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Notes for contributors

Articles for consideration should in the first instance be sent to the editorial team at anzsebp@gmail.com 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, anzsebp@gmail.com. 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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Editorial Foreword

Superintendent David Cowan, Victoria Police

Deputy Chief Executive Mark Evans OBE, New Zealand Police

Simon Williams, Director Evidence Based Policing Centre, New Zealand Police

On behalf of the ANZ SEBP Executive Committee, we would like to welcome you to this, the winter edition of Police Science, the official journal of the Australia and New Zealand Society of Evidence.

This edition is being published shortly after our annual conference, or at least Part I of our conference, which has been interrupted by the outbreak of the Delta variant of Covid-19 in New Zealand, the societies host partner this year. We can assure you that the team responsible for producing the conference are working hard, behind the scenes, to bring Part II of the conference to you later in the year.

The ANZ SEBP committee have been overwhelmed by the positive feedback on the style, format and presentation of this year's conference. In particular the way in which the culture and values of New Zealand and New Zealand Police flowed through each segment. We really feel that this year's conference has demonstrated the art of what's possible when strong partnerships are developed. On that note we'd like to thank all those who have or will contribute, including our distinguished speakers, sponsors, the conference organising committee, and partners Conference Design, Kiio and Ellis Anderson.

In his opening address of this year's conference, President of the ANZSEBP Superintendent David Cowan reminded us of the mission of the society; to make evidence based methodology part of everyday policing. This starts with, and is really underpinned by, our professional curiosity which is nicely summed up by the phrase 'nullius in verba' which is the motto of The Royal Society. In other words, we should look to verify everything using the best available evidence we have at our fingertips. This is how professions have developed over time, and our craft, our profession of policing should also be based on the evidence of what works, what doesn't and what looks promising to reduce crime and prevent harm.

With well over 2000 registered delegates for this year's conference, there is a really strong signal that police officers and staff across Australia, New Zealand and the Pacific Islands are up for a conversation around the everyday use of evidence, data and insights to inform better decisions. We have every rank from Constable to Commissioner represented in this number, along with every police agency, both state and federal, across Australia and New Zealand along with our long term partners the AIC, AIPM, and ANZPAA.

The good news is, that it's not too late to register for our conference, if you are a serving police officer or staff member in an ANZ policing jurisdiction, please email mail@conferencedesign.com.au who will check your agencies eligibility, and then provide you with a FREE registration link. This will give you full access to day one presentations and a further two days of content yet to come. This includes all keynote and invited speakers, panel discussions and 50 short-shot presentations, this material really helps us to think about how we might innovate within our own agencies to deliver better policing services to our communities. If you are from a policing jurisdiction, law enforcement agency or academic institution anywhere outside of the ANZ region please contact mail@conferencedesign.com.au to discuss bulk registration options.

When the ANZ SEBP Executive team last met face to face in 2019, we made the decision to seek to appoint and eminent Australian as our inaugural Patron. The decision as to who that would be was unanimous - Air Chief Marshall Sir Angus Houston. Sir Angus has had a very distinguished life and career. He retired as Chief of the Australian Defence Force in 2011 after 41 years of service. In the same year he was named the Australian Father of the Year and in 2012, the ACT Australian of the Year. In 2012 Sir Angus led the Expert Panel on Asylum Seekers. He was Chair of the Anzac Centenary Advisory Board and Chair of Air Services Australia for many years. In 2014, he was appointed as the Prime Minister's Special Envoy to lead Australia's efforts to help recover, identify and repatriate Australians killed in the Malaysia Airlines flight MH17 disaster. Sir Angus also led the Australian Government's work on the search into missing Malaysia Airlines flight MH370 in 2014. Sir Angus was knighted in January 2015 for extraordinary and pre-eminent achievement and merit in service to Australia. The society feel very privileged to appointment Sir Angus as the Patron of the ANZSEBP and wish him well as he supports and guides the society into the future.

For those of you who have already tuned into the conference, you will have seen that each of our speakers were gifted the New Zealand Police Whakatauki, which is a Maori proverb. This was first gifted to New Zealand Police in 1996 by Ngati Porou kaumatua, leader and scholar Dr Apirana Mahuika – or 'Uncle Api' as New Zealanders know him. This proverb says, E tu ki te kei o te waka, kia pakia koe e nga ngaru o te wa – Stand at the stern of the waka (canoe) and feel the spray of the future biting at your face. We hope you reflect on this inspirational proverb and think about how an evidence based policing approach can support you and your colleagues navigate the challenges ahead and make changes for a better, safer future in your own jurisdiction.

Understanding Family Harm: Through the lens of the New Zealand Crime Harm Index

Authors: *by Renee Looc, Priya Devendran & Simon Williams, Evidence Based Policing Centre, New Zealand Police*

Introduction

New Zealand has one of the highest rates of sexual and domestic violence in the developed world, with police responding to a family violence incident every four minutes. Family violence is estimated to cost the country between NZ$4.1bn and $7bn a year (https://www.theguardian.com/world/2020/may/11/new-zealand-domestic-violence-services-to-get-200m-as-lockdown-takes-toll). The prevalence and cost of family harm highlights the pervasive nature of this phenomenon, with implications for individuals and populations. The imperative to address family harm is clear, although more can be done to better target this phenomenon. Research can support this agenda by identifying where and to whom resources should be targeted, enabling an efficient and effective use of resources as it relates to family harm interventions.

To be sure, family harm intervention and prevention strategies have had success when they have been utilised to target the most serious victims and offenders. Yet, there are different ways to define "seriousness", although this has been measured predominantly by observations of crime counts. While the importance of identifying serious victims and offenders based on crime counts cannot be underestimated – a crime count analysis has progressed significantly towards the production of objective evidence relating to different volumes of crime associated especially with predictable and preventable targets, such as repeat offenders, repeat victims and crime hot spots (Dudfield et al. 2017, pg. 40) – a fundamental limitation of this approach is that it assumes all crimes are equal in the harm they cause, a premise "rejected by virtually every known system of criminal sentencing" (Dudfield et al. 2017, pg. 40). Indeed, evidence relating to family harm has consistently shown that there is a disproportionality between crime counts and crime harm – most family harm victims and offenders that are prioritised on volume often cause/experience low-levels of harm (Barnham et al., 2017). There is thus not only a limitation in the fairness of how a crime count approach defines crimes, but as Sherman et al. (2016, pg. 171) assert, there is also the potential for such approach to "foster distortion of risk assessments, resource allocation, and accountability".

There is no doubt therefore that how "seriousness" is defined has implications for how to fairly and effectively allocate resources. To this end, scholars such as Sherman et al. (2016) argue that utilising a harm-based approach (i.e., measuring the severity of harm caused by crime), can overcome the limitations identified above. Appropriately targeting family harm based on this approach would thus not only be an effective use of resources, but might succeed in attaining 'big effects' in the prevention of family harm.

Purpose of research

This research sought to understand family harm offence and incident data from 2016-2020 from a harm-based perspective. Findings from this research aims to support police decision-making about responding to and reducing family harm in New Zealand. This research provides an analysis of overall family harm trends, as well as specific family harm patterns as it relates to victims, offenders, and locations.

Methodology

This study utilised police data from New Zealand Police, over a five year period from 2016-2020. To be included in the analysis, the incident in question had to meet the following criteria: (1) the occurrence had a Family Violence flag (2) was a Family Harm Investigation (an Investigation has been entered using the 5F OnDuty app) or (3) was one of a set of specific codes which relate to family harm (such as 5F or 1545). Table 1 highlights the proportion of cases over the observed 5 year period that met the above specified inclusion criteria.

Table 1: Proportion of cases over 5 years that met inclusion criteria for analysis

	2016	2017	2018	2019	2020
Total FH occurrences	123,837	127,077	137,779	158,350	175,998
Was a FHI	96%	96%	96%	96%	97%
Had FV flag applied	96%	96%	96%	96%	96%

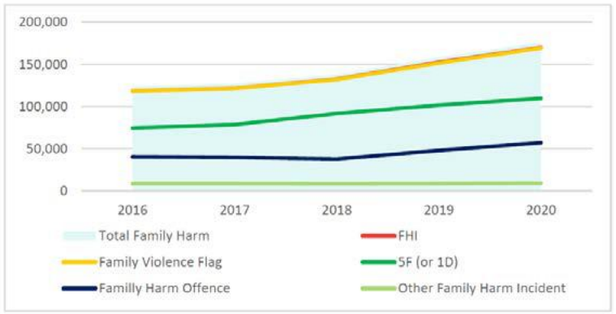
	2016	2017	2018	2019	2020
Was a 5F (or 1D)	60%	62%	67%	64%	62%
Was a FH offence	33%	31%	27%	30%	32%

The New Zealand Crime Harm Index (NZ CHI) was used to measure crime harm for family harm trends, as well as harm patterns relating to victims, offenders, and locations. The NZ CHI provides a weighting for each offence based on a proxy for the relative harm it causes, expressed as an estimation of the minimum number of days in prison a first-time offender would serve for the offence. The higher the value derived, the more harmful crime harm is deemed to be.

Continued on next page

Findings: Overall trends

Family harm demand has been increasing over time. Figure one highlights that reported family harm incidences has increased by an average 11% every year since 2018. It is unclear whether this reflects an increase in actual instances of family, or an increase in recording of family harm due to the easier recording method (launch of the 5F OnDuty app).



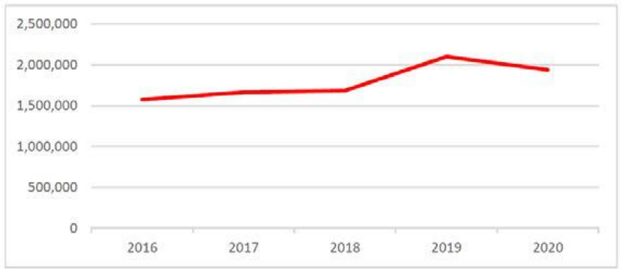


Figure 1: Overall family harm trends

In 2020, harm reduced slightly. Figure two illustrates that whilst the increase in reported family harm incidences coincided with an increase in recorded harm since 2018, in 2020 harm reduced 8% from 2019 (even though volume still increased 11% that year). While the reasons for this cannot be determined without further investigation, a decrease in harm at the same time as an increase in recorded family violence incidents might suggest the following: (1) an increase in lower-harm family violence incidents or (2) victims are experiencing less harmful forms of family violence. More analysis would be needed to determine the cause of the observed data changes in the current context.

Figure 2: crime harm trends from 2016-2020

Findings: People

Victims

A high proportion of harm is attributed to a few victims. Figure 3 illustrates that in 2020, 1.7% of family harm victims suffered 50% of crime harm.

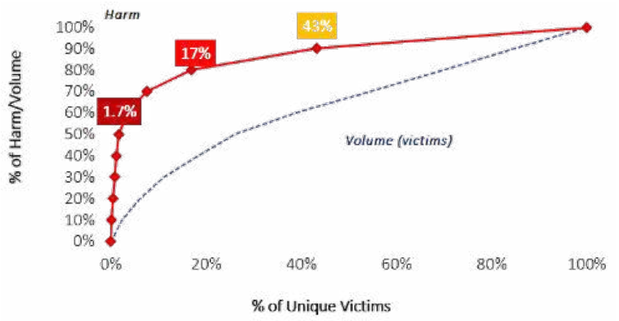


Figure 3: Proportion of harm attributed to victims

Female victims accounted for a larger proportion of harm compared to males. Figure 4 highlights that across all age breakdowns, adult female victims accounted for the largest proportion of harm in all percentile categories. Adult females made up the largest proportion of harm in the upper 25% percentile, compared to the middle and lower percentiles.

Victims in the upper 25% had the largest disparity between its largest crime type by volume, and the harm experienced from it. Figure 5 illustrates that physical assaults accounted for the largest proportion of offences experienced by individuals in the top 25 and 50 percentiles of most harmed individuals, whilst property damage accounted for the largest proportion of offences for those in the lower 25 percentile. Figure 5 also demonstrates that the largest disparity between crime type by volume and harm is observed for victims in the upper 25 percentile. Whilst those in the top 25 percentile experienced the highest percentage of physical assaults, the harm experienced by these individuals from this crime type accounted for only 19% of total harm experienced. Conversely, these victims experienced the most harm from sexual assaults, even though this crime type only accounted for 16% of total crime type by volume.

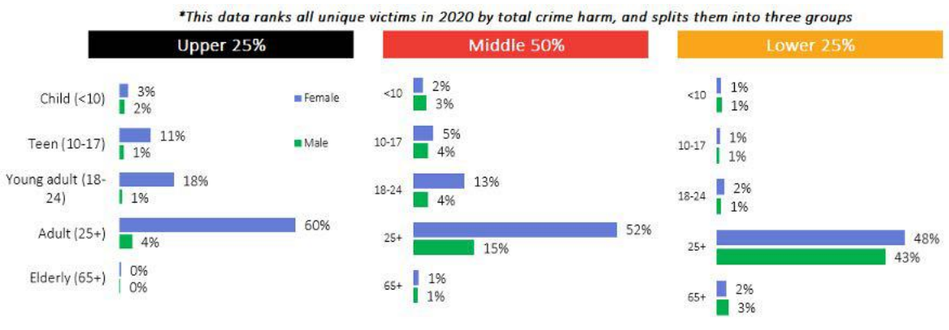


Figure 4: Victimisation harm by gender

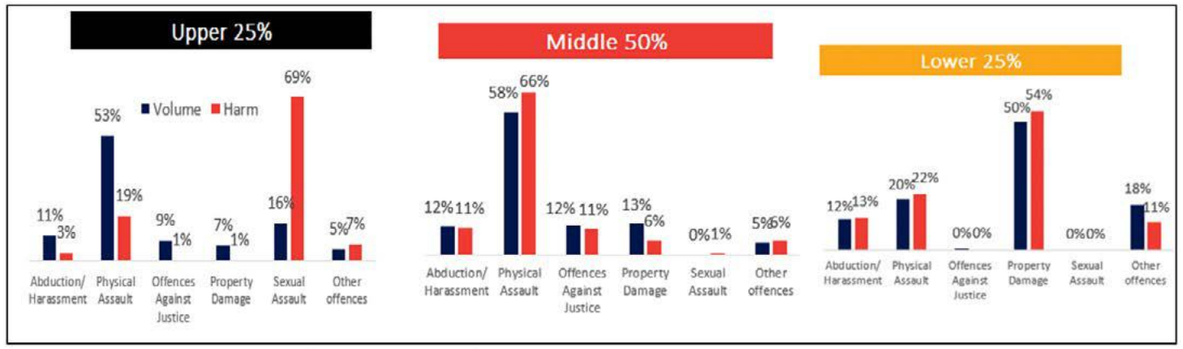


Figure 5: Victimisation crime harm versus volume

The first month poses the highest risk for re-victimisation. Among victims who first reported to Police in 2019, 22% reported a repeat victimisation within a month of their first family harm victimisation, and 40% within a year (figure 6).

Figure 6: Proportion of re-victimisation by month

Offenders

A high proportion of harm is attributed to a few offenders. Figure 7 illustrates that in 2020, 1.7% of family harm offenders committed 50% of crime harm.

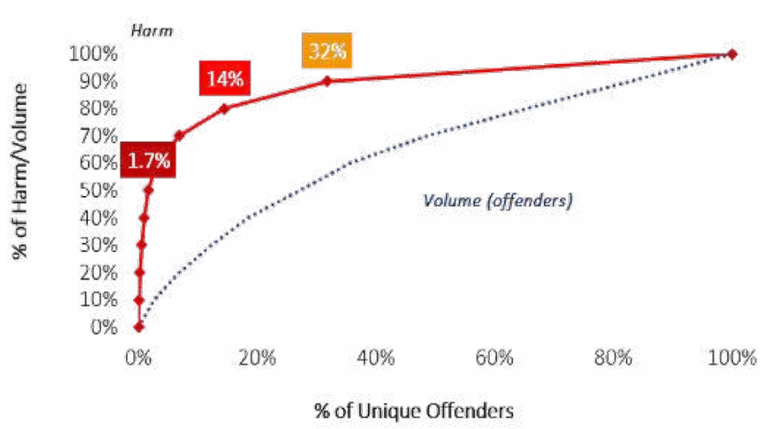


Figure 7: Proportion of harm attributed to offenders

Male offenders accounted for a larger proportion of harm compared to females. Figure 8 highlights that across all age breakdowns, adult males accounted for the largest proportion of harm across all percentile categories. Adult males made up the largest proportion of harm in the upper 25% of most harmful offenders, compared to the middle and lower percentiles.

Figure 8: Offender harm by gender

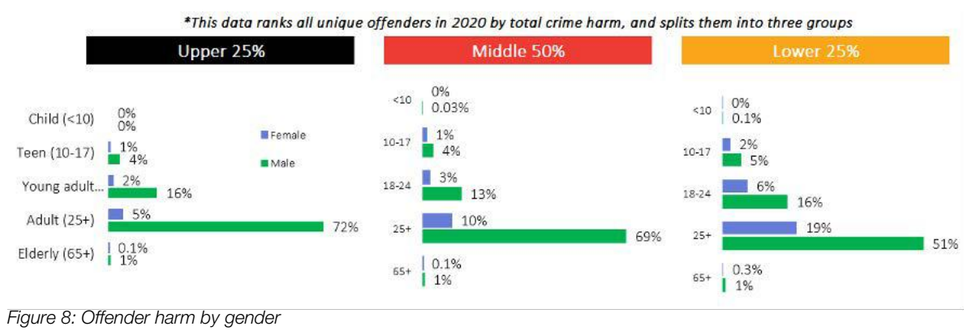


Figure 8: Offender harm by gender

The largest disparity between crime type by volume and crime type by harm is observed for offenders in the upper 25 percentile who committed sexual assault. Figure 9 illustrates that physical assaults accounted for the largest proportion of offences experienced by individuals in the top 25 and 50 percentiles of most harmed

Continued on next page

individuals, whilst property damage accounted for the largest proportion of offences for those in the lower 25 percentile. Figure 9 also demonstrates that the largest disparity between crime type by volume and harm is observed for offenders in the upper 25 percentile. In this group, sexual assault accounted for 6% of crime by volume, but accounted for 39% of total harm, the largest volume versus harm disparity across all percentile groups.

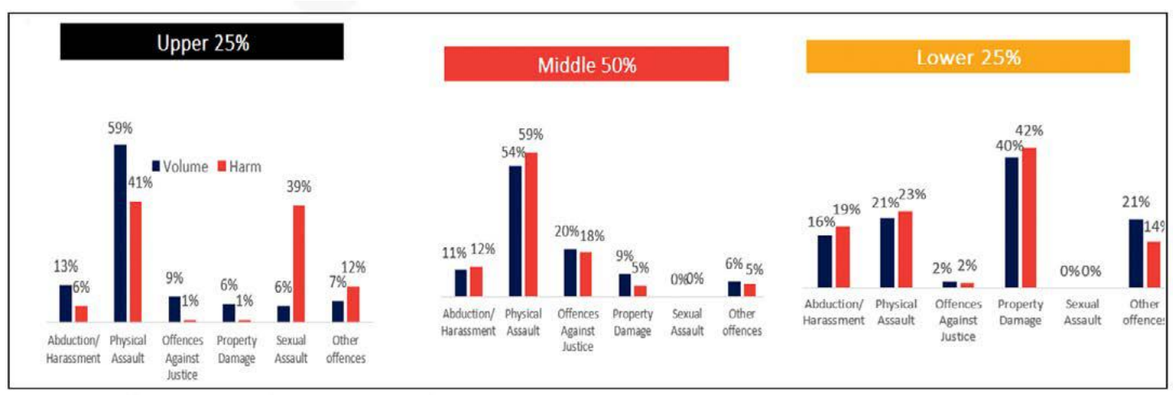


Figure 9: Offender crime harm versus volume

The first month poses the highest risk for re-offending. Among 2019's first-time offenders, 32% re-offended within a month of their first family harm offence, and 45% within a year (figure 10).

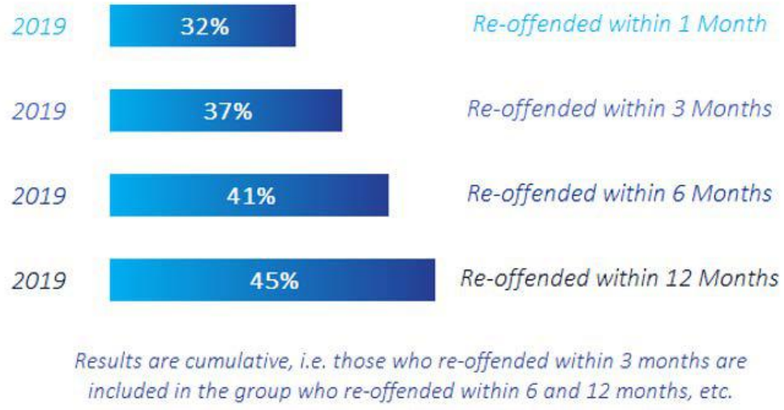


Figure 10: Proportion of re-offending by month

Findings: Places

For every additional 1,000 residents with a station boundary, volume of offences, crime harm and demand all increased 2%.

There are some stations that experience a disproportionate amount of family harm for its population size. Figure 11 indicates that Eastern ranks highest for total crime harm and demand and for total volume of offences, per 100,000 of its population, demonstrating that it experiences a disproportionate amount of family harm for its population size.

Figure 11 (on next page): Crime harm by stations and population size

Ambient population was also associated with family harm. For every 1,000 additional businesses in a station boundary, volume of offences increased 2%, crime harm increased 2%, and demand increased 4%. Non-crime incidents were also more likely to occur in communities with higher ambient populations.

	Harm per 100,000		Family Harm with Offences: Crime Harm		Volume per 100,000		Family Harm with Offences: Volume		Demand per 100,000		Demand (including incidents)	
National	Rank	38,085	Rank	1,936,177	Rank	1,123	Rank	57,083	Rank	3,462	Rank	175,996
Northland	4	48,759	11	90,716	7	1,165	9	2,167	2	5,666	10	10,542
Waitematā	12	20,326	8	131,728	10	588	7	3,811	11	2,249	8	14,572
Auckland City	11	21,477	9	103,654	12	397	11	1,915	10	2,261	9	10,910
Counties/Manukau	2	52,973	1	327,250	4	1,655	1	10,226	4	4,520	1	27,926
Waikato	6	43,792	6	178,874	5	1,504	5	6,142	5	4,382	3	17,897
Bay of Plenty	3	49,339	3	198,684	3	1,687	3	6,795	6	4,196	5	16,896
Eastern	1	62,399	7	143,143	1	2,344	6	5,378	1	6,356	7	14,581
Central	5	47,495	5	184,773	2	1,692	4	6,583	3	4,688	2	18,240
Wellington	7	40,900	2	217,768	6	1,281	2	6,821	7	2,836	6	15,101
Tasman	8	32,904	12	65,074	8	838	12	1,658	8	2,744	12	5,427
Canterbury	9	30,297	4	193,828	11	544	8	3,479	9	2,679	4	17,142
Southern	10	28,788	10	100,686	9	603	10	2,108	12	1,933	11	6,762

Station boundaries with high deprivation, and those with higher inequality, experienced more family harm. For every increase of 1 in average deprivation across a station boundary, the volume of occurrences with a family harm offence increased by 51%, whilst the amount of harm generated increased by 35%. In addition, for every increase of 1 in variation of deprivation within a station boundary, the volume of occurrences with a family harm offence increased by almost 3 fold, and the amount of crime harm generated more than doubled.

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The risk of memory blindness when interviewing witnesses: How eyewitnesses can fail to notice mistakes in their witness statements

Authors: *Hayley Cullen & Celine van Golde*

Acknowledgements: *We would like to acknowledge the contributions of Ruby Brown, Emily Venn, and Viviane Wolf to the empirical work that has been referenced in this article.*

Abstract

The memory of eyewitnesses is a valuable form of evidence within criminal investigations. However, both investigators and eyewitnesses are not exempt from making mistakes that may impede upon the accuracy of witness statements. One such mistake is known as memory blindness. Memory blindness describes the process by which - unintentional or intentional - alterations to witness statements made by investigators can lead witnesses to not notice (i.e., be blind to) such changes, which in turn may distort witnesses' memories for these altered details. Memory blindness holds serious implications for both eyewitness recall memory, and may therefore compromise the criminal investigation. The current paper will discuss recent developments in the research on memory blindness and describe the factors that have so far been identified as impacting upon memory blindness in witnesses. Recommendations as to best practices for avoiding distorted memory during interviews resulting from memory blindness are also provided in light of the current research base.

Introduction

Eyewitness evidence is crucial, but decades of psychological research has highlighted the fallibility of eyewitness memory (see Loftus, 2005, for a review). Issues with eyewitness memory can have a major impact on police investigations, leading to a focus on the wrong suspect or an erroneous line of inquiry. Moreover, eyewitness issues are common contributing factors to wrongful convictions in the United States (Innocence Project, 2021) and Australia (Dioso-Villa, 2015). The quality of the witness interview is one key factor that will influence the accuracy of the witness's testimony, as well as what they will remember later on.

Police procedures for taking witness statements vary widely across countries (Meise & Leue, 2018) and even within Australian states (Tudor-Owen & Scott, 2016). The general practice across Australia and New Zealand is that the officer handwrites or types the statement that the witness verbally provides (Dioso-Villa et al., 2016; Westera, Kebbell & Milne, 2011; Westera, Zajac & Brown, 2016). When collecting statements from a witness, the officer may rephrase the statement or take the statement down using shorthand (Milne & Shaw, 1999). By not gathering witness statements verbatim, some details provided by the witness may be altered unintentionally (Cochran, Greenspan, Bogart & Loftus, 2016).

This could happen when the officer mishears the witness or attempts to fill in the gaps. Research has shown that such a change to the statement could have serious consequences. One consequence is that the witness may not notice these changes in their statement. Failing to notice such changes may lead the witness to endorse or remember these changed details later, such as in a subsequent interview, or when giving testimony in court (see case of Maughan [Bernard], Wood Green Crown Court Indictment No. T98 0680). This phenomenon is known as memory blindness.

Memory blindness

Memory blindness occurs when witnesses fail to notice alterations made to their original statements or reports, affecting their later memory for the altered details (Cochran et al., 2016).

In a typical study of memory blindness, participants view a video of a target event (such as a crime), after which they answer some questions about that event to test their memory. After a delay, they are re-presented with their responses, some of which have been altered by the experimenter. To determine whether participants notice the alterations when presented with them (known as "concurrent detection") participants are asked to read through and sign their statement, similar to what is done when taking witness statements in practice (Cochran et al., 2016). Participants then complete a second memory test (in which they again answer questions), to determine whether their memory responses have changed after exposure to the alterations. At the end of the study, participants are often given another opportunity to state whether they believed some of their responses had been altered (known as "retrospective detection").

The extant research into memory blindness has demonstrated that many participants fail to detect any changes made to their statements, at any time point, and that their memory can conform to the alterations that are made (e.g., Cochran et al, 2016; Stille, Norin & Sikström, 2017). Cochran and colleagues (2016) found that approximately 93% of participants failed to notice changes made to their memory responses, and that participants' later answers tended to shift in the direction of the alterations that they had been presented with. For example, in Cochran et al's study participants were asked "how tall was the thief?", and they were required to answer along a scale from 5'7" to 6'2".

If the participant's height estimate had been altered, their later estimate often became closer to the altered estimate than to their own original response. Stille and colleagues (2017) similarly found that 85% of participants failed to notice changes made to their memory responses at any time point, and that for those 85% of participants who did not notice all of the changes, 68% of the altered answers subsequently changed in line with the alterations. Therefore, witnesses who fail to detect (subtle) changes to their own responses regarding a witnessed event may: a) not notice these alterations, and b) misremember these details later.

In the above studies, memory blindness was assessed for scale-type questions, so that the experimenter could easily alter the participant's memory response by moving their answer along the scale. Memory blindness has also been investigated for statements that better reflect the open-ended questioning that witnesses undergo during formal police interviews. Sagana, Sauerland, and Merckelbach (2017) asked

participants to write, in an open-ended format, everything they could remember about the video they had witnessed. The researchers then changed some of the details within the witness's recall account. For example, if the participant had written that the bystander's hair was "brown", this was changed to "red". Participants were given their statement to read over and were asked to clarify their responses, to test whether they noticed any of the changes.

Overall, memory blindness rates were lower than the previous studies; 89% of alterations were detected by participants, when they were exposed to these alterations very soon (i.e., 30 min) after completing their initial recall. However, this still means that participants did not pick up on 11% of changes made. Given how accurate participants were initially at remembering the witnessed event, the findings suggest that even correctly remembered details that are altered can go undetected by witnesses.

Factors affecting memory blindness in witnesses

Emerging research is helping to understand the factors that influence the occurrence of memory blindness in eyewitnesses. One factor that appears to influence memory blindness is the length of time between when the witness gives their initial statement and when they are presented with the alterations. In Sagana and colleagues' (2017) study mentioned above, the average number of alterations that were not detected was significantly higher (47%) when there was a one-month delay between when the statement was initially provided by participants and when participants were exposed to the altered version.

This was in comparison to a 2-day delay (12% of alterations undetected) and a 30-minute delay (11% of details undetected). Given that there will be logistical delays between providing the statement, the statement being written up, and the statement being printed for the witness to read, the finding that even a brief time delay can reduce a witness's ability to detect alterations to their statement is a cause for concern.

Another factor that appears to influence memory blindness is how similar the alteration is to the original witnessed detail. Recent research from our lab has revealed that when the alterations were highly similar to the correct detail that occurred in the witnessed event, participants were less likely to notice the alterations compared to if the altered and original detail were dissimilar (van Golde, Venn & Wolf, 2019). For example, if the original detail was that the perpetrators entered through the living room, participants were more likely to experience memory blindness if the alteration was "dining room" compared to "garage".

This finding is supported by the discrepancy detection hypothesis which states that the more similar the altered and original detail are to one another, the harder it would be for witnesses to notice discrepancies between the two (Tousignant, Hall & Loftus, 1986). The fact that highly similar alterations may frequently go undetected by witnesses is practically concerning, given that any unintentional changes to witness statements are likely to be similar to what the witness recalls. Furthermore, how well an eyewitness remembers the criminal event initially may influence how susceptible they will be to experiencing memory blindness. Within our lab, Brown and van Golde (2017) found that participants who provided a more accurate initial recall, prior to being exposed to manipulations in their statement, were more likely to detect alterations made to their statement retrospectively. However, initial memory accuracy did not influence whether participants would notice the discrepancies concurrently. Therefore, while more accurate witnesses may be less likely to experience memory blindness, future research should seek to provide clarification on when this accuracy will benefit them.

Witnesses may be less likely to experience memory blindness when they are more confident in their initial memory. However, these findings are not completely consistent. Specifically, van Golde, Venn and Wolf (2019) asked participants to rate how confident they were in their memory responses when initially providing their recall, as well as when later exposed to the alterations in their statement. It was found that participants who were more confident in their initial memory responses were less likely to experience memory blindness concurrently (i.e., when reading through their altered statements), but they did not differ in rates of memory blindness retrospectively (i.e., when asked at the end if anything was changed) compared to those with lower initial confidence.

Additionally, participants with greater initial confidence were also less likely to report the alterations in their later recall compared to participants with lower initial confidence. Therefore, while confidence may be a factor relating to memory blindness and subsequently misremembering the alterations, more research on the relationship between confidence and memory blindness is needed to ascertain this. An additional factor that has been looked at in the context of memory blindness is the way in which the witness statement is taken. Across studies within our lab (Brown & van Golde, 2017; van Golde et al., 2019), different recall modalities such as writing, typing, and speaking were all compared in rates of memory blindness. Brown and van Golde (2017) showed participants a video of a car accident, following which half of the participants typed up their own statement, while the other half gave their statement verbally to the experimenter.

It was found that across all participants, 58% failed to notice any changes made to their statement at any time point; noticeably there was no difference in memory blindness rates between participants who typed or verbally provided their statement. Similarly, van Golde et al. (2019) compared typed to (hand) written recall and also found no difference between the modalities with respect to rates of memory blindness. Memory blindness therefore may be pervasive regardless of the format under which a witness gives their statement to police.

It may, however, be that it is not the format under which a witness provides their account that affects memory blindness, but rather the social context. When comparing across the studies conducted within our lab, memory blindness rates were higher when the study was conducted in the presence of an experimenter (58%: Brown & van Golde, 2017) compared to when the study was conducted entirely online (14%: van Golde et al., 2019). Additionally, in Brown and van Golde (2017), five participants who reported that their statement had been altered when they were reading the altered version later retracted this belief retrospectively. This may have been caused by the reassurance that the experimenter provided to the participant that the statement was indeed their own. Therefore, the mere presence of an interviewer, or an interviewer providing reassurance to a witness about their statement, may contribute to memory blindness and subsequent memory distortion. However, as the presence of an experimenter was never controlled for or directly manipulated within these studies, it is important that future research compare rates of

Continued on next page

memory blindness with the presence and absence of an "interviewer", to tease apart any effects of social demands on memory blindness.

Recommendations for interviewers

Memory blindness among witnesses is a real concern for investigators. While safeguards have been put in place - for example, getting witnesses to read over their statement and sign to confirm that it is correct (Cochran et al., 2016; NSW Code of Practice for CRIME, 2015) - such safeguards may not necessarily be effective in eradicating memory blindness. Officers should therefore take additional precautions when taking witness statements in order to reduce the occurrence of memory blindness.

Firstly, time delays between when the witness initially provides their statement and when they are asked to confirm that their statement is correct should be minimised. While administrative delays are common within criminal investigations (Gabbert, Hope & Fisher, 2009), police officers should aim to have the witness read through their statement and sign to confirm it as soon as possible after providing their initial recall, to ensure that if any unintentional changes have been made to the witness's statement, they have the best opportunity possible to detect them.

Further, investigators should take as much care with witness statements as they would with suspect statements. Specifically, a witness's statement should be taken down verbatim, to avoid the possibility for alterations to be made as a consequence of shorthand techniques. While errors may still be made even through verbatim statement taking, witness interviews should be audio recorded to ensure that the initial and undistorted account of the witness is captured and can be accessible (Tudor-Owen & Scott, 2016).

Given that interviews are conducted in face-to-face environments (Dioso-Villa et al., 2016), interviewers should minimise the social pressure placed on the witness as much as possible. For example, if a witness stated that they believed a detail in their statement was incorrect, such a claim should be taken seriously. Reassuring a witness that the statement is wholly theirs may have the unintended effect of allowing an unintentional alteration to be later misremembered by the witness. When a witness makes such a claim, audio recordings of the interview should be drawn upon to confirm whether an error was made, and if so, rectify it.

Ultimately, interviewers should always aim to conduct a high-quality, evidence-based interview in line with existing procedures. This serves the wider benefit of ensuring that the information provided by the witness is as accurate as possible. Additionally, given that high quality interviewing techniques are associated with eliciting more accurate subsequent witness testimonies (Hope, Gabbert & Fisher, 2011), and that initial memory accuracy may be associated with reduced memory blindness, an initial high-quality interview could serve to protect witnesses from experiencing memory blindness.

Conclusion

When witnesses provide police statements, it is possible that unintentional changes may be made to key details within their statement. The above research shows that there is a high likelihood that witnesses may fail to notice these changes, which may subsequently distort the witness's memory for those details. Several factors may influence memory blindness, such as time delay, detail similarity, memory strength, and confidence. Future research is needed to reaffirm these findings and to identify further factors that may influence memory blindness in eyewitnesses. However, given these preliminary findings in combination with the serious consequences of memory blindness, investigators should take necessary precautions to enhance the quality of the witness's statement and reduce the possibility for memory blindness to occur.

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Police self-legitimacy: A qualitative study of student officers in the United Kingdom

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Objective

This study seeks to examine how student officers (recruits) develop self-legitimacy. Self-legitimacy can be understood as the belief that one's position of power is rightful; that is, morally justified within a normative framework of belief. This study of self-legitimacy explores how power-holders (e.g., the police) justify their authority to themselves and their audiences (e.g., the public). To date, research on self-legitimacy tends to finds positive correlations between higher police self-legitimacy and, for example, greater support for suspect rights (Bradford and Quinton, 2014).

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Background

The murder of George Floyd by Minneapolis police officer Derek Chauvin prompted global protests, movements to "defund the police", and calls for less punitive crime control (for example, see JohnJayREC, 2020). This crisis of legitimacy again raised the issue of racist police practices and the overreliance on force. These high profile cases combined with widespread public condemnation of the police may undermine police officer's own views about the legitimacy of their authority and reduce their willingness to cooperate with the public (Wolfe and Nix, 2016). In addition, the role of the police has been significantly expanded to include policing public health mandates, such as compliance with COVID-19 restrictions (Kyprianides et al., 2021).

Bottoms and Tankebe (2012) have convincingly argued that legitimacy is an ongoing dialogue between power-holders (e.g., the police) who make claims to possess legitimate authority and their audiences (e.g., the public) who respond to those claims. For instance, the members of the public may view the policing of violence as legitimate, but the policing of public health mandate as less legitimate. Thus, interactions between the police and the public help shape the public's views of the police and the officer's sense of their own legitimacy (Tankebe, 2019).

Expanding on studies about the public's perceptions of police legitimacy (Mazerolle et al., 2013), researchers have begun to explore how police self-legitimacy is cultivated and the influence it has on attitudes and reported behaviours (Tankebe, 2019). For example, higher police self-legitimacy has been linked to greater support for procedural justice (Bradford and Quinton, 2014). In another study, negative media publicity was found to reduce the police's willingness to engage with communities, but fair treatment from the police organisation and higher self-legitimacy appears to counter it (Wolfe & Nix, 2016). More recently, police fears of appearing racist have been linked to lower self-legitimacy and greater support for coercive policing (McCarthy et al., 2021). Conversely, a recent study on policing COVID-19 found that higher self-legitimacy was associated with increased support for police use of force and lower officer well-being (Kyprianides et al., 2021). The authors speculate that officer's with "excessive confidence" may not be able to change rapidly enough to shifts in the external environment (e.g., a global pandemic). In short, police self-legitimacy may help promote procedurally just policing, lower support for use of force, and insulate officers from negative media publicity.

Method

This study took place between 2018 and 2019 with Greater Manchester Police at the Sedgley Park Training Centre. While this study uses a mixed methodology (inc. longitudinal surveys), only the qualitative data is be reported here. The semi-structured interviews were conducted in private with 26 student officers out of a class cohort of less than 100. The interviews included questions about the role of the police, the rightfulness of police authority, the role of the public in policing, the use of force, and the causes of crime. A the interviews were transcribed verbatim and a thematic analysis was conducted using NVivo, which is a qualitative data analysis program.

Selected findings

A thematic analysis of the interview data revealed a number of interesting findings; this paper will detail five. First, in terms of justifying their power, the student officers viewed their authority as necessary for a well-functioning society (n=21) and to protect people (n=19). Additionally, they felt that their authority is morally justified because it is constrained by the law, accountable, and carried out with the consent of the public (n=19). In turn, the participants suggested that abuses of power could undermine their belief in the rightfulness of police power (n=12). As one explained, "corruption in police and corrupt constables can make you doubt whether there should be anyone in society that have those powers over other people" (Interview 10).

Next, the students hoped to become ethical (n=19) and effective (n=18) officers. By ethical, they imagined themselves developing into approachable (n=6) power-holders that were fair (n=7), trustworthy (n=5), and empathetic (n=4). For the participants, being effective meant being competent (n=11), solving crime (n=11), and helping people (n=8). They saw themselves more as problem solvers, than crime fighters.

Third, the respondents felt that the ability to use force was a necessary, but unfortunate, component of policing. It was necessary to carry out one's duties (n=18), to protect oneself (n=11), and to protect others (n=9). They felt that any use of force needed to be justifiable (n=9), proportionate (n=9), and that it should be escalated upwards (n=7). A smaller number expressed stronger discomfort with the use of force, but still acknowledged its necessity (n=5). As on detailed, "it's constantly drilled into you through all your training, and especially from what you learn on the job, that your communication is always your first weapon against people" (Interview 23).

Fourth, the future officers shared a strong commitment to the requirements of their new role. They overwhelmingly reported that their duty would take priority over their personal morality (n=20).

Finally, the analysis revealed that the participants largely viewed crime as the result of tragic circumstances. This included issues related to poverty (n=17), upbringing (n=13), and substance misuse (n = 8). For instance, one said, "some people who have such a bad start in life that [crime] was almost inevitable" (Interview 17).

Discussion and future research

This study sought to use qualitative data to better understand how police view the nature and legitimacy of their role in modern-day policing. The findings indicate that the student officers draw a sense of legitimacy from a belief that they fulfil a crucial function in society, that they protect people, and that they wield "bounded authority" (Trinkner et al., 2018); that it, it was important for them that their authority is limited by the constraints of the law and the consent of public. They wished to become ethical and effective officers that wield constrained power. For them, it was important that their authority was obtained and exercised with references to shared social values (Beetham, 2013).

Critical to the issue of power-holder legitimacy, Muir (1977, pp. 3–4) argued that 'good' police officers require two virtues: first, to develop a "tragic perspective" by being able to "grasp the nature of human suffering"; and second, to be able to "resolve the contradiction of achieving just ends with coercive means." Officers who fail to integrate the use of force and a tragic view into their moral framework may develop strategies of avoidance, conciliation, or coercion. These student officers viewed crime as largely a product of tragic circumstances that meant that people required help, rather than punishment. In addition, to fulfil their duties, they viewed the use of forces as necessary for protecting themselves and others.

Until recently, research on police self-legitimacy has been ignored in favour of studying public perceptions of the police. While this study is small in nature, it acts as a starting point for future studies that seek to better understand how officers view their authority and the potential steps that a police organisation might take towards cultivating officer self-legitimacy. Self-legitimacy has been tied to a range of positive behaviours, including respect for suspect rights and a preference for non-coercive behaviours (Bradford and Quinton, 2014). Yet, paradoxically, excessive officer self-legitimacy may lead to rigidness and an increased willingness to use force to fulfil their duties (Kyprianides et al., 2021).

Thus, further research is necessary to better understand how officers develop self-legitimacy and to examine the causal relationships between self-legitimacy and police behaviour. To date, self-legitimacy research is predominantly survey-based and would benefit from longitudinal research, field observations, and triangulation with staff records (see Muir, 1977). In turn, this research could be used to develop training, policies, and practices that improve the relationship between the public and the police through a dialogic understanding of police legitimacy. Without legitimacy, 'policing can very easily become part of the problem of order, not part of the solution' (Bottoms & Tankebe, 2017, p. 63).

Limitations

There are several limitations that need to be acknowledged. First, the findings are limited to a single cohort of student officers from Greater Manchester Police and therefore the generalisability of the findings are limited. Second, the participants were not randomly selected and therefore may not be reflective of the wider cohort. Third, while attempts were made to reassure participants that their data would be anonymised and that their participation would not have any institutional repercussions, they may have given socially desirable responses.

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The Crossroads Project – ANZSEBP 2021

Authored By: *Mike Wall, Evidence Based Policing Centre and Craig Heslop, Waitemata Policing District, New Zealand Police*

In May 2020 we began a 12-month prevention initiative targeting volume crime offenders* in Waitemata East, New Zealand. While responding to volume crime is a role of the police, I grew frustrated by the excessive calls to action created by a minority 'power few' (Polans et al. 2018). As part of the Tactical Crime Team (TCU), a dedicated volume crime response team, we had a 'street' understanding of those frequent offenders who continued to hurt our community.

Unfortunately, our response model did nothing to address the 'Drivers of Demand' or put simply, the underlying reasons why people offend. If volume crime is the water in a barrel, we simply plugged holes and watched as the water mark rose. We needed to start turning off the tap. Luckily, the revised 'Our Business' model and the intent of our Area Leadership Team (ALT) aligned with my own vison for change. In an era of increased police scrutiny, it was time to evolve from the siloed law enforcement lens (Docobo, 2005).

Policing by consent is a Peelian principle that is needed more today than ever before. The Crossroads Project was designed to direct our resources at the 'power few' while focusing on a restorative approach. This enabled us to understand the needs, values and concerns of our local offenders. Comprehensive knowledge gave us the tools to manage risk and transition the offender back to the person (Jerome, 2020).

Accordingly, we developed a 'Risk of Reoffending' score that was updated for every physical meeting. Whether we liked it or not, these people were part of our community. We had the choice to continue enforcing our laws on those who are broken, misguided and desperate or to be part of the solution. The following article outlines the support provided by the Evidence Based Policing Centre (EBPC), the system design, and outcomes associated with the Crossroads Project.

The ALT were confident in supporting a 12-month trial, however, they wanted to ensure it was measured effectively. The EBPC were fundamental in removing bias and clearly understanding the causes and effects. The cohorts of offenders were prioritised through the New Zealand Crime Harm Index (NZCHI). A targeted approach ensured we got the biggest bang for our buck. A randomised treatment group were mirrored off with a control group. The treatment group were given the Crossroads service while the control group received a business as usual response model.

There was statistically no significant difference in the characteristics between the treatment group and control group:

Age: $t(54) = -0.44$, $p = 0.66$

Prior convictions: $t(54) = 1.57$, $p = 0.12$

Gender: $X2(1, N = 56) = 0.16$, $p > 0.05$

Ethnicity: $X2(4, N = 56) = 3.59$, $p > 0.05$

Both cohorts grew to 34 members each. Every person in both groups, was living and offending in Waitemata East and between the ages of 17 and 34. We also ensured that they were not receiving any other police prevention initiatives such as Family Harm Prevention. Those in the randomly selected treatment group were given the choice to take part in the pilot at their own discretion. Surprisingly, only 4 individuals who were approached rejected the opportunity to join the Crossroads Project. We gave the same explanatory talk to every individual. They understood that they were our priority due to their prior convictions, that we would support and coach them for 12 months and hold them accountable for any further crime they committed.

It is important to acknowledge the systematic approach in which we supported our participants. We profiled each participant, listened to their history, acknowledged their current position and began creating a vision for the future. This was done without judgement. 'Be first, then do' is an abstract concept championed by the current Commissioner, Andrew Coster. It was important that we treated these historical offenders with compassion and humility.

Participants disclosed a history of abuse, neglect, mental health and drug addiction. These people's journey to crime was logical given their life experiences. Participants had a vision for change but lacked the resources, confidence and support to turn this into a reality. It was our priority to play the long game and promote 'thriving through enhanced self-efficacy and confidence' (Baker, Baker & Burrell, 2021). We set some 3-month goals prioritised according to Maslow's order of needs. We made an action plan of what was expected from the participant and their assisting police officer. Each case was different so it was unreasonable to create a one-fits all template. Much of the support that the participants required was out of the police's scope of practice.

We connected with professional partner agencies who cared deeply about community. Geller and Belsky (2009, p. 12) state the power of community development sustainably reduces crime and fosters liveable communities. Organisations such as Ember, MSD and Northern Jobs addressed mental health, education and careers respectively.

Other groups such as the Salvation Army, SPCA and Plunket became respected partners and received the acknowledgement they deserved. 94% of participants had a current or past addiction to methamphetamine. We acknowledged that finding suitable rehabilitation and support was near impossible for participants. While filling every interaction with humility was ethically the right thing to do, it also dissolved any past excuses participants had made for committing crime.

Each interaction with every participant was recorded. Interactions were either physical meetings, phone calls or text messages. Every agency referral was updated in the National Intelligence Agency system (NIA). This enabled us to observe who was making the biggest difference in people's lives. Progress was diligently updated and transparent for all to see. Every participant was given an alert on NIA to ensure any police officer who met them, treated them as normal but also to make an in-depth intelligence noting of the interaction.

Positive role models within the participant's whanau and friends were identified and approached. These multiple 'anchors' increased accountability and intelligence opportunities for each participant. As we continued to communicate with participants for no other reason but to prevent further offending, the relationship began to change. These people with hundreds of prior offences and years of dislike towards the police, began to trust us. Crime families began to open their doors and welcome us into their whare (home). As well as the quantitative data comparing rates of offending, we received feedback from our participants and their families:

'We have absolute trust in the police. At first it was like do we trust them and what is their agenda? Crossroads has prevented a lost soul from committing more offences and saved our family.' Participant's Father

'We won't call cops pigs anymore!! I defo trust them more. It's all how you are approached'. Participant

'Relevant, positive, proactive and crucial – focus is on strengths and moving forward rather than a punitive approach which often crushes hope or being able to see a way forward'. Salvation Army

Results (9 months)

It was observed that the participants in the Crossroads Project caused less harm to the Community than the Control group. The Control group caused 82% (NZCHI 889) more harm to the Community than the participants in the Crossroads Project from June 2020 to March 2021.

This means that the majority of the reoffences by the Crossroads Project participants were against the law but caused little harm to people. This suggests that the work the Crossroads Project are doing with the participants is associated with a reduction in severity of reoffending.

The mean Crime Harm caused per person for the control group was 38 compared to the treatment group which was 7.6. This means that the average Crossroads participant causes substantially less harm to the community compared to a control group participant.

To put this comparative number into context, the Crossroads Project has prevented the equivalent of:

44 Burglaries or

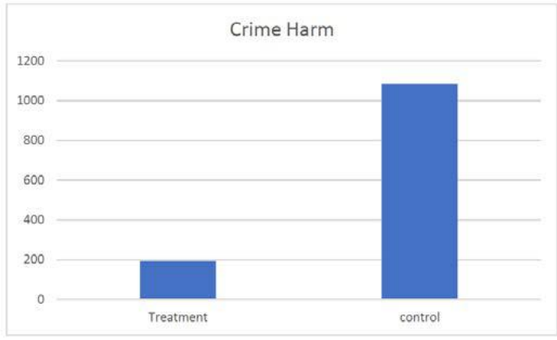
71 Theft ex cars or

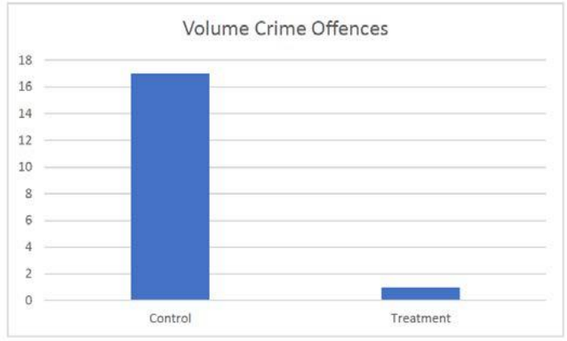
2 Manslaughters or

9 Robberies or

59 Assault with intent to injure.

That is prevention of harm.





*Volume Crime involves burglary, car theft, unlawful takes, unlawful converts or theft ex ca

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He waka Eke Noa – We are all in this together

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An action research project designed to support the leadership development and wellbeing of police leaders, their staff and the communities they serve.

Introduction

World events in the past 18 months have shown us that we are indeed “all in this together” -whether that idea appeals to us or not. These world events have contributed to a policing environment has become more volatile, uncertain, complex and ambiguous, (VUCA) than ever before. There is a growing awareness that if police are to contribute to the justice reform and community safety levels that they and their communities desire, then police staff need to be supported in ways that will allow them to contribute meaningfully to those changes.

He Waka Eke Noa is an Aotearoa New Zealand Police appreciative action research project. The project is embedded within an Area Leadership Development programme entitled Tu Tika Tu Pono. Tu Tika Tu Pono supports the leadership development of an Area Leadership team consisting of the Area Commander, Senior Sergeants and Sergeants. He Waka Eke Noa explores both a Te Ao Maori (the Maori world view) and Collective Leadership as vehicles for learning and development. These approaches seek to encourages the development of policing practices which support the NZ Police strategic Plan – Our Business, specifically in relation how we support Our People Our Leaders, Our Culture and Our Partners.

The vision of the project is “Thriving Police staff supporting thriving communities, particularly vulnerable Maori .” The vision is based on the premise that when police staff are supported to connect with their values in meaningful ways, then those values will impact positively on their individual and collective contributions to policing. This values-based approach opens the door to connecting more meaningfully with the communities they serve. An appreciative approach has been taken because the nature of policing means that very often the focus is on what’s going wrong. This deficit lens makes us potentially blind to the possibilities of what is, or could be going right. When an appreciative approach is considered the potential for innovation increases.

The development programme therefore takes a blended approach of a te Ao Maori leadership framework and a modern Collective Leadership/systems-based approach. Both these approaches have individual and collective wellbeing or hauora at their core.

Te Ao Maori Approach

A Te Ao Maori approach connects people to people, people to place and people to the environment - both physically and metaphysically. The connection to place is the starting point.. This is very different from traditional leadership development programmes which are largely individual based and individually focused.

A Maori framework based on understanding connection beyond just people, commits us to develop genuine relationships with our community. Relationships that are about connecting more than just people together. Where "we become the place" and the communities that we police.

It is clear that from a Maori perspective that Place comes first, the Wairua or spirit (feelings of connection people have to place) second, and then People. The police leaders in this project have begun to explore what that perspective looks like in policing leadership practice.

Collective Leadership Approach

In contrast to te Ao Maori, but very connected at a values level is the collective leadership approach. Collective leadership has emerged broadly from systems theory with contributions from neuroscience and quantum physics. The three principles of collective leadership below, align strongly with the New Zealand Police Commissioner’s three priorities.

Firstly; Leader being before doing. This is an invitation to bring the authentic self into the workplace –something that both requires and creates a high trust environment. A very big aspiration in a demanding policing environment.

Secondly: Leading from the “whole” rather than the “rock .” This principle seeks the end of the Great Man theory of leadership and acknowledges that every person in the system or collective makes a critical contribution. This principle recognises that truly powerful leaders lead from a space of equality not solely from having positional power or rank.

Thirdly; Being equipped to lead from the emerging future . This final principle is a little more complex to understand. The key is in the words “being equipped.”

We indicated in the introduction that the policing environment – indeed the social, political and environmental environments are VUCA (volatile, uncertain, complex and ambiguous).

Therefore, expecting to be able to plan and execute in totally predictable ways can no longer be the norm. “Being equipped” then, means learning to be comfortable with uncertainty- it means

Continued on next page

managing not knowing, making space to ask "big hairy" questions such as; why are we here? how do we hold our biases to account? how do we find comfort in not knowing? and how do we transform our capacity to achieve a safer New Zealand? Being equipped also means being prepared to make mistakes and to forgive ourselves and others for those mistakes. It means extending trust to some people we've not trusted before (both within and outside police). Finally, it means knowing when to act fast and when to act slow, to take the time to sense and respond to the future as it emerges.

Method

Action research

Put simply action research is a "done with," not a "done to" approach. Unlike traditional research, action research invites people to become researchers of their own practice and to gather evidence as they work towards making improvements. The research team therefore consists of members of an Area Governance Group of Senior Sergeants, their Area Commander, local kuia and kaumatua and the authors.

We want to understand "What are the most effective learning and development strategies to support policing area leadership teams to lead in collaborative and innovative ways?"

Two theoretical approaches are used to guide the research process.

They are the Learning Transfer Systems Inventory (LTSI) of Holton and Baldwin and Bronfenbrenner's Ecological Systems theory. The LTSI identifies that transfer of learning into workplace practice is impacted upon by three areas; the individual's approach to learning, the learning event and the wider environment in which the learning occurs. Twelve construct are identified within these three areas, for example, Perceived Content Validity – which is the extent to which a learner perceives the learning content to accurately reflect their job requirements. The LTIS is used to design open- ended question in group and individual interviews and for setting up priori codes in the data analysis stage.

Bronfenbrenner reminds us that nothing happens in isolation and that the learner sits like a smallest stacking Russian doll at the centre, surrounded by a range of environments that impact on them and they in turn impact on in various ways.

Data sources include 1-1 interviews, focus groups, field notes, reflective diaries, NZ Police documentation (e.g., Police High Performance Framework, Te Huringa o Te Tai and Our Business)

Key Insights to date

Action research expert Jean McNiff describes action research as "critical and risky'. The critical inquiry in this project has meant that everyone involved has been challenged to question their thinking and possibly change it in light of greater self and other awareness. The risky part has involved people being courageous enough to begin to think and behave in ways that are counter to deeply embedded police cultural norms.

Currently the Governance Group is committed to breathing life into the Area SPT (strategic planning template) through exploration and application of concepts that are meaningful to them such as Kaupapa Matua, Tu Tika Tu Pono and Manaakitanga.

Participant comments

Some recent comments from participants include;

"I have a greater awareness of my impact on my group and how I can direct that [impact]. My knowledge of Maori culture and beliefs has increased. This has no doubt improved my empathy."

"Respect within the Governance group has increased. It's not always apparent (you know what I mean) but it has. We are not there yet but are further down the right track. We know more about why things go wrong or right."

"We are starting to bind together in the same way as happens in kapahaka. Each person has "ihi" or energy. The magic happens when each person's ihi connects with each other's ihi and this is a 2 way process. It requires trust, communication, focus on common good for all this to happen, then comes the magic or awe (the wehi)."

And from the Area Commander; "We are at a crossroads right now. Our thinking has grown and expanded, both as individuals and as a collective. At the same time we recognise that we know sod-all. We've been introduced to an expanded world view both in a te Ao Maori and Collective Leadership context and we aspire to operate in this new space. We recognise the need to build a depth of understanding to truly realise our potential and be the difference our community deserves."

2019
6 x 2 day workshops for both Senior Sergeants and Sergeants
2 day retreat for Senior Sergeants

2020
1x 2 day workshop
2 x 1 day workshops
Individual coaching sessions for Seniors (1 -2 per person)
Noho Marae (sleepover) and awa (river) trip for Seniors and Sergeants
2 day retreat for Seniors including ELSP (Body Mind Intelligence) individual and team assessment

2021
2 x 1 day workshops for both Senior Sergeants and Sergeants
1 x 1 day workshop for Senior Sergeants
Ongoing Governance Group meetings including reflections, feedback , peer coaching

Broad strategy insights and highlights

• Take a long game approach – there is no McDonald's version. A space needs to be created over time for relationships to deepen so that trust develops and then true collaboration and innovation can occur.

• Work with intact teams. The opportunity to learn and develop alongside peers pushes boundaries for everyone no matter what their developmental needs.

• Use skilled facilitators who understand or are prepared to learn about a policing context. Support the development of facilitation skills within the group.

• Pay attention to wellbeing – not as a passing topic but as a core theme throughout the programme. There is a sense amongst the researchers that deliberate attention to wellbeing in leadership development it is the key to being able to deliver on strategic goals.

• With skilled facilitation, a te Ao Maori approach to leadership has the potential to promote wellbeing and more critical and innovative approaches to both internal (police) and external (community)y interactions.

• A highlight for some was the river trip and noho marae where interactions with local Maori including elders and ex Gang members provided an opportunity for everyone present to look at old hurts through new lenses.

• The Body Mind Intelligence Assessment at the 2020 retreat revealed leadership strengths in individuals and the team. This was done through a physical mind/body energy assessment – very different from the usual psychological assessments found in most leadership development programmes. This unique approach immediately revealed the collective strengths of the group and provides a framework for ongoing deepening understanding of individual contributions and increased capacity to tap into those collective strengths.

Researcher reflections

Researcher reflection is a key skill in action research.

Know, believe and acknowledge that the group has great wisdom and potential to innovate and create new solutions to old and new problems.

Know, believe and acknowledge that the wisdom and innovation will evolve as the collective evolves.

Make everything relevant to the group and if they can't see the relevance either help them to do so, or do something different that is relevant to them.

Seek feedback and listen to it….. model vulnerability….be a learner yourself

Seek and promote opportunities to step back as others in the group step forward

Be flexible and have fun…..but not at anyone's expense

Experiment with practical tools such as Liberating Structures that give highly practical options for ways to address workplace challenges such as the need to improve meeting processes, behaviours and outcomes.

Final thoughts

There has been limited research on leadership development in NZ Police in recent years. Little is known about the process or impact of applying a te Ao Maori /collective systems-based approach to policing leadership development. The work is ongoing and has been equally challenging, and exciting.

The action research cycle of reflection and action and adjustment has meant some very honest, revealing and challenging conversations during the project to date We have all butted up against old unhelpful ways of being and doing in ourselves and in others. Learning to lead using whole body intelligence (head heart and gut) is a crucial step to building the high trust or "just" culture that is the aspiration of New Zealand Police.

Every single person involved in this project has demonstrated courage to explore new ways of being and doing because they know we can do better for ourselves and our communities. The approach taken in this research project identifies that if we want a different policing future then we must individually and collectively let go of the trapeze we have been swinging on – go into the unknown space…. feel the discomfort, and trust ourselves to grab on to the new opportunities that we can and will create together.

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Beyond the evidence: insights into the role of implementation science from a decade in policing

Conference sub-theme: The new gold? Using data and evidence to target improvements in practice.

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Implementation science is the study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine operations (Bauer, Damschroder, Hagedorn, Smith & Kilbourne, 2015). In other words, implementation science is the study of how to close the evidence-practice gap. The merit in using research evidence to address operational policing challenges is irrefutable to anyone involved in the endeavour of evidence-based policing.

We strive to use data-driven insights, synthesise the evidence and device meaningful interventions that represent an improvement on previous practice. In the context of increasing scrutiny, shrinking budgets and stretched resources, it is more important than ever to ensure that evidence-based practice (EBP) remains in place with reasonable fidelity after we walk away. How do we ensure that happens?

During my decade driving evidence-based practice in a policing context, I worked tirelessly to generate research evidence, train police and develop novel evidence-based solutions for operational policing problems. But only now, after learning about implementation science have I developed a greater awareness of practical implementation activities, which can be applied immediately to embed EBPs in policing organisations.

A large number of implementation frameworks available in the implementation science literature outline the processes and practical strategies that have the potential to support the work of capability uplift within policing services. By making explicit the phases involved in successful implementation, these frameworks enable EBPs not only to be appropriately introduced but also ultimately sustained. An effective evidence-based practice is necessary, but not sufficient, and implementation science brings the missing piece. In order to get to outcomes, and sustain them, it is not sufficient to just focus on the 'what' (the EBP) we also need to focus on the 'how' (implementation process).

An established example of a useful implementation framework outlines four implementation phases, namely Exploration, Preparation, Implementation and Sustainment (EPIS) (Aarons, Hurlburt & McCue Horwitz, 2011). It also identifies factors most likely to have an influence on the implementation of EBPs in publicly funded settings (Figure 1).

Figure 1. The EPIS (Exploration, Preparation, Implementation, Sustainment) implementation framework adapted from Aarons et al. (2011).

In the Exploration phase, a service system or organisation, such as a policing agency considers emergent or existing needs of stakeholders or the community, identifies the best EBP to address them and decides whether to adopt it. Societies of Evidence Based Policing across the world play an important role in examining and generating EBPs but can face challenges at the implementation level when attempting to influence key decision makers. However, during this exploration phase, an opportunity exists not only to provide the EBP but to outline the necessary adaptations to the system, organisation or the EBP itself to optimise its successful adoption and associated impact. This stage also explicitly calls for engaging stakeholders and understanding their needs, which can really lay the groundwork for successful implementation.

During the Preparation phase, the key objective is to identify potential barriers and enablers of the implementation in the specific (internal and external) context, define whether any adaptation is required to the EBP and to develop a detailed implementation plan. The plan clearly identifies key implementation supports and how they will be rolled out. Therefore, it typically includes training, coaching as well as audit and feedback plans and carefully considers how an implementation climate will be developed which will signal that use of the EBP is expected, supported, and will be rewarded within the organisation. In a policing organisation, these plans will likely clarify the cohort to be targeted for training, how they will be supported to adopt the EBP (coaching) and how this aligns with organisational imperatives, relating to evidence-based policing, intelligence led interventions, community partnerships, demonstrating public value, etc.

Moreover, this phase establishes the internal implementation team who will take responsibility for the implementation of the EBP. They will do this my monitoring and working through implementation barriers and enablers, and identifying relevant implementation strategies that will overcome the barriers being experienced. The implementation team needs to be well positioned to navigate and influence the implementation context and must be able and willing to champion the EBP.

In the implementation phase, targeted and planned supports for implementation of the EBP are actioned in accordance with the plan from the Preparation phase. A key focus of this phase must be to monitor, review and respond to data that provides insights into implementation quality and EBP effectiveness. That is, the plan must mobilise data collection efforts and analysis which elucidate whether the EBP has been adopted, whether it is reaching the intended target population, whether it is being used as intended (fidelity), and whether it is having the intended effect. These insights must in turn be used to inform data-driven decision-making about adapting the

implementation plan as required to improve the process and desired outcomes. It is crucial that ongoing monitoring of the implementation process is incorporated into this phase to assess how it is proceeding and to support efforts to adjust accordingly (EPISFramework.com).

Reaching the sustainment phase means that the inner and outer context structures and supports are well positioned to ensure that the EBP continues to be delivered in a manner which enables the desired impact/ improvement on policing practice over a sustained period of time. This means that in the context of dynamic and responsive policing, shifting leadership and priorities, implementation leads must ensure that plans, processes, EBPs and their impact are recorded and appropriately captured to continue. It means that personnel changes on account of promotion, surge response, etc. do not result in an absence of champions and local implementation drivers for the EBP. Considering and planning for sustainment should be part of all phases to guard against major set-backs, and to maximise forward momentum.

It is important to note that at each phase, there are a range of contextual factors that must be taken into account and addressed in the implementation plan, and these will feature to differing extents in each phase. At the exploration phase for instance, outer context factors relating to legislative changes, funding or community opinions may be key considerations. However, at the planning phase, the focus may shift more to internal contextual factors relating to leadership support, organisational characteristics (e.g. tolerance for innovation) and staff skill-sets. Also during the preparation and implementation phases, the role of partnerships and intermediaries (i.e. implementation specialists) is arguably most important as the organisation prepares the context, individuals and execution of the implementation plan and establishes its collection and future use of data to embed the EBP. Conversely, the characteristics of the intervention in terms of suitability, adaptability and acceptability in the implementation context are relevant throughout the entire implementation process.

Beyond the evidence and internal executive sponsorship, there are practical ways to maximise the impact of EBPs by being intentional about how they are implemented. From preventing bushfires to counter-terrorism watchlists, from hot-spot policing to targeting recidivist offenders, implementation science maximises the opportunities for interventions to have the desired impact and enables an understanding of the specific conditions under which they work. Emerging evidence from scientific or field trials has the best opportunity to lead to sustained change and continuous improvement in policing practice under its optimal implementation conditions. It is clear that once an innovation or intervention has been shown to work in the policing context, it is necessary to methodically and deliberately plan its broader operational execution and implementation frameworks can provide a roadmap to meaningfully guide this process.

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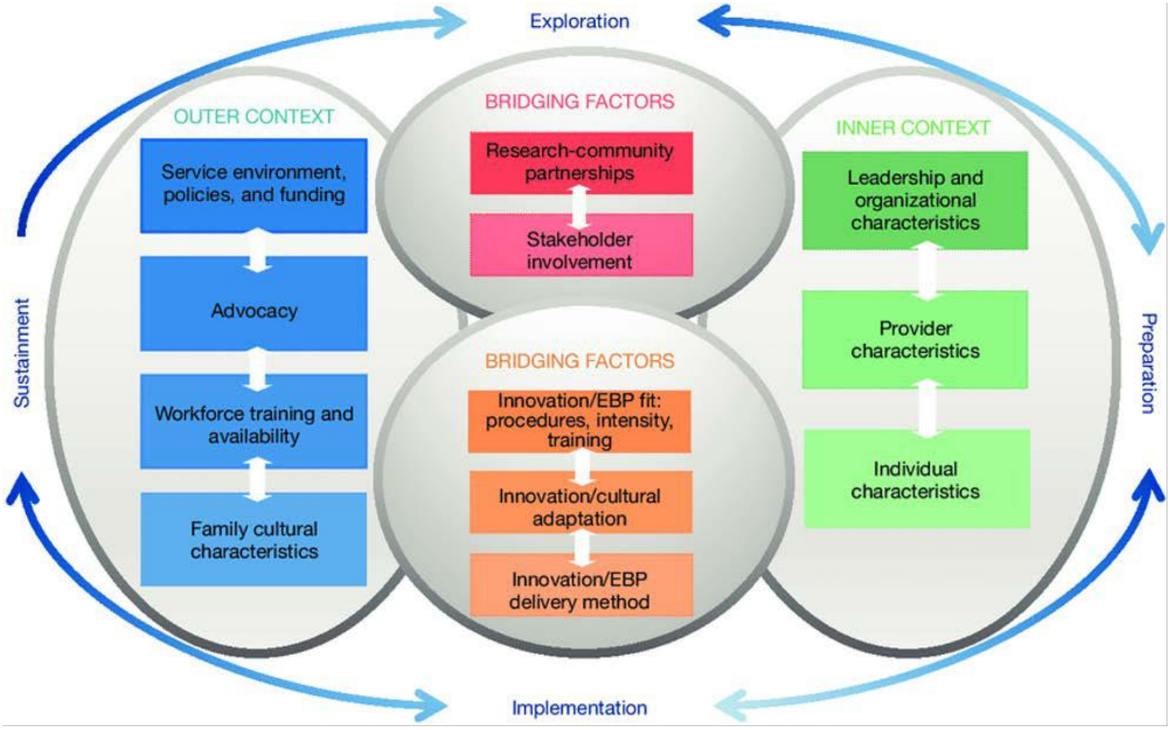

Figure 1. The EPIS (Exploration, Preparation, Implementation, Sustainment) implementation framework adapted from Aarons et al. (2011).

Understanding the Basics of Information and Evidence: Valid Qualitative Data, Valid Quantitative Data, and the Three ‘C’s

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Introduction

The Strategy, Design and Evaluation Team within the Australian Federal Police’s (AFP) International Command often engages with social scientists. Some social science techniques gather data of a standard that may challenge concepts of evidence based policing.

In response to this issue, the AFP is in the process of developing a Data Quality Assessment Framework (DQAF) to be potentially incorporated in a Strategy, Design and Evaluation ‘Better Practice Guide’, which may be shared with contractors to avoid misunderstandings about acceptable standards for data quality.

This paper reviews selected aspects of the theory used to construct the Strategy, Design and Evaluation Team’s DQAF. It examines the fundamental processes needed to create the qualitative and quantitative information police and others rely on to do their work. While academic in nature, these processes are something everyone intuitively uses every day. A more explicit understanding of these processes enables them to be used as a simple ‘test’, to assist in the identification of low quality or invalid data.

How we know anything

You know things. But how is this?

It is important to understand that this paper is aimed at applying consistent terminology to what people already do without realising it. Thought processes that are intuitive or instinctive are often difficult to explain in everyday language. The value of a consistent terminology is it can be used to reveal mistakes in logic that would otherwise be difficult to identify.

Why are these basics important to Police Science? Among its many uses, Police Science is important in prosecutions and court proceedings, as judges must have sound reasons to believe findings presented to them. Prosecutors and police should therefore be ‘informed consumers’ of information, especially that provided by potential expert witnesses. If testimony of an expert witness is revealed as not being defensible (perhaps by other expert witnesses), perceived legitimacy of other casework may also be tainted.

Probably the most carefully worded direction on the position of judges in this context comes from the United States. The US Supreme Court defined the judge’s “gatekeeper role” as entailing:

“a preliminary assessment of whether the reasoning or methodology underlining the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue” (Maxwell, 2007).

The President's Council of Advisors on Science and Technology also made a recommendation to the US judiciary regarding the use of scientific validity as a foundation for expert testimony:

“(A) When deciding the admissibility of expert testimony, Federal judges should take into account the appropriate scientific criteria for assessing scientific validity including: … (1) foundational validity …” (Ibid.)

Why do courts take scientific validity so seriously? Experience has shown that ignoring these basics is a certain recipe for generating ‘junk science’, or more accurately, ‘cargo-cult science’. To use Richard Feynman’s, now famous analogy:

“In the South Seas there is a cargo cult of people. During the war they saw airplanes land with lots of good materials, and they want the same thing to happen now. So they’ve arranged to make things like runways, to put fires along the sides of the runways, to make a wooden hut for a man to sit in, with two wooden pieces on his head like headphones and bars of bamboo sticking out like antennas—he’s the controller—and they wait for the airplanes to land. They’re doing everything right. The form is perfect. It looks exactly the way it looked before. But it doesn’t work. No airplanes land. So I call these things cargo cult science, because they follow all the apparent precepts and forms of scientific investigation, but they’re missing something essential, because the planes don’t land” (Feynman, 1984).

Cargo cult science is, at best, a waste of everyone’s time. At worst, it means you will get things very, very wrong. If you want to gather meaningful evidence, you need to have enough knowledge of the basics to know how to get the planes to land.

From a psychological perspective, researchers who fall prey to unwittingly conducting cargo cult science may be regarded as suffering from the ‘Dunning-Kruger Effect’, in that they are overly confident in their approaches because they ‘don’t know what they don’t know’ (Dunning, 2011).

Information has to mean something

The first criteria for assessing data quality is always that data gathered must have some fixed meaning, because analysing data with no fixed meaning will provide variable analytic conclusions. Defining what ‘having a meaning’ means, is notoriously difficult and is often couched in complex lexicons. Many academic explanations are more thorough than those contained in this modest paper (for a seminal

work in this field, see: Wand, Y., & Wang, R. (1996). Anchoring data quality dimensions in ontological foundations). This paper tries to provide simplified tools for basic practitioners to apply, and constrains itself to consideration of the most important prerequisite of data having meaning; namely that the information is a valid construct. More specifically, that it is valid qualitative or valid quantitative information.

All information is a human construct (Ma, 2010), so it must be created before it can be collected. If we want to draw conclusions about anything to do with the external world, we must know the rules for creating valid information. If a piece of information we collect is an invalid construct, we will fall into the Garbage-in/Garbage-out (GIGO) trap, from which there is no escape. No analysis can give data meaning it didn’t have in the first place.

As a starting point, we should note that there are three commonly accepted, but incorrect, beliefs about information:

1. There are two fundamentally different forms of information, namely subjective and objective information

2. There are two fundamentally different types of objective information, namely qualitative and quantitative information

3. Valid quantitative data has a higher data quality (is more meaningful) than valid qualitative data

Item 1 is incorrect because all objective information has its origins in someone’s subjective ideas. Objective information is not ‘absolute’, it is simply subjective information that has been processed in such a way to render the ideas it describes independently verifiable to other humans.

This theoretical fact does not make the practical distinction between subjective and objective information any less important. Unlike subjective information, objective information does not rely on the mind of a single ‘subject’ for its confirmation. Being able to verify things outside our own minds has huge advantages. This is why robust analyses use objective (verifiable) data to draw defensible conclusions about the ‘real-world’, whereas junk science approaches can use whatever convenient mixture of verifiable and non-verifiable data needed to draw any conclusions they wish.

Item 2 is similarly incorrect, because all quantitative data is, without exception, a processed form of qualitative information.

Item 3 is logically impossible, because, as a ‘processed’ form of qualitative information, quantitative information cannot exceed the data quality of its source. No analytic process can magically create additional raw information.

The assertions made in regard to the above items clearly need further justification. This requires discussion of the Three ‘C’s.

The Three ‘C’s

The Three ‘C’s tool can be used to justify the above assertions. This tool is a way of describing how humans create information. It starts by posing two questions:

- What constitutes valid qualitative data? (What is a quality?)
- What constitutes valid quantitative data? (What is a quantity?)

These may look like trivial questions, but the very serious and ongoing Replicability Crisis currently faced by social scientists (Fidler & Wilcox, 2018), demonstrates that many, even very highly qualified academics and other experts are not always able to answer them correctly. In their defence, this may be because (peer reviewed) literature that directly addresses this particular aspect of data quality is scarce, even though consideration of such matters has a long history (Crosby, 1996).

What is valid qualitative data?

The First ‘C’ -CONVENTION

Qualities are created ‘by Convention’. A convention needs two parts:

- A strong definition
- A strong agreement between all relevant users to adhere to the definition

As an example, this is exactly how you know that something possesses ‘the quality of being red’. Red things do not exist in any absolute sense. We all just agree that when light of a certain wavelength hits our eyes, we have a convention of calling it ‘red’ (-regardless of differences in how we may perceive it). Qualities are not insubstantial things, they are the starting point for all applied sciences, including the physical sciences. To put this in perspective, this is also exactly how we use conventions to verify that something has ‘the quality of being one meter in length’ or ‘the quality of weighing one kilogram’.

What is valid quantitative data?

Valid quantitative data is correctly processed qualitative data. To process valid qualitative data into valid quantitative data takes two further steps.

The Second ‘C’ -CLASSIFICATION

Classification is a structured process of differentiating things, either by breaking them into different categories or identifying unique instances of the same thing. Use of classification/categorisation is one of our most fundamental means of understanding the world. To continue with the example of things possessing ‘the quality of being red’, before you can use this ‘redness’ in a more structured way, you need to classify the world into two categories: things that are red and things that are not red. Alternately, for the example of the metric system of distance measurement, you need to classify any distance into set of unique and non-overlapping examples of lengths possessing the quality of being one meter.

The Third ‘C’ -COUNT

The last step is simple. It is Count. If two people share a strong convention on what a red thing is, and can therefore consistently classify the world into red things/not red things, they can now independently count the quantity of red things they see and reliably produce the same answer. This makes the result verifiable and replicable; which demonstrates a degree of fixed meaning of a result.

Continued on next page

To recap, in the ‘process of quantification’, it is the first ‘C’ (Convention) that enables the second ‘C’ (Classification), which then enables the third ‘C’ (Count). There is no other way to create valid ‘quantities’. If you want to claim something is a valid quantity, it must have been processed through all Three ‘C’s.

How does knowing these basics help in practice?

One insight an understanding of these basics provides is that often, the key differences between data quality standards applied by physical sciences and social sciences is the strength of the conventions initially applied when creating qualities, and thereby deriving quantities. The less strong the conventions applied to generate initial qualities, the more likely junk science is being conducted.

Another use of the Three ‘C’s is in the derivation and application of ‘units of measure’. ‘Quantities’ that are expressed without robustly defined units are unlikely to be valid quantities. In fact, *“Units of measure are how we express measurements of quantities” (USNRC, 2021).*

In more practical terms, the three ‘C’s can help spot problems with existing research, such as when a survey or some other instrument is unlikely to collect valid qualitative or quantitative information.

Example 1. Consider two possible survey questions for residents of a particular street:

1. How many criminal activities have you witnessed in your street, in the past week?

2. How many times have you seen someone subjected to physical violence by one or more other people in your street, in the past week?

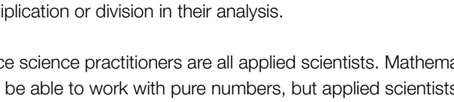
We might all be able to use our common sense and say that the second question is better because it is more specific, but why is this better?

In the Three ‘C’s’ terminology, we would say that no strong convention is likely to exist that carries a shared definition between the researcher and all residents as to what things possess the quality of being a ‘criminal activity’. Laypeople may not be aware of the difference between criminal and civil offenses, and therefore may include people getting parking tickets in their responses. Others may consider youths fighting in the street as ‘just a bit of fun’, and not include such incidents. ‘Criminal activities’ is a broad term, of which laypeople have varied understandings. If you ask a question this way, you will get quantitative responses, but you won’t know what respondents are classifying and counting.

In contrast, the quality of being a case of someone ‘subjected to physical violence’ is something for which researchers and residents are likely to already share a reasonably strong convention. Physical violence is something we can all more reliably recognise. This example may seem obvious, but cases of weak conventions in questioning are very common, especially when translations and cultural assumptions come into play.

Example 2. Consider the following, very common, type of survey question:

1. Please provide a score, on a scale of 1 to 5, for how severe the impact of acts of physical violence has been on residents of your street in the past week.



If someone responds with a ‘2’, what does this data point mean in terms of capturing verifiable evidence? The answer is ‘probably not what you hope’, because this question is not measuring anything rigorously definable. To start with, there is no shared convention on what ‘severity’ means. A person who has lost their only son to gang violence would likely return a very different point on this scale to someone who was delayed by traffic as the ambulance took away the body. The same ‘real world’ event occurred, but the subjectivity of respondents has never been processed into something objectively verifiable. So, with no strong convention set, ‘severity’ is not a valid quality in this context. Without an initial valid quality, there is no hope of deriving any valid quantities.

Some researchers try to overcome this by creating their own definition of ‘severity’, but this is pointless unless all respondents share and understand this definition. As a tip for the unwary, please note that trying to create a new convention about anything but the simplest concept across language, education level or cultural barriers is not a trivial endeavour (Drake & Wilson, 2008). A few cursory instructions in a survey will not usually achieve this.

So what is this ‘2’ that sits along this response format? It is simply a label to one pre-specified, response option. The fact that it uses a numeral to identify this response option carries no particular significance, it could have as easily been a letter of the alphabet, some words, or even a picture of a cute little fluffy dog named George.

Using a numeral as a response category label does not magically render the response a number or quantity. Which also means you can’t use mathematical operations like addition, subtraction, multiplication or division in their analysis.

Police science practitioners are all applied scientists. Mathematicians may be able to work with pure numbers, but applied scientists must deal with ‘numbers of somethings’, which, by definition, implies ‘quantities’ (Oxford Dictionaries, 2021). By proposing the response format shown above, the researcher has not established a convention, they have failed to classify anything in relation to a convention, and nor have they counted anything by applying a classification. The numerical labels are therefore not valid ‘quantities’ of anything, which begs the question why do so many researchers persist in using them, especially when they could alternately use much nicer pictures of little fluffy animals?

One counter-argument often raised is that the researcher does not intend these symbols to be interpreted as ‘full quantities’, but rather as ‘ordinal quantities’ (e.g. rankings of things).

Ordinal quantities are a real and useful thing. The term ‘ordinal’ means you may only know that one quantity is bigger than another, but you don’t know how much bigger. Aside from the fact that those who try to claim this ‘ordinal loophole’ usually use evenly spaced, consecutive

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numerals as the labels to their responses, which would appear intentionally misleading, this claim also shows a lack of understanding of the theory of ‘ordinal quantities’.

The mathematic restrictions on analyses applied to ‘ordinal numbers of things’ are actually far greater than on ‘full’ numbers. They also require a process very similar to the Three ‘C’s to render them valid. The only real difference is that final step (the counting process), is less complete and simply uses a comparative approach (e.g. “I haven’t counted them, but just by standing the two groups back to back, I can tell you there are more red haired people in room A than in room B”). Even this more limited process has never been carried out for the response format in example 2, so the numerals are not ‘ordinal quantities’ either.

Replacing numerals with words does not necessarily solve this issue, because trying to contrive ordinality by placing words along a scale or in a set sequence does not necessarily override respondents’ own semantic interpretations, and even variations in presentations of semantic scales can create biases (Chezy, Reddy & Bechtel, 1987).

Some researchers try to stretch their assumptions even further and claim that their subjective response constructs represent ‘interval scales’, which would mean they think they know not just the order of the points but the absolute distance between them. While the same counter arguments remain applicable in regard to such claims, a lot of ‘analytical convenience’ rides on whether data is ordinal or interval in nature. The literature is full of unresolved arguments over this distinction in relation to subjectively scaled response formats, because it defines whether researchers can use (convenient) parametric or (less-convenient) non-parametric statistical methods in analyses (Bishop & Herron, 2015; Kero & Lee, 2016; Mircioiu & Atkinson, 2017).

In truth, the arguments should never get this far, because no valid process of quantification of any type has ever taken place, so whatever the analysis involves, if it uses such labels as raw quantitative data, it will fall prey to GIGO.

Questionable use of numerical labels can be termed ‘subjective quantification’. If quantification is intended to refer to some verifiable and replicable form of objective measurement, ‘subjective quantification’ will always be an oxymoron.

Regardless of anything else, these response constructs generate unprocessed subjective data. In technical jargon, this unprocessed subjective data is known as psychometric data. Psychometric data may be useful for psychometric research about people’s states of mind, but it has the lowest data quality possible for researching objectively verifiable realities. This is because it is unconstrained by anything but the subjects’ imagination. Researchers and peer reviewers should therefore regard this type of response format as method of last resort for research about objective realities.

In practice, confusion between the terms ‘subjective’ and ‘qualitative’ often leads to people trying to claim they have measured a verifiable quality or quantity, using a psychometric measure. One common example is trying to claim concrete findings about a training course’s quality, without ever measuring any verifiable qualitative aspects of the course. Use of purely psychometric data from participants as a proxy (e.g. from a satisfaction scale), is a very low quality basis for such findings; not least because such psychometric data will also be ‘mood dependent’.

Despite these problems, many researchers still collect very low quality data, such as the products of subjective quantification. Why have such low data quality options gained traction among researchers? First, they provide researchers with a convenient means of avoiding thinking about what they really need to know. Asking ‘vague’ questions is effectively a way to let respondents decide what the research is trying to find out. This is not a wise research plan.

Second, they are analytically convenient, because they avoid more rigorous qualitative research approaches to analysis that require:

- collecting verifiable qualitative data
- reading it all
- defining consistent codes to apply to the data (i.e. a coding convention)
- classifying it according to these codes
- developing quantitative statistics from frequencies (i.e. counts) of these codes.

Third, they are also convenient in that they allow a ‘magical’ approach to creating quantities that can then be fed directly into numerical or statistical analyses. Unfortunately ‘convenience considerations’ have never been, nor should ever be, a key driving force of rigorous scientific methods.

Similarly, ‘wishful thinking’ is not a valid research tool, so simply hoping questions or response formulations will capture the information we desire has no bearing on whether they actually do or not. The real world is not obliged to conform to our aspirations, so the onus remains on the researcher to rigorously demonstrate that they are collecting the targeted information they claim to be.

It is also recognised that many researchers are heavily invested in these types of approaches to survey questions, and see a huge number of precedents for this type of work in the literature. Even under the weight of such precedents, and putting all this paper’s own points aside, common sense can still provide some insights here. Consider the following thought experiment:

You are a staunch supporter of using psychometrically scaled responses in research about real world factors. You are sitting at the front of a smallish plane. It is an open-cockpit design and you are close enough to the pilots to hear the radio traffic. Your ears suddenly prick up when you hear the pilot say: “Tower, this is Flight 702, we are low on fuel and will not be able to reach our original destination. Can you advise which airport we should divert to?”

There is a pause, and then you hear the control tower reply: “No problem Flight 702, we have enacted our emergency protocols for dealing with your situation, but we need more information to provide the correct advice on which airport you can make it to. So, can you tell us exactly how low on fuel you are, using the following five point scale: “exceptionally low; very low; low; a bit low; slightly low?”

Your colleague next to you, who has missed all this, chooses this moment to ask you to explain again why your research approaches are a good idea. Do you feel inclined to defend them? Why?

Sometimes it really is important to get the planes to land…

In summary, the key message from this discussion is that:

1. It is extremely easy to generate data.

2. It is much harder to generate data that captures valid information about the real world.

3. It is much harder still to capture valid information that has the meaning researchers wish to assume it does.

Unless researchers put in enough thought into their data collection to ensure they reach point 3, most subsequent analyses will deliver results that are wrong.

Again, just collecting ‘convenient data’ and hoping that it has the meaning we want is not a valid option for serious research.

In these times of ‘Big Data’ and technology-based collection tools, it has never been easier to simply generate data. However convenient these tools may be, it always remains the researchers’ responsibility not to ask ‘stupid questions’, because the world has no problem giving back ‘stupid answers’. Or, as Dr Richard Wang, Director of the MIT Chief Data Officer and Information Quality (CDOIQ) Program puts it, “Your data may be BIG, but is it any GOOD?” (Wang, 2013).

What do we do instead?

The short answer to this question should be ‘there is no instead!’ Invalid research methods should never be considered as an option. The longer answer is that by using the ‘Three ‘C’s as a standard rigour for non-psychometric research, a vast range of sounder, and often simpler, methodologies become apparent. Many of these methodologies have existed for centuries. The ‘Questionable Research Practices’ or ‘QRPs’ (Anvari & Lakens, 2018), outlined above have all crept in as poorly conceived ‘shortcuts’ to these original methodologies. A discussion of such valid methodologies is not something that can be addressed in this brief paper. In lieu of this, a simple checklist that may be used to identify issues in data quality, including these validity and replicability issues, is provided in Table 1.

Table 1. Data Quality Checklist

Data Quality Criteria	Yes/No	Data Gathering (M&E) Applicability	IT systems (Database) Applicability
1. VALIDITY/REPLICABILITY			
1.1 Do data points represent a valid measure of anything?		Is the data valid qualitative or valid quantitative information? (There are no other options! Has the Three ‘C’s test been applied?)	Is the quality of the data founded on a system of shared conventions and classifications that is rigorous enough to be defensible?
1.2 Can we unambiguously define what a data point measures?		Is our understanding of the data gathered comprehensive, or is any data point still open to various interpretations of meaning and scope?	Do data consistently fall within their allowable/possible values? Is prevention of incorrect use enforced? (E.g. preventing mathematical functions being applied to non-quantitative, ‘numerical’ data, such as phone numbers, etc.)
1.3 If the same data collection method is used under the same conditions, do we get the same result?		Have we tested our collection methods to ensure they are reliable? Do information gathering methods introduce varying biases/errors into data?	Have we tested our data input or data manipulation algorithms to ensure they are reliable? Can input or manipulation algorithms introduce varying biases/errors into data?
2. POWER			
2.1 Are we gathering the most powerful raw data feasibly available? *(power = analytic extrapolative ability)*		Are we collecting basic data that can be used to analyse a wide range of complex phenomenon, or are we gathering existing constructs that cannot be disaggregated to identify unique and meaningful, real world contributing factors?	Can each data point be mapped to a unique real world state, or are data points opaque constructs that cannot be directly identified in the real world?
3. UNIQUENESS			
3.1 Can differing or unique data be reliably identified after collection?		Do we gather appropriately disaggregated data?	Can differing or unique entries be reliably identified and accessed?
3.2 Is there inappropriate repetition of data?		Are we inappropriately double counting?	Are any entries inappropriately repeated in a dataset?

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Table 1. Data Quality Checklist *continued..*

Data Quality Criteria	Yes/No	Data Gathering (M&E) Applicability	IT systems (Database) Applicability
4. COMPLETENESS/ REPRESENTATIVENESS			
4.1 Does the sample/dataset include all necessary attributes of a factor under investigation (including time periods)? 4.3 Does the sample/dataset sufficiently reflect the ideal (fullest possible) dataset?		Have we allowed data sources/ respondents to provide us with the full picture, or are we inappropriately focusing on limited factors? This includes coverage of relevant time periods. Has the level of representativeness of the sample been calculated? Is the sample sufficiently representative to be fit-for purpose for drawing required conclusions?	Do a sufficient percentage of data fields contain data, where relevant? Do the ranges of values recorded match specific requirements. Does the dataset satisfy a level of representativeness that is fit-for purpose for drawing required conclusions?
5. PRECISION/ACCURACY			
5.1 Is the margin of error for the sample/ dataset less than the expected change being measured? 5.2 Does the data recorded match the data available to collection?		Are our techniques for measurement/ data gathering fit-for-purpose in relation to required margins of error? Are data recording methods able to reliably capture the data encountered, or are we limiting what can actually be recorded?	Does the dataset satisfy a set of specified constraints/criteria related to margins of error? Has the data been checked for input errors? Has ground-truthing been attempted?
6. SECURITY			
6.1 Are mechanisms in place to prevent unauthorized creation/access/change to data?		Can data be created, changed, accessed or manipulated inappropriately (including in relation to data falsification and confidentiality/privacy issues)? Can this be detected?	Can data be inappropriately created, accessed, changed or manipulated (including in relation to data falsification issues and confidentiality/privacy issues)? Can this be detected?

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Using Series Linking to Tackle Residential Burglary: Understanding and Enhancing Police Decision-Making

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Abstract

Series linking identifies offences likely to be committed by the same offender/s based on an analysis of where, when and how crimes are committed. This can significantly enhance the detection and prosecution of serial offenders and help the police to work in a more cost-effective way. A growing body of research supports the use of series linking with a range of crime types, but important gaps remain that limit the practical value of this work. This article describes ongoing collaborative research that seeks to build greater understanding of series linking and to enhance police decision-making when linking series of residential burglaries in New Zealand.

Serial Offenders and Serial Residential Burglary

There is considerable evidence demonstrating that the majority of crime is committed by a minority of offenders (e.g. Clarke & Eck, 2003; Tilley & Laycock, 2002). These serial offenders impose significant financial and human costs on society; for example, the estimated annual cost of serial offenders in the UK alone is £18.1 billion (Newton et al., 2019).

Burglary is no exception to this trend, with theft and acquisitive crimes often shown to have the highest rates of reoffending (Brunton-Smith & Hopkins, 2013; Ministry of Justice, 2021). Indeed, burglary costs society billions every year (Wickramasekera et al., 2015) and impacts significantly on the psychological well-being of victims, leading to fear, anxiety, anger and depression (Beaton et al., 2000; Chon & Wilson, 2016). It is, therefore, unsurprising that tackling burglary is a priority for law enforcement around the world. This includes New Zealand Police, whose core Business Objectives outline the commitment to create "safe homes" that are "free from crime and victimisation".

Series Linking

One method available to law enforcement for tackling serial offenders (including serial burglars) is series linking . Series linking identifies offences likely to be committed by the same offender/s based on an analysis of where, when and how crimes are committed (i.e. modus operandi, MO).

Linking offences in this way can bring significant benefits to law enforcement because it allows the collation of evidence from multiple investigations, which often enhances the quality and quantity of evidence available with which to detect and prosecute offenders (Grubin et al., 2001). Furthermore, combining multiple investigations and investigative teams leads to a more cost-effective and efficient use of police resources because there is less duplication of work, roles and responsibilities (Woodhams et al., 2007).

Given the potential investigative benefits, it is unsurprising that series linking is practised by law enforcement agencies across Europe, North America, Asia, Africa and Australia (including New Zealand), with linking used to assist investigations into a range of crimes, including acquisitive (e.g. burglary, robbery and car theft) and person-oriented crimes (e.g. rape and murder).

There is also a well-established body of research evidence that supports the use of series linking (e.g. Bennell & Jones, 2005; Burrell et al., 2012; Ellingwood et al., 2013; Santtila et al., 2008; Tonkin et al., 2019; Woodhams et al., 2019). This research has predominantly focused on testing whether offenders repeat (at least some of) their MO from one crime to the next (referred to as behavioural consistency) and whether it is possible to distinguish the MO of one offender from that of another offender (referred to as behavioural distinctiveness). If series linking is to work reliably and accurately during real-world police investigations, offenders need to behave in both a consistent and distinctive way (Woodhams et al., 2007). The research cited above has demonstrated that offenders display enough consistency and distinctiveness in their MO to support reliable and accurate series linking with a range of crime types, including burglary, robbery, car theft, arson, sexual assault/rape and homicide. Moreover, this research has demonstrated that it is possible to develop statistical approaches to series linking that can distinguish between linked and unlinked crimes to a high degree of accuracy.

Despite this growing body of research, there remain significant gaps in our understanding of series linking. This includes: 1) a lack of understanding regarding how series linking is conducted by police analysts (e.g. how they make decisions and what barriers they face); 2) a lack of linking research in some countries (including New Zealand); and 3) very little understanding of if/how statistical approaches can support human decision-making, which is currently the predominant method of series linking practiced internationally.

Ongoing Series Linking Research in New Zealand

This article describes ongoing research to address the three gaps identified above. This project is funded by the British Academy , comprising 3 phases of research that seek to build greater understanding of series linking and enhance police decision-making when linking series of residential burglaries in New Zealand.

Phase 1: Understanding series linking with residential burglaries in New Zealand

Objective: Phase 1 of the research aimed to understand: 1) how series linking is currently performed with residential burglaries in New Zealand; 2) the factors that promote/hinder accurate series linking; and 3) whether computerised decision-support tools might assist series linking practice.

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Methods: Thirty-nine New Zealand Police staff completed a questionnaire/interview/focus group relating to the process, challenges, products and uses of crime linkage with residential burglary in New Zealand. These data (alongside four redacted crime linkage reports) were subjected to thematic analysis.

Main Findings: Many examples of innovative series linking practice were identified within New Zealand Police, including cases where series linking made an important contribution to the investigation and prosecution of serial offenders. This demonstrates that series linking has the potential to be a valuable tool for tackling serial offending.

There were, however, several challenges and barriers highlighted that impact on the current effectiveness of series linking. There are challenges relating to data quality, data systems and processes, a lack of training in and limited understanding of series linking, and room for improvement in the way that different work groups communicate and share information for the purposes of linking.

There is also wide variation in: (i) how series linking is used during an investigation; (ii) who conducts it and how it is conducted; (iii) what data and systems are used; and (iv) how the findings are disseminated. This variation not only exists when comparing analysts from different districts, but also when comparing analysts within the same district and even when comparing analysts within the same local team.

Recommendations:

1) **When a burglary suspect is arrested, series linking should be used as a standard practice to identify other offences that might be linked to that individual,** thereby maximising opportunities to clear unsolved offences.

2) **New Zealand Police should raise awareness of series linking amongst all its work groups,** ensuring that opportunities to clear crime and generate additional leads are not missed and that the potential benefits of series linking are fully realised.

3) **Series linking training should be developed and offered as standard to all new crime/intelligence analysts and existing analysts,** thereby ensuring that good practice is shared across the organisation and that existing series linking practice is based on the best-available research evidence.

4) **All series linking products (regardless of how formal/informal they are) should be written in a way that maximises their value for the user/client** (e.g. by clearly outlining investigative leads/action points).

5) **New Zealand Police should begin exploring whether computerised series linking support tools can be developed,** as such tools have the potential to address many of the challenges identified by participants in this research.

Phase 2: Developing and testing statistical algorithms for series linking with residential burglaries

Objective: Phase 2 aimed to: 1) develop statistical approaches that use geospatial, temporal and MO information to link residential burglaries in New Zealand; and 2) test the accuracy of these statistical approaches when conducting series linking.

Methods: Geospatial, temporal and MO information relating to 500 solved residential burglaries committed across New Zealand was extracted from New Zealand Police databases. Statistical methods for generating series linking predictions were developed and their accuracy tested. The statistical approaches were used to generate ranked lists of crime pairs based on how similar the two crimes in each pair were in their geospatial, temporal and MO information. Those crimes predicted by the statistical approaches as most likely to be linked were placed at the top of the list and those predicted as least likely to be linked were placed at the bottom. Given that the 500 crimes were already solved, we were able to determine the accuracy of the statistical approaches by comparing the predictions produced by the statistics with reality (i.e. which crime pairs were genuinely committed by the same/different people).

Main Findings: Our findings clearly demonstrated that the statistical method was able to successfully prioritise linked over unlinked crime pairs. That is, the genuine linked crime pairs (containing two crimes committed by the same person) were clustered at the top of the list and the unlinked crime pairs (containing two crimes by different offenders) were clustered lower down the list. For example, the top 20 crime pairs in the prioritised list were all linked and there were only nine unlinked pairs in the top 59 pairs in the list. 70% of the linked pairs were within the top 12% of the prioritised list and 80% within the top 21% of the prioritised list.

Recommendations:

1) **New Zealand Police should explore the use of computerised decision-support tools to facilitate the linking of residential burglaries.** Such tools would help human analysts to manage the huge volume of burglary offences they face, allowing them to more quickly identify and prioritise linked crimes for further investigation. This has the potential to significantly enhance the detection and prosecution of prolific burglars in New Zealand.

2) **New Zealand Police should seek to enhance the quality of crime information stored on their databases (NIA).** This includes: (i) clearer, more explicit guidelines regarding the basic information that should be recorded for residential burglary crimes and how/where that information should be stored in NIA. This should include guidance on the key questions call handlers/investigating officers should ask when speaking to victims and guidance for SOCOs and other officers who attend crime scenes regarding what key information to record in their reports. (ii) Amendments to NIA that remove the opportunity for duplication of identical information. (iii) Amendments to NIA that provide a single place within the crime record where the most current and up-to-date record of offender MO can be recorded.

Next Steps: Phase 3- Exploring the contribution of statistical algorithms to human decision-making

Phase 3 (currently ongoing) will examine whether the statistical approaches developed in Phase 2 are able to enhance the decision-making of New Zealand Police analysts when conducting series linking with residential burglary offences. More specifically, it will compare the decision-making of analysts who are linking using 'business as usual' methods to the decision-making of analysts who are given output from the statistical approaches that is designed to help them identify linked series more quickly and accurately.

To maximise the value of the project to New Zealand Police, we are keen to recruit as many participants as possible. If you or colleagues would like to contribute to this ongoing research, please contact Matt Tonkin (mjt46@leicester.ac.uk).

Conclusion

Series linking has the potential to significantly enhance the detection and prosecution of those prolific offenders who impose the most harm on society. It is a versatile technique that can be used to address a wide range of offending behaviour, with a strong body of evidence underpinning its use. Indeed, this research has identified numerous examples where series linking has contributed to the detection/prosecution of serial offenders across New Zealand. There are, however, several challenges facing analysts involved in series linking. These challenges are not insurmountable, though, and our research has identified several ways in which collaborative work between law enforcement agencies and researchers can begin to address these challenges. Such collaboration has the potential to produce new methods of series linking that will save the Police time and money, whilst also enhancing investigative outcomes.

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Bringing Intelligence-Led Policing to Crime Hot Spots: The Logan Experiment

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Background

This executive summary provides an evaluation of Operation Revelstoke, which was conducted by the Queensland Police Service with support from Griffith University to bring an innovative Intelligence-Led Policing strategy to persistent crime hot spots in the Logan District. The research team consisted of: Senior Sergeant Emma Thomson, operational leader of the QPS Tactical Crime Squad (TCS); Associate Professor Justin Ready who guided the planning and evaluation of the operation; and QPS Analyst Murray Ives who provided data and analytic support.

In this report we: 1) review the literature that serves as the guiding framework for Operation Revelstoke; 2) discuss the methods used to implement and assess the impact of Operation Revelstoke; 3) present research findings on crime incidents (QPRIME) and calls for service (QCAD) occurring in treatment and control areas during the study period; and 4) conclude with recommendations for integrating this strategy into BAU for frontline units across the Queensland Police Service.

Literature Review

Intelligence-Led Policing

The current policing environment in Australia and abroad has been described by Temple University Professor Jerry Ratcliffe (2016) as being information rich but knowledge poor. The insufficient use of intelligencei has led police leaders to call for greater use of data and criminal intelligence for shaping priorities and operations – an approach defined as Intelligence-Led Policing (ILP). Police organisations increasingly have access to data sources that provide real-time information relating to crime hot spot locations, repeat victimizations, domestic violence, and prolific offenders.

To date, many applications of intelligence-led policing have been reactive operations designed to either provide tactical case support or to augment traditional policing strategies. Studies of these police interventions have found that ILP increases efficiency and crime control benefits (Telep, Ready and Bottema, 2017). However, the intent of ILP is to re- prioritize police resources so that intel is used for proactive strategic planning rather than reactive tactical support. Operation Revelstoke seeks to optimize the deployment of the Tactical Crime Squad by proactively using intelligence resources in the 1 percent of crime hot spots that experience the highest concentration of violent, public order, and vehicle-related crimes in the Logan District.

Focus on Micro-Locations

Just as there has been a shift toward intelligence-led policing in the past decade, there has also been a significant change in how police patrol operations are conducted. Police are moving away from relying solely on random preventive patrol. The Minneapolis Hot Spots Experiment found greater benefits to police when patrol resources were more geographically focused (Sherman and Weisburd, 1995). The theoretical premise of hot spots policing is that crime clusters over time in small geographic locations. Sherman, Gartin and Buerger (1989) found that 3 percent of addresses produced about 50 percent of all CAD incidents in Minneapolis.

This research also found that 5 percent of addresses accounted for 100 percent of calls for serious crime such as robbery, sexual assault, and vehicle theft. Similarly, Spelman and Eck (1989) found that 10 percent of victims account for 40 percent of all victimisations in a given police jurisdiction. These findings provide empirical support for the proposition that places, particularly micro-locations, are important for reducing crime.

The hot spots policing approach is built on the premise that police resources, such as patrol, can be used more efficiently to reduce crime by directing frontline officers and tactical operations to locations where crime is disproportionately concentrated. Braga and colleagues (2012) sought to examine the effectiveness of hot spots policing approaches on crime in a systematic review of the literature. Their review concluded that 20 of 25 hot spots policing evaluations found significant crime reduction effects.

Further, Koper's (1995) analysis found that crime deterrence effects were greatest when police officers engaged in proactive visits to hot spots that were 15 minutes in length. This length of time resulted in the longest residual deterrence effect after officers departed from the area. Importantly, research by Weisburd, Hinkle, Famega and Ready (2011) also revealed that proactive tactics at crime hot spots did not negatively affect public opinions of police legitimacy and trust among ethnic minority groups.

Targeting Street Segments

It is sometimes the case that police interventions focusing on whole communities can be too broad and lacking in focus, which can make it difficult for police to ensure sufficient dosage or treatment integrity to treatment areas. On the other hand, police operations that target specific offenders or addresses are prone to ethical constraints. They

may also be so narrowly focused that it is a challenge to make the intervention period long enough, or the treatment group large enough, to detect treatment effects. In light of these practical concerns, there is increasing evidence that targeting street segments may be an optimal strategy for a number of reasons that benefit the police.

From a police operations standpoint, street segments are small behavioural settings that allow police to disrupt criminal networks and strengthen guardianship near vulnerable targets. Street segments also have discrete physical boundaries which create defensible spaces (Newman, 1976) and a sense of ownership among those who reside in those areas.

Finally, street segments are small enough to enable officers to apply sufficient dosage and treatment integrity during operations, optimizing the residual deterrence effect of police after they have departed from the treatment areas.

Research has also shown that unique trends in anti-social behaviour occur on street segments. These trends vary greatly from larger communities. As a result, crime-ridden communities often contain street segments that experience little to no crime, and safe communities often include street segments with high crime concentrations. Research conducted in Seattle and Baltimore found that half of all CAD incidents (i.e., calls for service) for indictable crimes were found on just 5 percent of street segments in the city. Some Australian scholars have speculated that crime does not concentrate to the same extent in Australian cities.

To date, there is little published work on the degree to which crimes concentrate on street segments in Australia, or the impact of dedicating crime intelligence resources to micro-locations in Queensland. Therefore, we ask two questions. Can the research findings about crime clustering on street segments be generalized to Australian cities, and to the Logan District specifically? And, if so, could this analysis provide a location- based tasking framework for the deployment of unassigned frontline units to micro-locations in Queensland?

Methods

The first stage in planning the operation was to examine QPRIME data from the Logan District and LEAP data from the South Metro Region, Victoria to determine the extent to which crime concentrates at street segments in Australia. Analysing data from two jurisdictions provided a reliability check on QPS data and improved our ability to generalize the research findings to other jurisdictions. For the purpose of this study, we defined a street segment as a length of street between two consecutive street intersections, including both sides of the street (i.e., block faces).

Our analysis focused on three crime categories which included violent/person-on-person, public order, and vehicle-related crimes. These categories were selected because they are consistent with the strategic priorities and operational focus of the TCS. We did not include domestic violence because the focus was placed on crimes occurring in public spaces.

Crimes occurring over a two-year period were geocoded and aggregated to street segments in the two jurisdictions. We examined one year of data before the COVID-19 pandemic and one year after to control for potential period effects. The findings on spatial clustering were noteworthy. Fewer than 1 percent (0.7%) of street segments produced 22 percent of all crimes in both jurisdictions, and fewer than 5% of street segments accounted for 50% of all crimes. Remarkably, 63 percent of street segments did not produce one serious crime over the study period.

The second stage of planning was to develop criteria for identifying street segments as crime hot spots. These criteria included: 1) 20 or more QPRIME incidents occurring on the street segment within a one-year period; 2) 20 or more calls for service (QCAD) occurring on the street segment within a one-year period; 3) crime and QCAD incidents must occur on the street segment in half of all fortnights of the year to show that crime is stable; and 4) street segments containing a facility or public service that artificially inflates the crime count (e.g., hospital or police facility) must be removed from the analysis (these places may be used as a default location for geocoded data).

Based on the criteria, we identified a total of 41 street segments in the Logan District that satisfied the hot spot requirements, and 247 street segments qualified in South Metro Region, Victoria. The proportion of street segments that qualified as hot spots across the two police jurisdictions was notably similar (0.7%), especially when you consider the population of the two areas (335,000 and 1,200,000, respectively). Hot spot street segments in both jurisdictions produced about 22% of all crimes.

The last stage of planning was to randomly assign the 41 street segments that qualified as hot spots in the Logan District to treatment and control conditions. Random assignment to treatment and control groups served two purposes. First, it enabled the Tactical Crime Squad and intelligence resources to be focused on only half of the areas, increasing police presence and intelligence capabilities (i.e., dosage) on the street segments where the operation would take place. It also allowed us to generate an "equivalent" control group which would serve as a baseline for comparison purposes. As a result, the evaluation of Operation Revelstoke was designed as a randomized controlled trial (RCT) which is considered the gold standard in evaluation research (Sampson, 2010).

Because the number of street segments that qualified as crime hot spots in the Logan District was relatively small (n=41), we used a block randomization procedure to ensure that random assignment produced two equivalent groups of street segments. Specifically, we matched each street segment that qualified as a hot spot with another one that was identical in terms of crime volume, physical disorder, design/layout, and population density. Crime volume was measured based on QPRIME data; the other pieces of information were obtained from systematic observations conducted in each of the hot spots.

The research team spent 30 minutes carefully documenting the features of each street segment by walking to multiple viewing areas and coding specific items on the systematic observation survey. The items included indicators of urban blight; signs of disorder such as boarded-up buildings, litter, graffiti, broken windows, drug paraphernalia and abandoned vehicles; structures that attract anti-social behaviour (e.g., bars and bus stops); and the number of residential and non-residential (i.e., commercial) buildings.

Continued on next page

An identical match was found for 20 of the 41 street segments (10 pairs); the remaining street segments were excluded from the RCT. In the final stage of planning, one hot spot from each pair was randomly allocated to the treatment group and one to the control group. The final 20 street segments included in Operation Revelstoke are shown in Figure 1. In sum, all 20 street segments below qualified as crime hot spots and the ten pairs were matched based on identical levels of crime, physical disorder, layout, and population density.

Figure 1: Block Randomization to Treatment and Control Conditions

	Treatment Group	Control Group
Pair 1	Bramston from North to End	Merron from Ellen to End
Pair 2	Outlook from Clearview to Cunningham	Forest from Hague to End
Pair 3	North from Defiance to Waratah	Garfield from Charles to Connor
Pair 4	Cognac from Velorum to End	Loganlea from Armstrong to Logandowns
Pair 5	Milky Way from Jacaranda to End	Logandowns from Logan Downs to Loganlea
Pair 6	Defiance from Croydon to North	Blackwood from Croydon to Ewing
Pair 7	Ewing from Albert to Targa	Blackwood from Croydon to North
Pair 8	Station from Carmody to Craydon	Wembley from Wembley to Wilbur
Pair 9	Station from Croydon to North	Henty from Wills to End
Pair 10	Andella from Omar to Smith	Whitey from North to Wisp

After the block random assignment to treatment and control groups was completed, we conducted a series of statistical tests to confirm that the treatment and control areas were equivalent (i.e., comparable in terms of their social and physical characteristics). The t-tests in Figure 2 indicate that there were no statistically significant differences between the two groups based on QPRIME crimes, residential buildings, non-residential (i.e., commercial) buildings, structural disrepair, and physical disorder on streets and sidewalks.

Figure 2: Comparison of Treatment and Control Areas (After the Matching Procedure)

	Treatment Group Average	Control Group Average	T-tests (no significant differences)
Total (QPRIME) crimes	37.7	47.5	P=.39 (t=-.87)
Violent crimes	5.1	7.2	P=.21 (t=-1.29)
Vehicle-related crimes	23.3	31.8	P=.33 (t=-.98)
Public order incidents	9.3	8.5	P=.75 (t=.33)
Total buildings	14.3	13.0	P=.70 (t=.39)
Non-residential buildings	3.6	2.7	P=.63 (t=-.49)
Disrepair (buildings)	6.0	6.4	P=.81 (t=-.24)
Physical disorder (sidewalks)	18.3	16.7	P=.14 (t=1.5)

The Operation: Bringing Intelligence-Led Policing to Crime Hot Spots

On a strategic level, Operation Revelstoke: 1) identified 'hot spot' street segments in the Logan District that had serious and persistent crime problems; 2) provided ongoing intelligence support to the Tactical Crime Squad (i.e., weekly intelligence briefs) for each hot spot; and 3) deployed the TCS to these locations based on new and emerging intelligence (e.g., relating to high-impact offenders, criminal networks, active investigations, warrants and repeat victimizations). On a tactical level, this enabled the TCS to make extended patrol visits to the hot spots (15 minutes, usually out of the vehicle) and optimize residual deterrence occurring after their departure. While in the areas, the TCS followed up leads, disrupted groups engaging in unlawful behaviour, and strengthened social ties with residents and business owners.

During the 8-week intervention period (1 Oct-25 Nov 2019), the TCS conducted a total of 808 extended patrol visits to crime hot spots assigned to the treatment group (Figure 3). It is important to note that no intelligence briefs were provided to the TCS about hot spots assigned to the control group. These locations were not disclosed to the TCS. However, general duties officers responded to CAD jobs and maintained the same patrol presence in the control areas. It was business as usual in those locations, which will serve as the baseline for the analysis that follows.

Figure 3. TCS Activity/Visits to Crime Hot Spots during Operation Revelstoke (1 Oct-25 Nov)

Date	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9	O 10	O 11	O 12	O 13	O 14	O 15	O 16	O 17	O 18	O 19
TCS Visits	16	25	14	19	5	19	15	21	24	13	18	27	10	17	3	17	7	20	17

Date	O 20	O 21	O 22	O 23	O 24	O 25	O 26	O 27	O 28	O 29	O 30	O 31	N 1	N 2	N 3	N 4	N 5	N 6	N 7
TCS Visits	18	10	21	18	11	2	6	21	17	9	14	13	22	12	17	13	5	12	8

Date	N 8	N 9	N 10	N 11	N 12	N 13	N 14	N 15	N 16	N 17	N 18	N 19	N 20	N 21	N 22	N 23	N 24	N 25	Σ
TCS Visits	7	8	11	16	24	14	3	19	23	11	12	15	13	10	14	15	13	21	808

Findings

Figure 4 examines crime incidents occurring during and after the implementation of Operation Revelstoke. Specifically, the analysis compares street segments in the treatment group to those in the control group, as well as all other street segments in the Logan District.

The analysis focuses on the QPRIME categories that were specifically targeted by the operation, including violent, public order and vehicle-related crimes. The findings show a 23.2 percent reduction in crime incidents occurring in the treatment areas compared to a 50.0 percent increase in crime incidents occurring in the control areas and a 36.6 percent increase in crime across the entire district.

Bringing intelligence-led policing to crime hot spots appears to have a significant lagged effect on crime in the treatment areas. The delayed effect may be explained by the uptake time required to develop and integrate location-specific intelligence into Tactical Crime Squad's daily operations (i.e., Business as Usual). As a reliability check on the findings, we replicated the analysis using all QPRIME crime categories.

The fairly short length of the intervention and post-intervention periods could potentially create instability in the data when only examining a narrow range of QPRIME categories. The analysis in Figure 5 was carried out in order to address this possibility.

Figure 4. Crime Incidents Occurring During and After the Implementation of Operation Revelstoke: (QPRIME: Violent, Public Order and Vehicle-Related Crimes)

	Intervention Period (8 weeks)	Post Intervention (8 weeks)	Percent Change
Treatment Group (targeted segments)	56	43	-23.2%*
Control Group (block randomized segments)	38	57	50.0%
Logan Central (all other segments)	1006	1374	36.6%

*p < .05

Figure 5 shows a similar pattern of research findings when considering all QPRIME crime categories. While there was a 16.3 percent reduction in all crimes occurring in hot spots treated by the TCS as part of Operation Revelstoke, the control and district-wide trends revealed a 20.4 percent and 29.5 percent increase in crime, respectively. In short, the intelligence-led policing operation in the Logan District resulted in a 16-23 percent drop in crime at micro-locations, with slightly larger effects for serious crime. The upward trends occurring both district-wide and in the comparison hot spots suggest that a similar trend is likely to have occurred in the treatment areas without the introduction of Operation Revelstoke. It is worth noting that we observed a 16.7 percent increase in (QCAD) calls for service in the treatment areas compared to a relatively stable volume of calls in the control and district-wide areas (-5.6 percent and +3.3 percent, respectively). This increase in calls to the police after the implementation of Operation Revelstoke may be a reasonably expected by-product of greater police presence and, perhaps, confidence in the police in the treatment areas.

Figure 5. Crime Incidents Occurring During and After the Implementation of Operation Revelstoke: (QPRIME: All Crime Categories)

	Intervention Period (8 weeks)	Post Intervention (8 weeks)	Percent Change
Treatment Group (targeted segments)	92	77	-16.3%*
Control Group (block randomized segments)	98	118	20.4%
Logan Central (all other segments)	2090	2706	29.5%

*p < .05

The last set of findings are displayed in Figure 6. This two-way Analysis of Variance (ANOVA) provides a significance test that examines the effects of the intervention independent from any period effects. The treatment effects observed in the ANOVA table suggest that it is highly unlikely (p < .0001) that the findings can explained by random chance or sampling bias. In other words, the effects of Operation Revelstoke are statistically significant after controlling for district-level fluctuations in crime.

	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2208.859[a]	5	441.772	26.678	.000
Intercept	4697.097	1	4697.097	283.656	.000
Treatment	2055.826	2	1027.913	62.075	.000
Period	2.549	1	2.549	.154	.695
Treatment * Period	31.299	2	15.650	.945	.389
Error	32273.710	1949	16.559		
Total	48028.000	1955			
Corrected Total	34482.570	1954			

R Squared = .064 (Adjusted R Squared = .062)

Proposed Recommendations

We propose several recommendations that follow from this executive summary. First, there is ample capacity to upscale intelligence-led policing at micro-locations through the replication of Operation Revelstoke in other police jurisdictions. Relatedly, our second recommendation is for QPS leadership to consider the District Tasking and Coordination Centre (DTACC) as a promising platform for sharing location-specific intelligence with frontline units and creating a uniform process that delivers real-time information to these units and makes optimal use of their discretionary time.

Finally, our third recommendation is for the QPS to consider further analysis of street segment level data to better understand crime concentration at micro-locations. This may contribute to better situational awareness for frontline units and could also serve as a starting point for developing a mobile application that can better empower officers to prevent crime in micro- locations during their discretionary time.

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i Crime intelligence is defined here as analysed information that blends data from crime patterns and hot spots with criminal intelligence drawn from the behaviour of offenders, used for the purpose of establishing strategic priorities and allocating policing resources.

Figure 6: Two-Way ANOVA Tests of Between-Subjects Effects