius are identified. Each point contributes a weighted score, depending on its proximity to the centre of the search radius.
4. The weighted scores are summed for each grid cell.
5. The grid cells are shaded according to their total score.

These are a number of parameters which affect the output of KDE. These include:
- Grid cell size
- Bandwidth (search radius size)
- Kernel function (how the points are weighted according to their proximity to the centre of the search radius)
- Thematic ranges (how the values are divided up in order to be shaded)
- The amount of input data (e.g. 1 week, 4 weeks, 12 months)

Of these parameters, cell size, kernel function and thematic ranges primarily affect the look of the output surface, however minor impact on the calculated values.

The choice of bandwidth however strongly affects the resulting cell values in the grid surface (O’Sullivan & Unwin, 2003). Bandwidth size is often auto-suggested by KDE software, however the user can still choose this value based on their requirements. Chainey (2013) demonstrated that bandwidth has an influence on KDE’s predictive capability, finding that smaller bandwidths produced better predictions than larger ones.

The amount of input data is chosen by the analyst before running KDE. This decision may be based on their goal (e.g. target recent or long term crime patterns), or by the availability of the data. Research by Mohler et al. (2011) compared a self-selecting point process (which uses 52 weeks’ data) to prospective hotspotting (which uses 8 weeks’ data), finding that the process provided better predictions.

iii. Methodology

In order to measure the effects of KDE parameters (bandwidth and input time period) on its ability to predict future offences, a process was sought to test a range of combinations and measure the predictive results. This was applied at the Response Zone (RZ) level, which would provide the most practical output for directing resources (e.g. divisional patrol cars). It was run retrospectively for each Monday during the two four-week periods with the results measured for how well it predicted offences over the next 7 days. Southern Metro Region Division 2 (SD2) was chosen as a study area for the research. This division includes 6 response zones (RZ), providing a manageable number of areas in which to calculate the results. SD2 is mostly urban/residential, providing a fairly uniform opportunity backcloth i.e. offences could occur ‘anywhere’. Theft from Motor Vehicles (TFMV) was chosen for the offence type, as it is a volume crime which would provide sufficient data to measure, and it is a crime which can occur in various location types e.g. residential areas, shopping zones, industrial areas. 93% of the TFMV data was able to be geocoded to ‘property’ level, providing sufficient accuracy for measuring the predictive results (Ratcliffe, 2004).

A variety of bandwidths (search radius distance) were selected for testing. Minimum and maximum values were first determined which could be considered practical at the RZ level. The minimum bandwidth tested was 150m, as the geocoding process for the crime data includes correction methodologies which limit the scale at which reliable results can be determined. The maximum bandwidth tested was 1km, as beyond this would result in large areas which could not be effectively covered by a local unit. Intermediate values of 500m and 500m were also selected.

For testing the input time periods, a minimum value of 2 weeks was selected as this represents a common period utilised by intelligence analysts for creating patrol maps. Further increments of 4 weeks, 12 weeks, 26 weeks (6 months), 39 weeks (9 months), and 52 weeks (12 months) were also tested.

A program was written to automate the testing process in GIS software. The result of each test was recorded to a table, so that the results per parameter combination (bandwidth/time period) could be averaged and compared to answer the question: “If these KDE parameters had been run weekly for RZ2 across the Division during 2018, how well would it have predicted the TFMV crime each week?”

iv. Results

The results demonstrated that overall, a longer time period for the input data would produce better predictions. In particular, utilizing only 2 weeks data (which is common practice for intelligence practitioners) generated the worst predictions, particularly when a small bandwidth was applied. This is likely explained by the limited information available when such a short time period is input – the predictions actually ‘maxed out’ at the top 5% of the cells, and selecting further cells produced no further predictions as there was no more information available to do so. The highest predictive results were achieved when 52 weeks of input data was utilised, although similar results were observed once 26 weeks or more data were input.

Regarding the bandwidth (search radius parameter) parameter, the results showed that a smaller value produced better predictions when applied to the longer-term input period (e.g. 52 weeks). This was consistent with Chainey’s research (2013). However, the results further demonstrated that when a limited time period was input (e.g. 2-4 weeks), better predictive results were achieved when a larger bandwidth was applied. This observed result is likely due to the fact that a larger bandwidth will ‘catch’ more points and therefore increase the amount of information available. However once a longer time period is input (e.g. 3-6 months or more), a smaller bandwidth provides better predictions.
It was thought that the observed phenomena where longer time period input data produces better predictions is likely to plateau at some point, for example it is unlikely that using 20 years’ data will produce markedly better predictions, as changes to the landscape over this time (e.g. urban development) would make the results less valid.

It was felt that 12 months’ data would likely maximise predictions as it accounts for seasonal factors, whilst using 2+ years would simply be repeating the same patterns in the data. To verify this, the test process was run for 2, 3, 4 and 5 years’ data, using a fixed bandwidth of 150m. However, the results indicated that the predictions did actually improve as the time period was extended, all the way up to 5 years. This result was unexpected, however it demonstrates the predictive power in long term patterns.

v. Discussion

This study has demonstrated that KDE provides better predictions when longer term input data is utilised, with the results improving all the way up to 5 years’ data input. Whilst the use of such large volumes of data may be impractical for regular usage by intelligence practitioners (especially when manual handling of the data is required), it shows that using a short amount of input data (e.g. 2 weeks) is limited in its ability to predict future crimes. The results also show that a smaller bandwidth is better when using longer input time periods (3 months), however larger bandwidths provide better predictions when using shorter time period (e.g. 2-4 weeks).

Further aspects of KDE could be tested in order to improve on the predictive results. This study showed that longer time period produced better predictions, however it did not consider whether the time elapsed since the event has an impact. For example, the input data (crime events) could be weighted according to how recently they occurred, similar to prospective hotspotting (Johnson et al., 2009) but with a longer focus. Seasonality may also be a factor, so that crimes which occurred 12 months ago could be weighted higher.

It is also acknowledged that while overall predictions are improved by long term data input, this would likely miss short term patterns, such as an active offender targeting an area. These patterns would be ‘drowned out’ by the long term data, and the weekly predicted areas would change very little from week to week – this effect was demonstrated in research by Mohler et al. (2015) which utilised long term data input. Therefore it would be worthwhile examining whether a mix of long term and short term input periods can improve on the overall predictions.

Findings from this research may influence intelligence practitioners in their selection of parameter values (bandwidth and input time period) when running KDE processes. Since the resulting maps are used to direct limited policing resources, it is important that these predicted areas are as accurate as possible in order to deter crime through proactive measures.

Table 1: Optimised bandwidths for varying time input periods

<table>
<thead>
<tr>
<th>Time input period</th>
<th>Optimised bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 weeks</td>
<td>500m</td>
</tr>
<tr>
<td>4 weeks</td>
<td>500m</td>
</tr>
<tr>
<td>12 weeks</td>
<td>300m</td>
</tr>
<tr>
<td>26 weeks</td>
<td>150m</td>
</tr>
<tr>
<td>39 weeks</td>
<td>150m</td>
</tr>
<tr>
<td>52 weeks</td>
<td>150m</td>
</tr>
</tbody>
</table>

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