Lawyers and DNA:

Understanding and Challenging the Evidence

by

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Statements and Declarations

Declaration of Originality

This thesis contains no material which has been accepted for a degree or diploma by the University or any other institutes, except by way of background information and duly acknowledged in the thesis, and to the best of my knowledge and belief no material previously published or written by another person except where due acknowledgement is made in the text of the thesis, nor does the thesis contain any material that infringes copy right.

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Statement of Ethical Conduct

The research associated with this thesis abides by the international and Australian codes on human and animal experimentation, the guidelines by the Australian Government's Office of the Gene Technology Regulator and the rulings of the Safety, Ethics and Institutional Biosafety Committees of the University.

Statement of Publication

This research was introduced in the following peer-reviewed research paper:

Kate Cashman and Terese Henning, 'Lawyers and DNA: Issues in Understanding and Challenging the Evidence' (2012) 24 (1) *Current Issues in Criminal Justice* 69.

It does not form part of the text or Appendix of this thesis.

Katherine Cashman October 2017

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I dedicate this thesis to Cubba — my late grandfather, Stewart 'Buster' Cavill. His thirst for knowledge and love for me went hand in hand and they have shaped so much of who I am today. I hope he would have been proud.

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Abstract

Multi-disciplinary research into the use of forensic evidence in the criminal justice system allows for greater understanding of the processes employed by professionals from the crime scene through to the courtroom. Courts have accepted DNA evidence as robust and reliable forensic evidence for over 30 years. More recently, however, there have been investigations into miscarriages of justice and other criminal cases that demonstrate the risks of assuming that DNA evidence is unproblematic. These cases have identified a failure by lawyers to challenge and understand this type of evidence. Criminal lawyers must ensure that DNA evidence, like all evidence, is explained correctly to the court and given the appropriate weight by the fact-finder. Lawyers have been criticised not only for a lack of understanding of DNA evidence but also for their lack of effective communication with expert witnesses.

This thesis explores how lawyers understand and challenge DNA evidence in criminal trials in Victoria and the Australian Capital Territory (ACT). Until this study was conducted, Australian lawyers had not been consulted about the criticisms directed towards the profession in Australian and international forensic reports. Nor had they been asked about their practical experiences in managing DNA evidence in an adversarial criminal justice system. The research for this thesis makes an original contribution to the field of forensic and legal studies in several ways. It shares these practical experiences, uncovers the tensions that exist in using DNA evidence in an adversarial legal system, assesses the greatest areas of difficulty for lawyers and judges in dealing with DNA evidence and evaluates current education initiatives aimed at improving lawyers' knowledge of DNA evidence. This research also reveals how the organisational culture of professionals within an adversarial legal system influences their use of DNA evidence in criminal trials.

This thesis analyses these experiences within a legal context. In exploring how lawyers manage and use DNA evidence, this thesis seeks answers to two primary research questions. First, what are lawyers' understandings of DNA evidence and what difficulties do they have in dealing with this type of evidence in criminal trials?; and second, what training opportunities and resources are available to lawyers on DNA evidence and what are lawyers' views about the value of those opportunities and resources?

Forty practising criminal lawyers were interviewed for this qualitative study. The lawyers were drawn from several sources — both private and governmental organisations, law firms and the Private Bar in Victoria and the ACT. The perspective of those who observe or interact with criminal lawyers who use

DNA evidence in criminal cases was also important. Judges overseeing criminal cases and forensic scientists who present DNA evidence in court also took part in a series of focus groups. These groups are qualified to reflect on how criminal lawyers present and use DNA evidence both pre-trial and in the courtroom.

This is the first qualitative study to apply a criminological and legal lens to the practical use of DNA evidence in an adversarial criminal justice system. The results reveal that most lawyers understand the investigative procedures for DNA evidence and the chain of evidence requirements for DNA evidence — those areas where error is most likely to lead to miscarriages of justice. More significantly, the results suggest that a lack of competence is not the only explanation for lawyers' mismanagement or miscommunication of DNA evidence in criminal trials.

This thesis argues that cultural and systemic explanations for lawyers' disengagement with DNA evidence and choice to avoid communication with forensic scientists about this evidence should be considered when assessing lawyers' roles in relation to it. The adversarial nature of the Australian criminal justice system influences lawyers' practice and how they learn about DNA evidence. Continuing legal education (CLE) providers do not always provide information that is relevant and accessible to lawyers when they have the greatest need for this information in their daily practice. This thesis makes recommendations for the development of education programs on DNA evidence for lawyers. These and other recommendations recognise and consider how lawyers best learn about complex evidence and the type of learning environment they are most likely to engage with.

1 Introduction

1.1 Introduction and rationale

In 2009, the National Academy of Sciences Report *Strengthening Forensic Science in the United States: A Path Forward* [1] (NAS Report) in the United States was published and the miscarriage of justice in *R v Jama*[2] was exposed, investigated and presented in the *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama*[3] (Vincent Report). Both reports recommended that lawyers improve their knowledge of forensic evidence, and in Jama's case, DNA evidence specifically. The key criticism? That lawyers do not know enough about DNA evidence to examine and cross-examine experts competently or pick up errors pre-trial.

This thesis seeks to answer the question of how to achieve the recommendations made in the NAS and Vincent Reports in order to create lasting change in policy and education on DNA evidence, change that will benefit lawyers and that will improve their practice with DNA evidence in criminal trials. This is the first research project to ask lawyers about their everyday practice with and use of DNA evidence. With this knowledge, policy makers and educators can implement necessary initiatives to reduce the problems identified in the NAS and Vincent reports.

The core of this research is formed by consultation with three key data sets with two jurisdictions. The first is interview data obtained from Victorian and Australian Capital Territory (ACT) criminal lawyers. The second is focus group data obtained from forensic scientists who test and analyse DNA evidence in the laboratory and work with lawyers as expert witnesses. The third data set was obtained from focus groups with judges in Victoria and the ACT who arbitrate cases and oversee lawyers using DNA evidence. Participants came from these jurisdictions because of Victorian and ACT research partners funding the core research grant for this project.[4]

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1 National Research Council Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) National Academy of Sciences <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>.

2 *R v Jama* [2008] VCC 0886.

3 Frank Vincent, *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (2010) Parliament of Victoria <http://www.parliament.vic.gov.au/papers/govpub/VPARL2006-10No301.pdf>.

4 See project information at Tasmanian Institute of Law Enforcement Studies, *Effectiveness of Forensic Science in the Criminal Justice System* (13 April 2016) University of Tasmania <http://www.utas.edu.au/tiles/research/current-projects2/the-effectiveness-of-forensic-science-in-the-criminal-justice-system>.

This research may be distinguished from other studies because it focuses on the practical use of DNA evidence by lawyers and provides insight into how and why lawyers act the way that they do in relation to this evidence. It uncovers the practical realities and tensions that lawyers face between how they 'should' use DNA evidence and how they do use DNA evidence. This thesis presents crucial information for lawyers, policy makers and educators to close the gap between 'ideal' practice and how lawyers really work. Its aim is to assist in the prevention of further miscarriages of justice in Australia resulting from lawyers' misunderstanding, incompetent handling or misuse of DNA evidence.

All defendants have the right to a fair trial. Miscarriages of justice clearly subvert that right. Innocent people may be convicted of crimes and this undermines community faith in the criminal justice system. Lawyers and the courts must understand DNA evidence so that cases with inadequate or substandard evidence do not progress to unsafe convictions. The legal profession has a responsibility to ensure that DNA evidence is sound and justifiably admitted in trials. Having an understanding and working knowledge of DNA evidence is important in ensuring they uphold that this responsibility.

1.2 Overall research project and industry partners

The research for this thesis was undertaken as part of an Australian Research Council (ARC) Linkage Project called 'The Effectiveness of Forensic Science in the Criminal Justice System'[5] with the Tasmanian Institute of Law Enforcement Studies at the University of Tasmania.[6] Industry partners who supported this research were Victoria Police, the Australian Federal Police and the National Institute of Forensic Science, as well as the academic partners, the University of Technology, Sydney and the University of Lausanne, Switzerland.

1.3 Overview of thesis and its potential contribution

This thesis involves an interdisciplinary investigation into the relationship between scientific and legal milieus. It is crucial to introduce and explain the relevant features of both disciplines to understand the context in which this research took place. Chapter 2 locates this research within existing research and the problems with DNA evidence identified in criminal cases. Previous research and case law suggest that there is room for improvement in lawyers' knowledge and use of DNA evidence. Formal

[5] See Chapter 4 for more information on the research grant and overall project.

[6] University of Tasmania, *Research* (6 November 2014) Tasmanian Institute of Law Enforcement Studies <www. utas.edu.au/tiles/research>.

reviews like the NAS and Vincent reports also provide justification for this investigation as they urge lawyers to improve their knowledge of DNA evidence.

Chapter 3 then introduces forensic science as a discipline and DNA evidence as expert opinion evidence under the framework of the Australian uniform evidence legislation.[7] It then explains the adversarial legal system that Victorian and ACT criminal lawyers work within. This chapter also demonstrates the importance of lawyers' understanding of DNA evidence as part of the right to a fair trial under domestic and international law. Finally, the ACT and Victorian rules governing criminal procedure are introduced.

For this research, a qualitative research study was designed to gather the personal experiences and insights of lawyers, forensic scientists and judges who work with DNA evidence. Chapter 4 explains the methodology used including the interpretive paradigm employed, the rationale for using a qualitative approach and the research questions underpinning this project. Analysis was assisted by Computer Assisted Qualitative Data Analysis (CAQDAS) software and checks on the validity and reliability of the qualitative research ensured rigour and transparency.

Chapter 5 is the first of the data and analysis chapters. it provides an explanation of how the legal culture of working within an adversarial system influences the everyday practice of lawyers when they use DNA evidence. The 'realities' that lawyers face in using and understanding DNA evidence is presented in this chapter. It is important to explore these realities for Victorian and ACT lawyers, in order to ensure that the recommendations made in Chapter 8 are relevant and realistic both theoretically, for academics, policy makers and educators, and practicably, for lawyers in practice.

Chapter 6 presents data and analysis on the difficulties lawyers experience with DNA evidence. This chapter is divided into three sections. The first section explains and explores in detail the difficulties that lawyers have with the scientific principles of DNA evidence. The second section deals with difficulties identified in pre-trial and trial procedure and the third section explores difficulties they encounter with the communication of DNA evidence in written reports, in explaining DNA evidence in court and in asking the right questions of forensic biologists as expert witnesses.

The NAS and Vincent reports criticised lawyers for their lack of knowledge and misuse of DNA evidence and therefore recommended that lawyers should invest in further education in this area. For this thesis, this prompted an investigation of the educational options currently available to lawyers in

[7] Those Acts included in the uniform evidence schedule are the following: *Evidence Act 1995* (Cth); *Evidence Act 2004* (Norfolk Island); *Evidence Act 1995* (NSW); *Evidence (National Uniform Legislation) Act 2011* (NT); *Evidence Act 2001* (Tas); *Evidence Act 2008* (Vic). The *Evidence Act 1995* (Cth) applies in the ACT.

Victoria and the ACT. These are presented, analysed and compared with educational offerings elsewhere in Australia and overseas in Chapter 7. Formal and informal sources of education are explained and lawyers' views of their own experience with Continuing Professional Development (CPD) are presented.

Conclusions and recommendations are presented in Chapter 8. This chapter brings together the threads of the earlier chapters by revisiting research questions and summarising how each of the chapters has answered them. Two general recommendations are made. The first reiterates that change can and will only occur if relevant information and resources that help lawyers to learn about DNA evidence are available to them on a case-by-case basis. Those who educate lawyers need to consider how adults, and specifically lawyers, learn about new information. It is also clear that information to support knowledge acquisition must be available in various formats including via direct communication with experts or other lawyers, from online sources and texts or journal articles on relevant topics. The second recommendation aims to achieve improved communication between lawyers and experts by suggesting that greater opportunity be provided for both prosecution and defence lawyers to form relationships with forensic scientists and gain greater confidence in asking questions about DNA and other forensic evidence. These recommendations reference the analysis presented in chapters 5, 6 and 7 and the data obtained from interviewees and focus group participants. Special care must be taken to implement initiatives that take into account how lawyers work in an adversarial system on a case-by-case basis.

1.4 Unique contribution

This thesis offers original insights because it makes both a practical and theoretical contribution to existing knowledge in this area. It assists lawyers by presenting relevant information on DNA evidence and various educational programs and materials available both online and in person. The thesis may provide a framework for lawyers to improve their knowledge and use of DNA evidence in the trial context. This research has theoretical and practical relevance because it identifies the practicalities, difficulties and logistical issues faced by lawyers in Victoria and the ACT in using DNA evidence. It also provides some explanation as to why miscarriages of justice like that which occurred in *Jama* continue to happen, despite an increase in the lawyers' knowledge about DNA evidence. By identifying the current opportunities for lawyers to engage in DNA evidence education and by assessing the usefulness of these training opportunities, this thesis recommends and promotes an evidence-based approach to educating lawyers.

1.5 Conclusion

This thesis introduces cases in Chapter 2 that demonstrate that DNA evidence remains problematic in Victoria and the ACT. These cases, and subsequent investigation and reporting on their outcomes provide the rationale for the research presented in this thesis into how lawyers understand and deal with DNA evidence. This thesis explains, however, that it is not merely a lack of understanding that influences lawyers' behaviour in dealing with DNA evidence. Legal culture and tensions arising from working within an adversarial system also shape lawyers' approach to this evidence. Although legal culture cannot excuse misuse or misunderstanding of DNA evidence, it can provide insight into how lawyers might improve their communication skills with forensic biologists and so obtain greater knowledge of that evidence. Lawyers needed to be asked about education on DNA evidence as well and given the ability to respond to criticisms of their level of knowledge and how legal education works in practice for criminal lawyers.

Chapter 2 explores the justification for the research questions explored in this research. It discusses the previous research that has been conducted in this area, formal reports produced by research bodies and independent legal commissioners and the relevant case law from Victoria and the ACT in this area.

2 Justifications for the research

2.1 Introduction

This chapter introduces the previous research on lawyers in the field of forensic science, forensic scientists and their views of lawyers using DNA evidence, judges understanding and the impact of the evidence on jurors. It also explores case law involving DNA evidence and reports into miscarriages of justice and the use of forensic evidence in criminal cases, all of which provide justification for this study on lawyers' perceptions and management of DNA evidence in criminal cases. Research in this area crosses the divide between the forensic and legal worlds. However, there has been little research that focuses on lawyers' perceptions and management of DNA evidence within the criminal justice system. The research to date suggests that lawyers lack comprehensive understanding of DNA evidence, they have a lack of confidence in dealing with DNA evidence and they fail to communicate effectively with DNA experts pre-trial. These topics comprise the central components of this study. Analysis of Australian Capital Territory (ACT) and High Court case law over the last five years provides evidence of confusion by lawyers and the legal system about DNA analysis generally, probability ratios and statistics.[1] This influenced the research and interview questions on probability ratios and statistics and prompted investigation into the areas that lawyers found difficult to understand in practice.

Major investigations into, and consequent reports about, miscarriages of justice in cases involving DNA evidence have recommended that lawyers need to improve their knowledge and understanding of DNA evidence. These recommendations provide an important justification for this study. The chapter begins by introducing relevant previous research with lawyers, juries, forensic scientists and the judiciary, and DNA evidence more generally. It continues with a summary of the case law with issues arising in the areas of expression of DNA evidence using probability ratios and statistics and the relationships between the standard of proof and how lawyers manage DNA evidence in their criminal cases. Finally, it introduces formal reviews of the forensic process in this area, including the *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (Vincent Report)[2] into the *Jama* case in Victoria,[3] the *Strengthening Forensic Science in the United States: A Path Forward*

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1 A review of Victorian case law suggests that this is not as great an issue with DNA evidence in that jurisdiction, but the miscarriage of justice in *R v Jama* [2008] VCC 0886 provides more than adequate justification for research to be conducted into the use of DNA evidence in criminal trials in Victoria.

2 Frank Vincent, *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (2010) Parliament of Victoria <http://www.parliament.vic.gov.au/papers/govpub/VPARL2006-10No301.pdf>.

3 *R v Jama* [2008] VCC 0886.

repot (NAS Report) in the United States[4] and other relevant Australian and overseas Royal Commissions and reports.

2.2 Previous research

Research on the use of DNA evidence in criminal cases is slowly becoming more widely published in the legal and forensic science literature in Australia and overseas. Recent studies have investigated jurors' perceptions pre- and post-trial of DNA evidence,[5] forensic scientists' opinions of lawyers' understanding of DNA evidence,[6] and criticisms by the judiciary on how lawyers examine and cross-examine expert witnesses, including forensic biologists in criminal trials.[7] Fewer studies have investigated lawyers' experiences with DNA evidence.[8] Nevertheless, existing research does suggest that there is room for improvement in lawyers' knowledge and management of DNA evidence.

The research questions investigated in this study[9] were constructed on the basis of prior research in this area as it consistently suggests that although lawyers and jurors attach a high level of importance to DNA evidence, they often lack understanding of that evidence, or in the case of lawyers, deal with the evidence unsatisfactorily. The combined effect of earlier research suggests that lawyers are not performing their role competently in introducing DNA experts and their evidence to the court. Moreover, this appears to be a view held not only by other participants in the trial process — jurors, expert witnesses and judicial officers — but also by lawyers themselves. The relevant studies are discussed below and their implications for lawyers and the present research are considered.

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4 National Research Council Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) National Academy of Sciences.

5 Jane Goodman-Delahunty and Lindsay Hewson, 'Improving Jury Understanding and Use of Expert DNA Evidence' (2010) 37 *AIC Reports, Technical and Background Paper Series*, 1–68; Rhonda Wheate, *Jury Comprehension and Use of Forensic Science* (D Phil Thesis, University of New South Wales, Australian Defence Force Academy, 2007); Lisa Smith, Ray Bull and Robyn Holliday, 'Understanding Juror Perceptions of Forensic Evidence: Investigating the Impact of Case Context on Perceptions of Forensic Evidence Strength' (2011) 56(2) *Journal of Forensic Sciences* 409; Michael Briody, 'The Effects of DNA Evidence on Sexual Offence Cases in Court' (2002) 14(2) *Current Issues in Criminal Justice* 159; Michael Briody, 'The Effects of DNA Evidence on Homicide Cases in Court' (2004) 37(2) *Australian and New Zealand Journal of Criminology* 231.

6 Wheate, above n 5.

7 Ian Freckelton, Prasuna Reddy and Hugh Selby, *Australian Judicial Perspectives on Expert Evidence: An Empirical Study* (The Australian Institute of Judicial Administration Incorporated, 1999); Briody, 'The Effects of DNA Evidence on Sexual Offence Cases in Court', above n 5; Briody, 'The Effects of DNA Evidence on Homicide Cases in Court', above n 5.

8 Victoria Grace et al, *Forensic DNA Evidence on Trial: Science and Uncertainty in the Courtroom* (ISCE Publishing, 2011); Mark Findlay and Julia Grix, 'Challenging Forensic Evidence? Observations on the use of DNA in Certain Criminal Trials' (2003) 14(3) *Current Issues in Criminal Justice* 269.

9 See 4.4: Research questions.

2.2.1 Lawyers

There have been relatively few studies on lawyers and their perceptions and handling of DNA evidence. In 2008, Wheate noted a dearth of literature in this area directed at the legal and scientific communities.[10] The research that has been undertaken has focussed primarily on learning about lawyers' perceptions of DNA evidence. It suggests that lawyers have high expectations of DNA evidence, often believing it to be *certain*, yet this necessarily hampers their ability to manage the same misconception held by jurors.

Research conducted by the Environmental and Science Research (ESR) group[11] in New Zealand found that, like investigators and lay people, lawyers believe that DNA evidence is *100% certain*.[12] Findlay and Grix,[13] in their 2003 review of the *Crimes (Forensic Procedures) Act 2000* (NSW), found that lawyers in New South Wales consider DNA to be crucial identification evidence for the prosecution case. The implications of this finding lie in the importance of ascertaining whether this belief influences how they manage and understand the evidence in their day-to-day practice. Findlay and Grix interviewed prosecutors, defence barristers and judicial officers and observed trials to establish how legal professionals perceive DNA evidence in New South Wales.[14] Their research relied on interviews and observational data of lawyers managing DNA evidence in criminal trials. They suggest that legal counsel have a responsibility to manage bias demonstrated by jurors in favour of DNA evidence and this gives them the 'unenviable role of presenting evidence beyond the ordinary purview of the law itself to jurors who have already formed often incorrect ideas about the evidence.'[15] Lawyers are unlikely to be able to do this if they themselves share the same biased views of DNA evidence.

Grace, Midgley, Veth and Ahuriri-Driscoll's research in New Zealand in 2010 considers how lawyers deal with DNA evidence. It too suggests that lawyers have unrealistic expectations of the certainty of DNA results and this has underpinned the creation of research and interview questions that asked lawyers if they felt there were any limitations to DNA evidence[16] and the level of certainty they felt

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[10] Rhonda Wheate, 'Australian Forensic Scientists: A View From the Witness Box' (2008) 40(2) *Australian Journal of Forensic Sciences* 123, 124.

[11] Johanna Veth, Annabel Ahuriri-Driscoll, Victoria Grace and Gerald Midgley, 'Lay and Professional Understandings of Forensic DNA Evidence' as cited in James Wallman, Claude Roux and Chris Lennard (2011) 7(1) *Forensic Science, Medicine and Pathology* 75-138.

[12] Ibid.

[13] Findlay and Grix, above n 8, 270.

[14] Ibid.

[15] Ibid 276.

[16] See 4.4.1 Research question 2A.

the evidence provided for their criminal cases by asking what they understood DNA evidence to mean for their criminal practice.[17]

Data collected and conclusions drawn by these researchers and others in researching juries, forensic scientists and judicial officers also suggest a gap in our understanding of how lawyers practically manage and understand DNA evidence in criminal trials. These studies are discussed briefly below.

2.2.2 Juries

Research that reveals jurors' perceptions of DNA evidence is important because it will help denote lawyers' responsibilities or the nature of the tasks facing lawyers when dealing with DNA evidence in jury trials. Further research into jurors' perceptions of how lawyers handle DNA evidence is important because it reveals whether lawyers are discharging their duties as advocates in presenting cogent, reliable, conceptually available evidence, free from misconceptions, and/or whether they effectively challenge evidence where that is necessary. Jury research on DNA evidence reveals that jurors neither convict nor acquit more often with the presence or absence of DNA evidence.[18] Even if it were influencing jurors, the effect of the so called 'CSI effect'[19] is potentially reduced as knowledge about DNA is increased with more visual presentation of the evidence, for example using a PowerPoint presentation for the basic scientific propositions for DNA evidence testing and analysis.

Goodman-Delahunty and Hewson conducted extensive research on juror understanding of DNA evidence for the Australian Institute of Criminology.[20] Their 2010 study was the first to consider whether a tutorial about DNA evidence actually helps jurors in understanding the evidence and assists in their deliberations.[21] The tutorial used for their study was 18 minutes long and cognitively-sequenced,[22] presenting uncontested information on DNA profiling and the random match probabilities and statistics used in trials.[23] It was delivered as part of a simulated trial and based on

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17 See 4.4.1 Research question 1A.

18 Rachel Diosa-Villa, 'Is there Evidence of a CSI Effect?' in Kevin J Strom and Matthew J Hickman, 'Forensic Science and the Administration of Justice' (Sage, 2015) 21.

19 When there is an unrealistic expectation of what forensic evidence can prove generated by popular crime shows. See Simon A Cole and Rachel Diosa-Villa, 'CSI and Its Effects: Media, Juries and the Burden of Proof' (2007) 41(3) *New England Law Review* 435.

20 Goodman-Delahunty and Hewson, above n 5, 1.

21 Warren Young, 'Possible Changes to Jury Trial Practice' (Paper presented at the Australian Institute of Judicial Administration Criminal Trial Reform Conference, Melbourne, 24 March 2000).

22 Referring to presenting the information in an order that flowed from the collection of the trace evidence through to testing and analysis of the evidence in a laboratory and by a statistician.

23 Goodman-Delahunty and Hewson, above n 5, 1, viii–ix.

real case facts and transcripts from a homicide matter. The DNA sample in question suggested a 'strong link' to the defendant but was adduced in an otherwise weak circumstantial case.

Important for this research, was the key finding that the presence of DNA evidence increased conviction rates and that the tutorial increased juror knowledge of DNA evidence.[24] Using visual aids to assist presentation of DNA evidence also assisted and facilitated learning by members of the jury. Mock jury members taking part in this research were found to lack insight into their own experiences with DNA evidence prior to viewing the PowerPoint presentation.[25] This begs the question whether lawyers can assess and control jury bias toward DNA evidence if jury members themselves are unable to recognise the influence of DNA evidence on their own trial experience. The finding that visual tutorials increased knowledge of DNA evidence by jurors might go some way to answering this question. It demonstrates that communication of the evidence (by lawyers) is important.

Goodman-Delahunty and Hewson's work is further supported by that of Findlay and Grix who found that jury confusion about DNA evidence stems from conceptual difficulties they experience arising from the presentation of the evidence and problems they have in determining how much weight to give to the evidence at trial.[26] Many of the mock jurors surveyed before the trial took place, exhibited strong pre-existing assumptions about how DNA evidence determines guilt or innocence in criminal cases.[27] Post-trial jurors were still confused about DNA evidence, despite the introduction of DNA evidence by lawyers and forensic scientists in the mock trial.[28]

This suggests that lawyers are presenting DNA evidence to jurors who are confused about how much weight to attribute to DNA evidence and what it can prove.[29] At the same time, the proliferation of modern crime television programs[30] and the documented 'CSI effect'[31] appear to embed perceptions among lay people that DNA evidence has a high degree of certainty and reliability. This research accepts that lawyers are presenting evidence to jurors with often very high expectations of DNA evidence and this places an even greater responsibility on lawyers to understand and competently introduce and challenge the evidence in court. One of the core aims of this study was to identify where

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24 Ibid.

25 Ibid ix–xi.

26 Findlay and Grix, above n 8, 275.

27 Ibid.

28 Ibid.

29 Findlay and Grix, above n 8, 276.

30 For example, television shows such as CSI: New York, CSI: Miami, Bones and Criminal Minds.

31 When there is an unrealistic expectation of what forensic evidence can prove as a result of popular crime shows, see Diosa-Villa, above n 18; and Cole and Diosa-Villa, above n 19.

lawyers struggled with the evidence so that they might improve the way they manage DNA evidence in criminal trials and meet that responsibility more competently.

2.2.3 Forensic scientists

It is important to know what studies of forensic scientists reveal in this area because they present evidence to lawyers and the courtroom as expert witnesses and they are in an excellent position to comment on how well lawyers manage their evidence in the courtroom. The overall tenor of the conclusions of research in this area are that forensic scientists generally view lawyers as being ill-equipped to present and/or challenge DNA at trial. This is attributed to significant gaps in their knowledge and understanding of DNA evidence and their failure to engage in useful communication with forensic scientists prior to trial.

Lawyers' perceived inadequate preparation for trials and presentation of DNA evidence is of particular concern to Australian forensic scientists.[32] Additionally, they consider lawyers to have problems communicating discipline-specific terminology and jargon to jurors and the judiciary.[33] According to forensic scientists, lawyers fail to understand basic forensic principles associated with DNA evidence[34] and miscomprehend the role of crime scene examiners at the crime scene, forensic biologists in the laboratory and statisticians who work with probability ratios in the analysis phase.[35]

Flaws in communication and the eliciting of evidence at trial were linked by some forensic scientists in Wheate's study to the adversarial nature of the criminal trial. They found defence lawyers' behaviour to be counterproductive in this regard in that they were 'gleeful, rude, loud, sarcastic and offensive.'[36] Forensic scientists also criticised lawyers for inadequate questioning techniques. Their questions left forensic scientists feeling that inappropriate weight or unintended meaning might be given to their answers. The structure, logic, relevance and sense of questions and the overall examination-in-chief, cross-examination and re-examination of forensic scientists were major issues for the scientists involved.[37] They often found that they were unable to adequately elucidate their evidence due to the nature of the questions put to them, and they lost control of how the evidence was presented so that in their minds what was presented in court was not entirely accurate. While

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[32] Wheate, above n 10.

[33] Ibid 125–128.

[34] Ibid; Simon Walsh, 'Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature' (2005) 155(1) *Forensic Science International* 51.

[35] Wheate, above n 10.

[36] Ibid 131.

[37] Ibid.

many forensic scientists were more positive about judicial officers' ability to understand or willingness to seek clarification of forensic evidence,[38] many judges, nevertheless, were believed to be confused by conflicting expert opinion. These views were also found in earlier research surveying the entire Australian judiciary in 1999.[39]

There is a manifest need for ongoing dialogue between lawyers and experts in criminal cases, if the former are to understand and not to surprise the latter and vice versa. In Wheate's study, Australian and New Zealand lawyers did not have sufficient contact with forensic scientists pre-trial,[40] did not ask appropriate questions in order to elicit the most accurate and relevant information from forensic scientists[41] and did not understand the language of the forensic disciplines.[42] This research focused primarily on the collection of evidence; how forensic scientists deal with legal counsel before and during legal proceedings; and their interactions with judges, juries and other forensic experts when giving expert evidence.[43]

In relation to lawyers' inadequate knowledge and understanding of DNA evidence, Wheate recommends that lawyers attend training to ensure they are updated about developments in DNA evidence and are aware of its limitations. Lawyers' views about their interactions with forensic scientists in criminal cases involving DNA evidence have not been canvassed in Australian research. The present study aims to fill that gap. It also aims to provide recommendations for training providers and legal organisations in making legal education about DNA evidence both relevant and useful for lawyers.

2.2.4 Judges and the judiciary

Research on the judiciary has called for further training for lawyers to assist in the presentation of evidence, including DNA evidence, by expert witnesses.

Freckelton, Reddy and Selby[44] conducted a comprehensive survey of Australian judges and magistrates to gauge their views on the presentation of expert evidence in court. Their 1999 study, although conducted more than fifteen years ago, recommended that lawyers complete training on how to

38 Ibid 134–135.

39 Freckelton, Reddy and Selby, above n 7.

40 Wheate, above n 10, 126.

41 Ibid.

42 Ibid 128–129.

43 Wheate, above n 5.

44 Freckelton, Reddy and Selby, above n 7.

introduce or cross-examine experts.[45] This was based on judges' opinions of how lawyers questioned expert witnesses[46] and dealt with irreconcilable expert testimony.[47] The recommendation for further training for lawyers in this area is a common one. It continues to be made in forensic science literature,[48] reviews into miscarriage of justice cases[49] and reviews of forensic process around the world.[50]

2.2.5 DNA evidence generally

Research conducted into the use of DNA evidence generally, has found that DNA evidence has a marked effect on court outcomes — in particular, convictions — and under-prepared legal counsel may play a role in allowing miscarriages of justice to occur.

Briody conducted research into the effect of DNA evidence in two types of criminal cases — homicide and sexual assault cases.[51] His research focused on the overall effect that DNA evidence had on court outcomes.[52] This makes it relevant for lawyers presenting this evidence in such trials. One hundred and fifty completed cases that had been recommended by police for prosecution in Queensland were examined in Briody's homicide study. Half of these cases were used as a control group, without DNA evidence, and the other half involved DNA evidence in some way.

Two independent variables were found to be significant predictors of homicide cases proceeding to trial: DNA evidence and the accused being male.[53] This result confirmed the hypothesis that a higher proportion of homicide cases would reach court if DNA evidence was presented.[54] DNA evidence was found to be a strong predictor of decisions to prosecute by the Office of the Department of Public Prosecutions (DPP). The study found that the odds of a case reaching trial were more than 14 (14.69) times higher when there was DNA evidence than when there was not.[55]

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45 Ibid 5.

46 Ibid 2.

47 Ibid 4.

48 Wheate, above n 5.

49 Vincent Report, above n 2, 32.

50 NAS Report, above n 4.

51 Briody, 'The Effects of DNA Evidence on Sexual Offence Cases in Court', above n 5; Briody, 'The Effects of DNA Evidence on Homicide Cases in Court', above n 5.

52 Briody, 'The Effects of DNA Evidence on Sexual Offence Cases in Court', above n 5; Briody, 'The Effects of DNA Evidence on Homicide Cases in Court', above n 5.

53 Briody, 'The Effects of DNA Evidence on Homicide Cases in Court', above n 5, 245.

54 The sample size in this study was, however, only 75 cases, so the generalisability of the findings is limited.

55 Briody, 'The Effects of DNA Evidence on Homicide Cases in Court', above n 5, 245.

Briody also found that juries were more likely to convict where the prosecution adduces DNA evidence in homicide cases,[56] and the odds of a conviction in cases with DNA evidence are much higher than without.[57] This finding supports Goodman-Delahunty and Hewson's conclusion[58] that, in particular case configurations, the addition of DNA evidence was found to change the predicted jury outcomes from acquittals to convictions.[59]

Briody's sexual assault research involved 200 closed cases in Queensland — 102 presented DNA evidence and 98 did not and acted as a control group.[60] There were correlations found between DNA evidence in sexual assault matters and the decision to prosecute, the jury's verdict, whether an offender received a prison sentence and slightly longer prison sentences when an offender was found guilty.[61] The significance of this research for the present study is that it shows the existence of DNA evidence may result in erroneous convictions. This means that lawyers have a duty to ensure that this evidence is reliable. Understanding how lawyers deal with DNA evidence in criminal trials is an important step toward improving their use and understanding of this evidence and preventing flawed decision-making.

In the United States, Collins and Jarvis reviewed case files from 283 post-conviction exonerations that occurred between 1989 and 2007 as part of the Innocence Project.[62] Their research examined the degree to which forensic science was found to be responsible for the wrongful convictions.[63] The leading cause in fact, was found to be eyewitness misidentifications, followed by false confessions.[64] Problematic forensic evidence, including DNA evidence was not one of the causes of conviction discussed in this research. However, of significance for the present research is the finding that in three of the 283 reviewed cases, 'bad lawyering and government misconduct' was considered to be the reason behind the unsafe conviction.[65] Preliminary evidence suggests however, that nearly '*all* of the

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56 Ibid 250.

57 Ibid, 237. The author warns of using these results as conclusive evidence due to the small sample size.

58 Goodman-Delahunty and Hewson, above n 5.

59 Briody, 'The Effects of DNA Evidence on Homicide Cases in Court', above n 5.

60 Briody, 'The Effects of DNA Evidence on Sexual Offence Cases in Court', above n 5, 161.

61 Ibid 179.

62 The first Innocence Project was begun by Barry C Scheck and Peter J Neufeld at the Benjamin N Cardozo School of Law, University of New York City in 1992. See <www.innocenceproject.org> for information on over 300 cases of exonerated individuals and the work conducted by this and other innocence projects.

63 John Collins and Jay Jarvis, 'The Wrongful Conviction of Forensic Science' (2009) 1 *Forensic Science Policy & Management: An International Journal* 17.

64 Ibid 25.

65 Ibid.

overturned convictions could have been prevented by more competent and ethical legal counsel on both sides.'[66]

Also in the United States is the work of Garrett, who examined the first 250 cases of wrongfully convicted people who were later exonerated due to DNA testing. His findings suggest that incompetence, abuse of process and error on the part of crime scene examiners, police and lawyers were responsible for a majority of the convictions.[67] These findings suggest that knowledgeable and competent legal counsel may prevent wrongful convictions and miscarriages of justice from occurring in certain criminal cases.

In similar American research by Saks and Koehler,[68] forensic science identification errors and false or misleading testimony from forensic scientists was responsible for errors in 63% and 27% respectively of a sample of wrongful convictions taken from the Innocence Project. Although these findings were based on a smaller sample size than that of Collins and Jarvis's study, it nevertheless signifies the powerful effect of forensic evidence on court outcomes.

Of concern is the scarcity of research into what lawyers understand about the science or presentation of DNA evidence, particularly given the results of the research studies discussed above. Collins and Jarvis' American research demonstrates that lawyers play an influential role in wrongful convictions in that jurisdiction — supporting the argument that competent lawyers with good understanding of the evidence presented might protect people from miscarriage of justice convictions.

If that is also the case in Australia, then cases with DNA evidence are at risk of becoming miscarriages of justice — purely because lawyers may not be dealing competently with the evidence and expert witnesses in court. If jurors are increasingly relying on DNA evidence, then the role lawyers play in questioning expert witnesses and explaining how DNA evidence affects criminal cases becomes even more important. These studies present lawyers with the challenge of managing the expectations of jurors, the judiciary and forensic scientists, all while presenting the strength of DNA evidence accurately. What is missing is research that explores lawyers' experiences of DNA evidence and the difficulties associated with its interpretation and presentation in criminal trials. This research aims to fill that gap.

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66 Ibid.

67 Brandon L. Garrett, *Convicting the Innocent: Where Criminal Prosecutions Go Wrong* (Harvard University Press, 2011)

68 Michael J Saks and Jonathan J Koelher, 'The Coming Paradigm Shift in Forensic Identification Science' (2005) 309 *Science* 892.

2.3 The use of DNA in criminal trials

A study that explores the use of DNA evidence by lawyers in criminal trials, requires an investigation into the relevant case law in the jurisdictions that are under examination. Case law in other jurisdictions provides further evidence of some of the current issues facing lawyers in dealing with DNA evidence in Australian courts. Courts are increasingly and routinely accepting DNA evidence.[69] DNA evidence, analysed by qualified forensic biologists in accredited laboratories, is seen by the courts as a reliable form of expert evidence under s 79 of the *Evidence Act 2011* (ACT), *Evidence Act 2008* (Victoria) and *Evidence Act 2005* (Cth). There are ongoing issues, however, with the presentation or interpretation of DNA evidence in court — as evidenced by the discussions of the case law below and the research outlined above.[70]

Courts are increasingly routinely accepting DNA evidence.[71] Experts are increasingly demonstrating the validity of their investigative techniques and because laboratories used for DNA testing are accredited, DNA evidence is generally accepted by the court as a reliable form of evidence (although there are calls for improvements in relation to forensic disciplines other than DNA evidence).[72] There are still issues, however, with the presentation or interpretation of DNA evidence in court. Yet case law and research present only a small sample of the problems still being identified by practitioners, scientists and academics as to the use of DNA. The present study aims to investigate several of the concerns identified in the research and case law and those not yet considered by Australian research.

Haesler J, when Deputy Senior Public Defender in New South Wales, regularly published information on the use of DNA in criminal trials on the New South Wales Public Defender's website,[73] in journal

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69 Henry Roberts, 'Interpretation of DNA Evidence in Courts of Law: A Survey of the Issues' (1998) 30 *Australian Journal of Forensic Sciences* 29.

70 Goodman-Delahunty and Hewson, above n 5; Wheate, above n 5; Briody, 'The Effects of DNA Evidence on Sexual Offence Cases in Court', above n 5; Briody, 'The Effects of DNA Evidence on Homicide Cases in Court', above n 5; all of the studies that suggest issues with presentation or interpretation of DNA evidence by any of the legal institutions.

71 Roberts, above n 69.

72 See Gary Edmond, 'The admissibility of forensic science and medicine evidence under the Uniform Evidence Law' (2014) 38 *Criminal Law Journal* 136; Gary Edmond, 'Impartiality, Efficiency or Reliability? A Critical Response to Expert Evidence Law and Procedure in Australia' (2010) 42(2) *Australian Journal of Forensic Sciences* 83; Also see Gary Edmond, 'Actual Innocents? Legal Limitations and their Implications for Forensic Science and Medicine' (2011) 43(2-3) *Australian Journal of Forensic Sciences* 177.

73 See Andrew Haesler, *DNA for Defence Lawyers* (25 May 2011) NSW Public Defender's Office <http://www.publicdefenders.nsw.gov.au/Documents/dnafordefencelawyers.pdf>; Andrew Haesler, *DNA in the Local Court* (February 2009) NSW Public Defender's Office <http://www.publicdefenders.nsw.gov.au/Pages/public_defenders_research/Papers%20by%20Public%20Defenders/public_defenders_dna_local_court.aspx>; and Andrew Haesler, *DNA in the Local Court – the CSI Effect* (September 2010) NSW Public Defender's Office,

articles[74] and at academic conferences.[75] He argued that defence counsel often failed to scrutinise areas of potential weakness that might undermine the validity of DNA evidence, including, partial matches, weak readings with stutter or drop out, mixtures, contamination, bias in the lab, inadvertent or second transfer and problems with the statistics.[76] Haesler's publications on the NSW Public Defender's website were also reportedly used by lawyers, including prosecutors, from jurisdictions outside NSW.[77]

The acceptability of DNA technology depends on the coherence of those testifying and their effectiveness as communicators.[78] Although it is extremely important for experts to communicate their evidence effectively, it is equally important for lawyers who question experts and summarise their evidence to the court, to explain clearly the legal implications of the results to jurors. Trial lawyers also have a responsibility to 'test' the evidence that is introduced by expert witnesses.[79]

Edwards suggests a detailed checklist of issues for lawyers to consider when they work with DNA evidence.[80] This is intended to alert lawyers to the fallibility of DNA results and the frequency of contamination and error in the interpretation and presentation of statistics. Edwards aims to prevent blind acceptance of laboratory results and reports and encourages careful scrutiny of DNA results.[81] The check list provides important information about DNA contamination and laboratory error including, but not limited to the following:

- that it happens a lot;
- that it happens in Australia;
- that it can and does happen at every stage of the evidentiary process;
- that sometimes it cannot be detected; and

<http://www.publicdefenders.nsw.gov.au/Pages/public_defenders_research/Papers%20by%20Public%20Defenders/public_defenders_dna_local_court_csi_effect.aspx>.

74 Andrew Haesler, 'DNA in Court' (2008) 8(1) *Judicial Review* 121.

75 See for example, Andrew Haesler, 'Issues in Gathering, Interpreting and Delivering DNA Evidence' (Paper presented at Expert Evidence Conference, Canberra, February 2011) <http://njca.com.au/wp-content/uploads/2013/07/Judge-Andrew-Haesler-SC-Issues-in-Gathering-Interpreting-and-Delivering-DNA-Evidence-paper.pdf>.

76 Haesler, above n 74.

77 Interview with L2 (21 June 2011).

78 Ian Freckelton, 'DNA Profiling: Forensic Science Under the Microscope' (1990) 14(1) *Criminal Law Journal* 23.

79 Ibid.

80 Kirsten Edwards, 'Ten Things Lawyers Should Know About DNA Evidence' (2005) 29 *Criminal Law Journal* 71.

81 Ibid.

- that it is not too hard for a lawyer to understand the risks of human error.[82]

The presentation of statistical probabilities has also proved to be problematic in some cases. In Australia, trial judges and lawyers are constrained in their ability to define the term 'beyond reasonable doubt'[83] when addressing juries. However, what they say about DNA evidence may very well influence the way jurors approach the task of assessing it either alone or in conjunction with other evidence,[84] and ultimately decide the guilt or innocence of the accused. In the early years of DNA evidence, it was ruled in several cases that such evidence was inadmissible on the basis that its probative value was outweighed by its tendency to produce a misleading and confusing impression for the jury.[85] The more modern view, however, is that DNA evidence is probative, in most cases reliable, and is a common item of evidence in criminal cases worldwide.

DNA evidence may be presented as a match probability — for example, 'the chance that a particular individual related to the defendant will match the DNA profile from the crime sample is 1 in 400,000.' It may also be presented as a likelihood ratio — the probability of a match given the defendant is guilty against the probability of a match given the defendant is innocent.[86] Essentially two questions may be asked of DNA evidence —

1. What is the probability that the defendant's DNA profile will match the profile from the crime sample, given that he or she is innocent?

2. What is the probability that the defendant is innocent, given that his or her DNA profile matches the profile from the crime sample?

The first question focuses on the assumption that the accused is innocent and then asks what the chances are of a match. The second question is of relevance to the courts because it focuses on the likelihood of innocence or guilt if in fact the sample is deemed to 'match' the accused's profile. The 'prosecutor's fallacy' arises when the answer to the first question is given as the answer to the second.[87] Two examples of the prosecutor's fallacy are contained in the following statements: that

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82 Ibid.

83 See *Thomas v The Queen* (1960) 102 CLR 584; *Green v The Queen* (1971) 126 CLR 28.

84 Jeremy Gans and Gregor Urbas, 'DNA Identification in the Criminal Justice System' (2002) 226 *Australian Institute of Criminology: Trends and Issues in Crime and Criminal Justice* 1, 4.

85 See *R v Tran* (1980) 50 A Crim R 233; *R v Lucas* [1992] 2 VR 109; and *R v Percerep* [1993] 2 VR 109.

86 David J Balding and Peter Donnell, 'The Prosecutors Fallacy and DNA Evidence' (1994) *Criminal Law Review* 711. The term 'prosecutor's fallacy' was created by William C. Thompson and Edward L. Shumann, 'Interpretation of Statistical Evidence in Criminal Trials: The Prosecutor's Fallacy and the Defense Attorney's Fallacy' (1987) 2 (3) *Law and Human Behavior* 167.

87 Ibid 716.

'the chance that the DNA in the crime scene sample came from someone other than the defendant is 1 in 300,000' and 'the probability that the defendant is innocent given the DNA evidence is 1 in 300,000.'[88] The correct statement is that the 'chance of a match to a random member of the population (i.e. not the accused) is 1 in 300,000.'

Another example of the prosecutor's fallacy was given in *R v Doheny and Adams*:

It is easy if one eschews rigorous analysis, to draw the following conclusion:

(i) Only one person in a million will have a DNA profile which matches that of the crime stain.

(ii) The defendant has a DNA profile which matches the crime stain.

(iii) Ergo there is a million to one probability that the defendant left the crime stain and is guilty of the crime.[89]

The existence of the fallacy is now well recognised.[90] There is also the defence counsel's fallacy. This suggests that 'associative statistical evidence is irrelevant regardless of the *matching*.'[91] This fallacy fails to take into account the circumstance that the majority of the pool of people with relevant, or potentially relevant, DNA matches are not suspects in the case being tried. So, although it is *possible* that there are others who might have the same DNA profile as that left at a scene, the real impact of the likelihood ratio is for persons who have been shown, in the majority of cases, to have had the opportunity to commit the crime, or where there is other evidence to suggest their involvement.[92] Neither will apply in DNA evidence-only trials. Nevertheless, it is important for counsel to understand both the prosecutors and defence counsel's fallacy when they present DNA evidence in court.

The use of DNA evidence by lawyers, forensic scientists and the jury has been discussed in several recent cases in the ACT and the High Court of Australia. These are the cases of *Aytugrul v The Queen*,[93]

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88 Ibid.

89 *R v Doheny and Adams* (1997) 1 Cr App R 369, 372–3.

90 See *R v Karger* (2002) 83 SASR 135, 140; *R v Keir* [2002] NSWCCA 30; *R v GK* [2001] NSWCCA 413; and *R v Galli* [2001] NSWCCA 504.

91 Michael Redmayne, 'Doubt and Burdens: DNA Evidence, Probability and the Courts' (1995) *Criminal Law Review* 464, 474–6.

92 James Wood, 'Forensic Sciences From the Judicial Perspective' (2003) 35 *Australian Journal of Forensic Sciences* 115, 120.

93 *Aytugrul v The Queen* [2012] HCA 15.

R v Whyms,[94] *R v Meyboom*,[95] *R v Hillier*,[96] and *Forbes v R.*[97] The Victorian case of *R v Jama*[98] provides further insight into the court's approach to DNA evidence, but is discussed in the reports of miscarriages of justice section below.[99] These cases have significant implications for the presentation of DNA evidence at trial. Some consistent themes emerge from these cases, three of which will be explored here. The first is the intelligibility and expression of DNA evidence generally, as discussed in *Aytugrul* and *Whyms*. *Meyboom* and *Forbes* highlight a second area of concern — the presentation of probability ratios and statistics specifically. Finally, *Forbes* and *Hillier* give insight into how DNA evidence is used to prove cases 'beyond a reasonable doubt'. Several of these cases highlight more than one of these themes. Each case will be briefly summarised with important facts and items of evidence explained before the themes present in each of the judgments are explored.

2.3.1 Expression of DNA evidence

Although each of the cases discussed below deliberate to some extent upon the difficulties associated with the expression of DNA evidence in the trial context, this matter was the central issue in the appeals in *Aytugrul* and *Whyms.*

Aytugrul

Yusuf Aytugrul[100] was charged and convicted of murder in 2012 in the Supreme Court of New South Wales. He appealed to the Court of Criminal Appeal arguing that the presentation of the DNA evidence as an exclusion percentage carried a residual risk of unfairness and that that presentation should have been excluded under s 137 of the *Evidence Act 1995* (NSW) as its probative value was outweighed by the danger of unfair prejudice. Alternatively, he argued that it should have been excluded under s 135 as its probative value was outweighed by the danger that it might have been misleading or confusing.[101] The Court of Criminal Appeal rejected the appeal. The appellant then sought special leave to appeal to the High Court. The majority of the Court, French CJ, Hayne, Crennan and Bell JJ, also dismissed the appeal.

The DNA evidence in this case was taken from a single hair found under the deceased's thumbnail, which was subjected to mitochondrial DNA testing. Traditional DNA testing was not possible. Because

94 *R v Whyms* [2012] ACTSC 7.
95 *R v Meyboom* [2011] ACTSC 13.
96 *R v Hillier* [2010] ACTSC 33.
97 *Forbes v R* (2009) 167 ACTR 1.
98 *R v Jama* [2008] VCC 0886.
99 See 2.4.1.
100 *Aytugrul v The Queen* [2012] HCA 15.
101 *Aytugrul v The Queen* (2010) 205 A Crim R 157.

this form of DNA testing is not as individualised as traditional DNA analysis (in mtDNA the DNA is all inherited from a person's mother rather than mother and father) the statistical approaches used for nuclear DNA testing could not be used. The standard North American database was used to compare the hair sample with mtDNA profiles on the database.

Three experts gave evidence and agreed that the appellant could not be excluded as the donor of the hair found under the deceased's thumbnail. However, they differed as to the weight that could be given to that conclusion.[102] Two of the experts gave a population frequency ratio for the mtDNA in the hair found on the deceased of 1 in 1000 people from the general population.[103] The third expert gave a frequency ratio of 1 in 1600 people, making it slightly more unlikely someone other than the defendant would have the same mtDNA result. This expert also gave evidence that 99.9% of people would not be expected to have the DNA profile matching that of the hair. It was this latter expression, the so-called 'exclusion percentage', to which Aytugrul took objection. He claimed that the impact upon the jury of subliminally rounding 99.9% up to 100% was unfairly prejudicial.

The essence of the appellant's argument was that the expression of DNA evidence as an 'exclusion percentage' was more persuasive to jurors than its expression as a frequency ratio and that the jury were more likely to convict based on that percentage. Aytugrul's argument is reflected in the dissenting judgment of McClellan CJ at CL of the Court of Criminal Appeal who raised the issue of the intelligibility of DNA evidence and juror comprehension of statistical evidence.[104] His Honour referred to published articles[105] on the persuasive power to lay people of language and probabilistic statements.[106] He found that 'certain forms of expressing [DNA] statistics carry greater persuasive potential than others.'[107]

The appellant sought to have the proposition that DNA evidence expressed as an 'exclusion ratio' should be excluded under s 137 elevated to a general rule, relying on those articles. The majority High Court judges declined to accept that proposition, finding that, '[n]o sufficient foundation was laid, at

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[102] *Aytugrul v The Queen* [2012] HCA 15, [7].

[103] Ibid [15].

[104] *Aytugrul v The Queen* (2010) 205 A Crim R 157 [102].

[105] See discussion at 6.2.1 and the research of Kristy Martire et al, 'On the Interpretation of Likelihood Ratios in Forensic Science Evidence: Presentation Formats and the Weak Evidence Effect' (2014) 240 *Forensic Science International* 61; Kristy Martire et al, 'The Expression and Interpretation of Uncertain Forensic Science Evidence: Verbal Equivalence, Evidence Strength and the Weak Evidence Effect' (2013) 37(3) *Law and Human Behaviour* 197; Kristy A Martire, Richard I Kemp and Ben R Newell, 'The Psychology of Interpreting Expert Evaluative Opinions' (2013) 45(3) *Australian Journal of Forensic Sciences* 305.

[106] *Aytugrul v The Queen* (2010) 205 A Crim R 157, 174 [89].

[107] Ibid 176 [97].

trial or on appeal (whether to the Court of Criminal Appeal or this court) for the creation or application of a general rule of the kind described.'[108]

With respect to the articles relied upon by the appellant, the majority judges held that it was 'neither necessary, nor appropriate'[109] to consider whether the articles and their research findings supported this proposition. They did note, however, that no proof had been attempted of the opinions they expressed and that without such proof a court could not adopt a general rule of the kind proposed by the appellant 'based only on [its] own researches suggesting the existence of a body of skilled opinion that would support it.'[110] Similarly, their Honours declined to resolve the absence of proof problem by taking 'judicial notice' of this material as establishing such a proposition because it did not meet the requirements of s 144 of the *Evidence Act 1995* (NSW). In this regard, they held that 'knowledge of the proposition in question could not be said to be "not reasonably open to question" and "common knowledge" or "capable of verification by reference to a document the authority of which cannot reasonably be questioned"'.[111] Further, the majority stated (noting that the field in question is psychology not law) that it had not been demonstrated that the methods used in the studies relied upon, and their results had attained, such a degree of general acceptance amongst experts in relevant disciplines as to permit a court to take judicial notice of some general proposition about human understanding or behaviour said to be revealed by them.[112]

With regard to the specific evidence in question, the majority judges found that there was no reason to reject it under s 137 or s 135. They held that because the exclusion percentage and frequency ratio were 'no more than different ways of expressing the one statistical statement,' the probative value of the percentage had to be the same as that of the frequency ratio.[113] With regard to the residual risk of unfair prejudice deriving from the jury subliminally rounding up the exclusion percentage to 100, they held that it had been all but eliminated by the explanation of the evidence provided to the jury.

Aytugrul supports the proposition that evidence of exclusionary percentages is prima facie admissible, regardless of the research that demonstrates that jurors' understanding is often compromised when exclusionary language is used by experts to present DNA analysis in criminal trials. Lawyers are left

[108] *Aytugrul v The Queen* (2012) HCA 15, [20].
[109] Ibid [17].
[110] Ibid [22].
[111] Ibid [21].
[112] Ibid [20].
[113] Ibid [28].

with a number of options in presenting mtDNA evidence (and arguably all DNA evidence) — by using frequency ratios or exclusionary percentages, or both.

Whyms

Whyms also explored the expression of DNA evidence, though in this case the focus was specifically on the intelligibility of probability ratios. *Whyms* provides an example of how the expression of DNA evidence through probability ratios may be confusing for lawyers.[114]

David Whyms[115] was charged with trespass and burglary in 2008 in Canberra. The trial was conducted as a judge-alone trial before Refshauge J in 2012.[116] Two items of DNA evidence were adduced — a sample taken from the crime scene and a sample from Whyms. Other evidence adduced by the prosecution included eye witness evidence of a car at the crime scene that was identical to the car in which the police found Mr Whyms' personal possessions and items that had been stolen from the crime scene. Refshauge J noted that while there were circumstances pointing to Mr Whyms' possible involvement in the offences, the critical evidence was the DNA evidence.

There was no challenge to the forensic procedure adopted by forensic investigators and police for the DNA evidence. Refshauge J also accepted the forensic expert's testimony that it was '23 billion times more likely that the DNA analysed from the blood on the broken window came from Whyms than from an unrelated and unknown member of the general population.'[117] In making this statement Refshauge himself commits the prosecutor's fallacy as DNA evidence cannot support that conclusion. It could only support a conclusion that it was 23 billion times more likely <u>if</u> the DNA came from Whyms than an unrelated person. Whether the fallacy was committed by his Honour in interpreting the forensic scientist's report or by the forensic scientist in their initial reporting, lawyers need to be alert to the fallacy: in avoiding making it themselves and recognising when others incorrectly state the effect of DNA evidence in this way. Refshauge then held, following cases such as *Forbes*, that the DNA evidence would ordinarily be sufficient to convict Mr Whyms.[118] However, the evidence then became problematic because it went further. In explaining that the blood found on the window was 23 billion times more likely to come from Whyms, the expert witness testified that such a probability was consistent with the finding of an adventitious match in a population of 18 000.[119] Furthermore, the

[114] The difficulties that lawyers have with probability ratios are discussed further below at 6.2.1.

[115] *R v Whyms* [2012] ACTSC 7.

[116] With authority from s 68C of the *Supreme Court Act 1933* (ACT).

[117] *R v Whyms* [2012] ACTSC 7 (17 January 2012) [59].

[118] Ibid [98].

[119] Ibid [99].

expert witness said that it was not unexpected 'that there would be a match to Mr Whyms' DNA profile in the population of the ACT and Queanbeyan'.[120] At this point the ability of the evidence to establish guilt to the requisite standard unraveled. As a result, his Honour retained a reasonable doubt about Mr Whyms' guilt and so returned a verdict of not guilty. In doing so his Honour stated,

> The clear evidence was that the DNA, notwithstanding the likelihood ratio, was such that in the ACT and Queanbeyan population it was not unexpected, a real possibility that there would be a person whose DNA profile would match the DNA profile from the blood at and near the window of the premises and who is not Mr Whyms. The evidence was not further explained or circumscribed in any way. As a result, I could not exclude that another person left the blood found at and near the laundry window of the premises.[121]

In the course of discussing the statistical expression of the DNA evidence, Refshauge J described it as becoming

> problematic and, I have to say, for me, quite murky. I am aware that in a recent study, about 10% of judicial respondents reported statistics as being a most difficult area of expert evidence[122]… I suspect that I fall within that 10% category.[123]

His Honour was critical of the lack of explanation that was provided to him even though there was, as he said, ample opportunity for this to be done. He held,

> I find it difficult to rationalise the acceptance of the probability of 1 in 23 billion with the fact that an adventitious match in the ACT and Queanbeyan area is not unexpected. That, however, was the expert evidence.
>
> It may be that it could have been further explained. It may have referred to relatedness. It may have referred not to "unexpected" in the ordinary sense but simply that a possibility, even a remote possibility, denies the certainty of non-existence. These were, however, not explained and there was plenty of opportunity for such explanation.
>
> I find this result unsatisfactory for it does appear to me that there was much more explanation that I could have, perhaps should have, been offered. The fact is that, of course, I have to rely on and accept the evidence as presented to the court.

[120] Ibid [100].
[121] Ibid [106].
[122] Freckelton, Reddy and Selby, above n 7, 66.
[123] *R v Whyms* [2012] ACTSC 7 (17 January 2012) [70].

This case reveals how important a consideration the expression of DNA evidence and the intelligibility of that expression is for lawyers when adducing or challenging DNA evidence. When judges admit to being confused by the expression of DNA evidence, as Refshauge J did in *Whyms*, the duty of counsel to understand and explain accurately what the evidence means is made manifest. This case also reveals the importance of unpacking probability ratios to establish exactly what their import is, what level of adventitious matches they are consistent with and, therefore, what they prove.

Lawyers have an unenviable task in ensuring the comprehensibility of DNA statistics in all their various forms of expression. Having a number of acceptable modes of expression of DNA evidence may present additional difficulty for lawyers trying to find an intelligible way to present DNA evidence to a jury and/or a judge in criminal trials. It is critical then to find out whether lawyers have difficulty understanding and/or dealing with DNA evidence presented as frequency ratios or exclusionary percentages or both. Accordingly, the research presented in this thesis explored these questions with lawyers in the ACT and Victoria to determine whether they struggle with the expression of DNA evidence in court. Lawyers were asked about their understanding of the various expressions of the strength of DNA evidence. Further, questions on *any* difficulties associated with DNA evidence were asked in an attempt to elicit information on its expression.

2.3.2 Probability ratios and statistics

The *expression* of probability ratios and statistics has been discussed in relation to *Aytugrul* and *Whyms* above. Probability ratios and statistics are considered here as constituting a theme in their own right because two judgments have specifically considered the wisdom of admitting probability ratios as evidence. The first case is that of *Meyboom*, which concerned samples with mixed DNA profiles, and the second is *Forbes*, where the court was invited to consider whether evidence of probability based on statistical considerations is admissible in the absence of other evidence.

Meyboom

Paul Meyboom[124] was charged with a number of sexual offences in relation to two separate complainants and two separate incidents that took place in Canberra in 2005 and 2006. The case was heard by Higgins CJ in a judge alone trial in the ACT Supreme Court.

Because of the lapse of time between the attacks and the lack of overwhelmingly similarity in their features, Higgins CJ did not allow evidence of one incident to be admissible in consideration of charges for the second incident. Meyboom was charged with two counts of unlawful assault with intent to

[124] *R v Meyboom* [2011] ACTSC 13.

engage in sexual intercourse under s 53(1) under the *Crimes Act 1900* (ACT), three counts of sexual intercourse without consent under s 54(1) of the same *Act*, and two counts of theft under s 308 of the *Criminal Code 2002* (ACT).

The most significant and problematic evidence in this case was the DNA analysis.[125] Higgins CJ noted that,

> In neither case, was there a direct deposit of any biological material by the perpetrator upon either victim so as to yield a complete biological sample as complete as the reference sample from the respective [victims].[126]

All the DNA evidence was found to contain mixed profiles, meaning that there was more than one contributor to the biological material tested for DNA analysis. The mixed DNA profiles were separated into major and minor components. The major components were identical to the DNA profiles obtained from the victims. Three expert reports purported to include the accused in the minor components of the DNA profile obtained in respect of the first incident. All reports calculated in respect of both incidents contained likelihood ratios calculated using the ACT general population database. The first report calculated the likelihood ratio for the accused being a contributor on the assumption that were only two contributors to the minor component, and concluded it was 11 million times more likely that the accused was one of those contributors than a random individual.[127] This is another example of the courts or specifically case law reporting a fallacious conclusion from the DNA evidence. The preceding table documenting the results of the testing presents the correct interpretation of this probability ratio.[128] It did not address the possibility that there might be more than two contributors to the minor components. Lawyers, particularly defence lawyers, must be alert to and object to any evidence that perpetuates the prosecutor's fallacy when they see it presented in court or in the unreported and reported judgments of courts. Lawyers must learn enough about the fallacy to object if and when they need to in order to ensure fair trials for defendants.

The second report found another mixed profile from a minimum of two individuals. It identified the victim's profile as the major contributor. Meyboom was not excluded as a contributor to the minor components. The likelihood ratio for the mixed profile to have come from the victim and Meyboom

[125] Ibid [54].

[126] Ibid [61].

[127] Ibid [66].

[128] Ibid [65] stating 'The evidence is approximately 11 million times more likely if the mixed DNA profile originated from [JT], Craig MEYBOOM and another unknown individual than if it originated from [JT] and two unknown and unrelated individuals randomly selected from the general ACT population.'

was calculated as 127 times more likely than if it can come from the victim and a random member of the ACT population.

The third report concerned another mixed profile with a minimum of two contributors, with neither the victim nor Meyboom able to be excluded as contributors. The likelihood ratio was calculated to be 290 million times more likely if the mixed DNA profile had originated from the victim and Meyboom than if it had originated from the victim and an unknown and unrelated individual randomly selected from the ACT population. Higgins CJ held that this probability did not take into the account the possibility that *more than* two people contributed to the mixed profile because the ratios that were presented to the court were formulated based on an assumption of two contributors only.

In relation to the second incident only two samples tested positive for inclusion of the accused. The first gave a mixed DNA profile from a minimum of three individuals. The major components were identified as identical to the victim's profile, and Meyboom could not be excluded as a contributor to the minor components. The probability ratios presented indicated that it was 600 million times more likely that the mixed DNA profiles were that of the victim, Meyboom and another unknown individual than if it had come from the victim and two unknown individuals randomly selected from the ACT population.

The second sample was again found to contain a mixed profile with a minimum of two contributors. The major contributor was identical to the DNA profile of the victim and Meyboom could not be excluded as a contributor to the minor components. This evidence was rated as 1,900 million times more likely if the mixed profile originated from the victim and Meyboom, than the victim and an unrelated individual, randomly selected from the ACT population.

For all samples, the non-exclusion of the accused was predicated on the assumption that all peaks consistent with his reference profile were contributed by him and no one else.[129]

A third sample taken from the second victim was contaminated with DNA from a staff member and a statistical evaluation was not conducted.

The Australian Federal Police forensic expert explained the process of testing and analysing mixed profiles and the procedures involved in comparing samples with low levels of material. It was stressed that if values are marginal, there cannot be certainty of identification, even as to the number of individuals contributing.[130]

[129] Ibid [77].

[130] Ibid [76].

Higgins CJ noted that it was surprising that no portion of the tape used to lift samples was kept to ensure the integrity of the extraction of DNA from it.[131] Thus the possibility of an independent audit of the process was lost.[132]

Concessions as to the possibility of a third individual contributing to most of the samples, coupled with the absence of some alleles that should have been present if the accused was a contributor, were found to mean that the expert's opinion could go no further than saying that the accused *could* be a contributor but it was reasonably possible that he was not.[133] It was:

> not possible, if the standard of evidence is proof beyond reasonable doubt, to exclude a reasonable hypothesis simply because that hypothesis is not established as a fact ... Where a third contributor can be identified then the extent of the contribution of that contributor, including a replication of alleles otherwise attributable to the accused, must be accounted for.[134]

Meyboom could not be excluded as a minor contributor to the portion of DNA analysed. The presence of a mixed profile in the sample meant that the court could not rule, with any degree of probability that Meyboom was responsible for committing the offence with which he was charged. This supported the court's view that mixed profiles are problematic because it is impossible to exclude or include any potential contributor with certainty if there are more than two people's DNA present. Although the results were not invalidated, they could then be exposed to doubt. As Higgins CJ stated,

> To summarise, for mixed DNA where small amounts are present, it is impossible to, with certainty, exclude or include any particular person as a contributor. Nor was there any test to determine the time at which any DNA found was contributed or in what order.[135]

His Honour then stated that this rendered the evidence of the expert who calculated the likelihood ratios in the reports by reference to the ACT population database, of no probative value in this case.[136]

Meyboom demonstrates that although probability ratios attached to an identified DNA profile are generally of apparent high probative value,[137] where the number of contributors is uncertain, they may be of little or no value at all. In this case, the nature of the mixed profiles led to a finding that although the DNA evidence did not exclude the accused, doubt remained and the criminal standard

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131 Ibid [78].
132 Ibid (Higgins CJ).
133 Ibid [97].
134 Ibid [98].
135 Ibid [104].
136 Ibid [105].
137 Ibid [156].

of proof could not be met. There has been criticism of this judgment by Robertson, Vignaux and Buckleton who felt that the courtroom was not the place for individual judges, assisted by counsel who may not be equipped to explain these matters fully, to discuss how databases should be structured, how uncertainty in the number of contributors should be dealt with and how probabilistic evidence should be treated.[138]

Forbes

Benjamin Forbes[139] was found guilty of engaging in sexual intercourse without consent with a 17-year-old complainant in March 2005 in Canberra. He also pleaded guilty to a separate sexual offence at the same trial. Forbes appealed his conviction in relation to the March 2005 incident to the Court of Appeal in the ACT on the basis that the verdict was unjust or unsafe having regard to several factors.

The first was the nature of the DNA evidence, as the only evidence that identified him. The verdict was, on the appellant's arguments, wholly reliant upon statistical analysis that could not remove all reasonable doubt.

The second factor was that the exculpatory material introduced at trial should have been sufficient to raise a reasonable doubt, provided the DNA evidence had been properly understood. The first of these arguments is considered here in relation to the theme of the presentation of probability ratios and statistics and the second is considered below when discussing the theme relating to the standard of proof that emerged from cases. The appellant's final argument was that the DNA evidence and exculpatory material were such that in combination there was no possibility of removing a reasonable doubt for the jury. These matters were considered in the Court of Appeal by Higgins CJ, Penfold and Besanko JJ in 2009.[140]

The samples taken in this case revealed a mixed partial profile from a minimum of three people, and provided strong evidence that the donor of the DNA reference sample (taken from the appellant) also contributed to another partial mixed profile.[141] Another DNA sample revealed a partial mixed profile, but when considered in isolation of the other information, provided an 'extremely strong link'[142] to Forbes' profile. A semen sample was detected on the victim and the DNA analysis provided 'extremely

[138] Bernard Robertson, Tony Vignaux and John Buckleton, 'Case and Comment: *R v Meyboom* (2011) 28 A Crim R 551' 2013 (37) *Criminal Law Journal* 137, 143.

[139] *Forbes v The Queen* (2009) 167 ACTR 1.

[140] Ibid [3].

[141] Ibid [15].

[142] Ibid.

strong' evidence to support the contention that the donor of the reference sample taken from the appellant was the source of the DNA profile found in the semen. The forensic biologists testified that the likelihood ratio for an 'extremely strong' correlation was greater than 1 million to one.[143]

The defence argued that Forbes had an alibi and that the limitations of DNA evidence and the victim's failure to identify the appellant on a photo board raised a reasonable doubt about Forbes' guilt.[144]

A forensic expert explained to the court how DNA samples are analysed and why statistical calculations are used to describe the probability of a random person in the population having the same DNA profile as the tested sample. Because DNA databases contain 'samples' of populations (rather than every person on the planet), forensic DNA specialists cannot give evidence that a DNA profile is an 'exact match' to a person — they can only use statistical probabilities to demonstrate the strength of the connection between samples.

During the appeal hearing, the defence did not challenge the DNA testing that was conducted in the case, nor were there allegations of contamination or inadequate explanation of the evidence to the jury. Forbes' first submission in the appeal was that where the only evidence incriminating an accused is DNA evidence and there is no other reliable supporting evidence such as identification evidence or evidence of motive or propensity, then an accused must be acquitted.[145] This argument was based on the inability of forensic biologists to say that a crime scene DNA sample *is* an accused's DNA and on that basis the probability ratio means there can never be 100% certainty in DNA evidence.

In *Forbes*, their Honours found that evidence of a likelihood ratio produced by statistical calculations was clearly admissible and in many cases, may be significantly probative in a case with very little other evidence.[146] There may be issues with admissibility and weight of DNA evidence,[147] however this does not prevent the evidence from being highly probative and admissible in an appropriate case.[148]

Meyboom provides a good example of when the courts might be unwilling to accept the reliability of probability or statistical DNA evidence. Mixed profiles are certainly less straightforward than single profile DNA results, and lawyers should adopt a cautious approach to using mixed profile results in criminal cases. Whether lawyers understand mixed profiles, and how they manage mixed profiles is

[143] Ibid.
[144] Ibid [18].
[145] Ibid [35].
[146] Ibid [40] supported by *R v GK* (2001) NSWLR 317, 330–331 (Mason P), 341 (Sully J).
[147] As in *R v Pantoja* (1996) 120 A Crim R 543.
[148] *Forbes v The Queen* (2009) 167 ACTR 1, [40].

unknown. The *Meyboom* case therefore provides further justification for improved knowledge and understanding of how lawyers deal with DNA evidence and concomitantly how they should introduce, defend and challenge this type of evidence. There is a lacuna in our knowledge of lawyers' use of non-standard DNA evidence. In contrast, *Forbes* demonstrates that even in the absence of other evidence, or very little corroborating evidence, probability ratios and statistical DNA evidence can be considered reliable and probative depending on the facts of the case.[149] Lawyers must be able to understand then how probability ratios might support or undermine their hypothesis in any given case. Because of the limited research in this area, lawyers' opinions and management of probability ratios and statistical DNA evidence in criminal trials is unknown. This study attempts to address this gap.

2.3.3 Standard of proof: beyond reasonable doubt

The third theme that can be identified in the case law is discussion of whether DNA evidence alone can establish guilt beyond a reasonable doubt. Inevitably, this occurs most prominently in cases where the only evidence implicating an accused is DNA evidence. The two cases considered here where the capacity of DNA evidence to establish guilt 'beyond reasonable doubt' was of central concern are *Forbes* and *Hillier*.

Forbes

The case of *Forbes* was introduced above. Regarding the limitations of DNA evidence, the Court of Appeal in *Forbes* was asked to consider whether DNA evidence, because of its probabilistic nature, is ever able to provide the certainty needed to establish guilt beyond reasonable doubt in cases where the DNA evidence is the only evidence supporting an inference of guilt.

The Court of Appeal in *Forbes* dismissed the submission that 'where the only evidence incriminating an accused is DNA evidence and there is no supporting evidence such as identification evidence or evidence of motive or propensity, then an accused must be acquitted.'[150] The Court held that DNA evidence alone can be adequate to sustain a verdict in a criminal trial.[151] Their Honours gave a number of reasons for dismissing the application — one of which was particularly relevant to DNA evidence and the standard of proof. The appellant's proposition required the court to revisit the time-honoured

[149] For a discussion of the case, see Jeremy Gans, 'A Tale of Two High Court Forensic Cases' (2011) 33 *Sydney Law Review* 515.

[150] *Forbes v The Queen* (2009) 167 ACTR 1, [35].

[151] Further discussion of DNA-only cases may be found in *R v Pantoja* (1996) 88 A Crim R 554; and *R v Green*, unreported, 26/3/1991. In these two NSW cases, it was demonstrated that although there is no absolute bar to a conviction solely based on DNA evidence, the best approach is that a conviction should be supported by DNA evidence and at least one other item of evidence consistent with the guilt of the accused.

issue of defining the term 'beyond reasonable doubt' and the courts have warned against judges doing this.[152] In addition, the courts have established that the term 'beyond reasonable doubt' does not reflect a calculation of percentage probability.[153] Fingerprint evidence is routinely admitted without the proof that every person has a unique fingerprint. It is often decisive[154] and it is therefore analogous to DNA evidence when considering whether it can prove guilt beyond reasonable doubt.

Forbes sought leave to appeal to the High Court in May 2010 in what would have been a landmark case for DNA evidence in criminal trials. The High Court however refused the application, with French CJ upholding the argument of the ACT Court of Appeal that it was open for the jury to convict on DNA evidence alone.[155] It was found that this case was 'not a suitable case to consider the larger question which the applicant seeks to agitate'[156] — whether DNA evidence alone is sufficient to sustain a conviction beyond reasonable doubt.

Hillier

Steven Wayne Hillier[157] was charged with the 2002 murder of Ana Louise Hardwick in Canberra. The case against the defendant was circumstantial. DNA evidence that connected a sample of DNA taken from the deceased's pyjamas to the defendant was adduced. The possibility of contamination and/or indirect transfer from the couple's children to the pyjamas was discussed in a number of the judgments in this case.

Hillier exercised his right to elect trial by jury in the first trial.[158] Later, when the case was retried, he elected trial by judge alone.[159] The initial trial before Gray J and a jury in the Supreme Court of the ACT was heard in November 2004 and Hillier was found guilty of murder. Following a complex appeal process his conviction was quashed and he was retried.

The second decision of the Court of Appeal found that:

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[152] *Thomas v The Queen* (1960) 102 CLR 584; *Green v The Queen* (1971) 126 CLR 28.

[153] *R v Cavkic* (2005) 12 VR 136.

[154] *Forbes v The Queen* (2009) 167 ACTR 1, [39].

[155] *Forbes v The Queen* [2010] HCATrans 120 (18 May 2010) 2755.

[156] Ibid.

[157] *R v Hillier* [2010] ACTSC 33 (16 April 2010).

[158] *Supreme Court Act 1933* (ACT) s 68B.

[159] This is no longer possible for most serious offences following the introduction of the *Criminal Proceedings Legislation Amendment Act 2011* (ACT). See amended s 68B and Schedule 2 of the *Supreme Court Act 1993* (ACT) with stricter requirements for jury trials in relation to serious offences.

> The presiding judge, correctly in our view, directed the jury that they had to be satisfied beyond reasonable doubt that Mr Hillier's DNA was found on the deceased's pyjamas and was not there as a result of indirect transference via either of the children.[160]

The defence submitted to the court that this approach should be endorsed in the final Supreme Court hearing. The prosecution submitted that the DNA evidence itself should not have to be proven beyond reasonable doubt because it was not an intermediate fact nor an indispensable link in the chain of reasoning for this case.[161] Besanko J agreed that the DNA evidence might not be seen as an indispensable link in the chain of reasoning towards an inference of guilt.[162] Nevertheless, if the DNA evidence is of great importance in establishing the presence of an accused at a crime scene, as in this case, then before it may be relied on it must be proved beyond reasonable doubt as belonging to the accused.[163]

Besanko J concluded that the DNA evidence could not be proved beyond reasonable doubt. Samples containing DNA material were taken from the deceased and a few mixed profiles were found, including, at different points, a profile that could have come from the deceased, a profile that could have come from the accused and a profile from an unknown person. A repeated tape lift sample from the same site some years later in 2009 did not reveal a DNA profile that could have matched the accused. The defence raised the possibility of contamination and/or indirect transfer of the accused's DNA from their children to the deceased. A forensic expert from the Australian Federal Police testified under cross examination that the detection of the DNA in the initial sample that 'matched' the accused may have occurred because of contamination.[164]

Besanko J was concerned about the lack of proper procedure in handling items from the crime scene in a search room where other items relevant to the case were stored.[165] These included items taken from the accused's home that would have contained samples of his DNA. Contamination could not be excluded as a reasonable possibility for at least one of the samples of DNA evidence. The events in the search room and the irreplicability of the finding of a DNA profile that could include the accused, led Besanko J to rule that there was the possibility of contamination. Hillier was consequently found not guilty of murdering the deceased in his final trial.

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[160] *Hillier v The Queen* (2008) 1 ACTLR 235, 245.

[161] *Chamberlain v The Queen (No 2)* (1984) 153 CLR 521; (1990) 170 CLR 573.

[162] *R v Hillier* [2010] ACTSC 33 (16 April 2010), [20].

[163] With authority from *R v Pantoja* (1996) 88 A Crim R 554, 583 (Abadee J); *R v Fletcher* (1998) 2 Qd R 437, 440–441 (Lee J).

[164] *Hillier v The Queen* (2008) 1 ACTLR 235, 247 [8].

[165] Ibid [12].

The strength of the DNA evidence in this case was paramount and crucial in ascertaining whether the accused was present at the crime scene at the time of the deceased's murder. Because the DNA evidence was crucial to the circumstantial case, the court ruled that the DNA evidence must be proved beyond a reasonable doubt. A risk of contamination was raised by the defence, and together with the identification of a DNA profile of an unknown person, this led to the ruling that the DNA evidence could not be proved to the requisite standard.

Hillier suggests that where the DNA evidence is of great importance, it may have to be proved beyond a reasonable doubt. It may be done by demonstrating that there has not been contamination of the samples or indirect transfer of an innocent person's DNA to a crime scene or evidence or where the DNA evidence does not contain mixed profiles or is otherwise weak evidence. Elimination of the possibility of contamination necessitates that lawyers develop an understanding of the evidence gathering process prior to receiving a case brief and investigate whether there was risk of contamination at the crime scene, in the laboratory or because of the handling of the evidence in the chain of custody. Lawyers should also consider whether there are any outliers in the DNA mixed profile that might suggest an unknown person's DNA was present. This may suggest in some cases that contamination is a possibility. *Hillier* raises these questions as they must be addressed by prosecution and defence counsel, both in establishing the proof value of DNA evidence for the prosecution, and in raising a reasonable doubt for the defence.

It is now well established that a jury may be left to decide on the guilt or innocence of an accused based on DNA evidence alone. This has implications for prosecutors when making decisions about whether to prosecute, and for defence lawyers where DNA evidence is the only circumstantial evidence against their clients. Given that miscarriages of justice can occur because of contaminated DNA evidence,[166] and some cases where contamination has occurred have been DNA-only trials,[167] the decisions in *Forbes* and *Hillier* reinforce the importance of lawyers understanding DNA evidence so that they accurately present and challenge the evidence in court. Again, this is an area that has not been adequately explored in the research. Questions about lawyers' experiences with, and management of, DNA evidence in this regard are explored in this study.

[166] See 2.4.

[167] See *R v Jama* [2008] VCC 0886.

2.4 Reviews of forensic process

This research has drawn on a number of recommendations directed at lawyers and the legal profession from two primary reviews of forensic process — the Vincent Report in Victoria, Australia[168] and the NAS Report in the United States.[169] These two reports demonstrate disquiet about the use of forensic evidence in criminal prosecutions, with the Vincent Report in particular focusing on how DNA evidence led to a miscarriage of justice in the Victorian County Court.[170] In addition to these reports, recommendations from Australian Royal Commissions over the past thirty years are briefly introduced, primarily to demonstrate that the concerns discussed in the Vincent and NAS reports are not new. The present research does acknowledge that there are a great number of committee and government reports into the use of forensic science in adversarial legal systems, but to explore these in detail is beyond the ambit of this research. This study needed to focus on only the most recent and relevant reports for the project jurisdictions and those focused on DNA evidence or with similar concerns or considerations for lawyers as in this study in other worldwide reports or commissions. More recently, the United States President's Council of Advisors on Science and Technology released a report, (the PCAST Report), which investigates the scientific validity of the feature-comparison methods of forensic testing.[171] Although DNA evidence is discussed, the report does not make recommendations relevant to the field of DNA evidence or analysis that would influence the behaviour of legal professionals in criminal trials. The focus of this thesis is on the Vincent and NAS Reports. The recommendations discussed in the reports below provide further justification for this research into the understanding and management of DNA evidence by Australian lawyers.

2.4.1 Vincent Report (Victoria)

> the DNA evidence was, like Ozymandias' broken statue in the poem by Shelley, found isolated in a vast desert.[172]

On 21 July 2008, a sequence of events occurred that led to an innocent man, Mr Farah Abdulkadir Jama, being convicted of rape in the County Court in Victoria and imprisoned for six years with a non-

[168] Vincent Report, above n 2.

[169] NAS Report, above n 5.

[170] *R v Jama* [2008] VCC 0886.

[171] Executive Office of the President President's Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods* (2016) Office of the President of the United States, <https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf>.

[172] Vincent Report, above n 2.

parole period of four years.[173] On 7 December 2009, prosecutor Brett Sonnet alerted the Victorian Court of Appeal that a 'substantial miscarriage of justice'[174] had occurred in the case, most likely due to a problem at the Victorian Institute of Forensic Medicine (VIFM) when Jama's sample and another sample were collected. Jama was immediately acquitted; an apology was made and he was awarded an ex-gratia payment of $525,000 by the Victorian Government.[175]

On 31 March 2010, former Supreme Court Justice the Hon Frank Vincent revealed the extraordinary case of contamination that had occurred in this Victorian case.[176] The report is an important one for all Australian criminal lawyers, because the ease with which mistakes like those that occurred in this case can be made is real and relevant across jurisdictions.

Jama was accused of raping a 48-year-old woman who was found semi-conscious in a nightclub toilet cubicle in Doncaster, Victoria.[177] With no recollection of the evening, the victim was taken to a Crisis Care Unit ('CCU') for physical examination and further tests. Routine internal swabs found semen that was later matched via the Victorian DNA database to Jama. He was subsequently convicted of rape.

More than fourteen months later Jama was encouraged to appeal the guilty verdict by newly engaged defence counsel. Brett Sonnet was appointed as prosecutor for the appeal. He investigated the case files and asked how Jama's DNA came to be on the Victorian database. Sonnet discovered that the forensic medical officer who had taken a swab from the victim had also taken a swab from Jama's mouth for a separate and unrelated matter on the previous day.[178] His DNA had been placed on the database less than 48 hours before he was matched to the semen sample at the Victorian Police Forensic Science Department (VPFSD) in Macleod.

The most likely explanation for Jama's DNA sample being found on the swab taken from the victim was found to be contamination.[179] In his report, Vincent found that the standard of cleaning of the examination rooms was inadequate for eliminating the presence of DNA. The cleaning that was routinely carried out at the CCU was directed at maintaining infection control, not avoiding the spread

[173] Ibid.

[174] Kate Hagan, 'DNA fiasco: rape conviction quashed' *The Age* (online), 8 December 2009 <http://www.theage.com.au/national/dna-fiasco-rape-conviction-quashed-20091207-kfc3.html>.

[175] Reid Sexton, 'Man Paid $525,000 for wrong conviction', *The Age* (online), 30 June 2010 <http://www.theage.com.au/victoria/man-paid-525000-for-wrong-conviction-20100629-zjko.html>.

[176] Vincent Report, above n 2.

[177] Ibid.

[178] Ibid 9–10.

[179] Ibid 48.

of DNA.[180] The level of cleaning that would have been required of surfaces and equipment in the CCU to remove all traces of DNA was not routinely conducted.

An investigation into the incident was requested by the Victorian Institute of Forensic Medicine (VIFM) and the Vincent Report was commissioned.[181] In the report, Vincent acknowledges the assistance of the agencies and individuals involved in the initial case, all of whom were concerned about how their procedures and practices could allow for contamination to occur.[182] All the agencies involved wanted to improve these procedures and practices so that further miscarriages of justice would be prevented.

The Vincent Report discusses several important considerations for forensic scientists, investigating officers and the legal community when working on cases involving DNA evidence. The Vincent Report particularly criticised the police response; the interpretation and use of scientific opinion; the decision to proceed with a trial and the prosecution and defence approaches in this case.

The DNA evidence

> the DNA evidence provided the only foundation for concluding that a crime had been committed at all, and then constituted the only means of identifying the perpetrator.[183]

There were no fingerprints, witnesses, CCTV footage or any other physical or biological evidence that a rape had even been committed in this case.[184] The decision to proceed on DNA evidence alone has been highly criticised.[185] Throughout his investigation, Vincent found that the DNA evidence was perceived to possess 'an almost mystical infallibility that enabled its surroundings to be disregarded.'[186] Only a matter of weeks before the appeal case was heard did the parties begin to realise the potential errors in the investigation and interpretation of the DNA results.

Further issue was taken with the prosecution's decision to proceed with the case to trial.[187] There was evidence that the police officer responsible for the case had enquired as to the likelihood of contamination[188] but was reassured that it was not possible for this to have occurred in the laboratory. As a result, the officer prepared a brief of evidence with only DNA evidence to support an inference

[180] Ibid 21.
[181] Ibid 7–8.
[182] Ibid 6.
[183] Ibid 10–11.
[184] Ibid 17.
[185] Ibid 10–12, 17, 30–38.
[186] Ibid 11.
[187] Ibid 30–32.
[188] Ibid 24.

of guilt.[189] The Vincent investigation obtained advice from Dr James Robertson, a forensic scientist with the Australian Federal Police and now a member of staff at the University of Canberra.[190] Robertson maintains that like all other evidence, whether DNA evidence can be seen as 'reliable and probative in the determination of disputed issues of fact involves consideration of a range of factors.'[191] In this case, there was no consideration of the lack of other evidence surrounding the offence.

Vincent stressed that because the DNA evidence was used both to allege that a crime had been committed, and to establish the identity of the perpetrator, care was required in this case. This was particularly the case given the lack of corroborating evidence. In response to the participants' approach to the DNA evidence, Vincent stated,

> I have been left with the deep impression that at virtually every point, and by almost everyone involved, it was handled with so little insight into the issues which it presented that no need was seen to explore further or conduct research into them.[192]

Jama's case and the Vincent Report have profound implications for the legal profession and criminal cases involving DNA evidence. Recommendations from the report encompass scientific procedures for CCUs, cleaning procedures for the Victorian Institute of Forensic Medicine and reporting requirements for police investigators and lawyers.[193]

Recommendation 9 of the report discusses police training on the use of DNA evidence for both intelligence and evidentiary purposes — particularly when there is minimal corroborative evidence.[194] It is important to ensure that police officers understand DNA evidence and the possibilities for contamination. However, the Vincent Report does not recommend how best to achieve this. Accordingly, this is followed by recommendation 10 for legal practitioners.

Recommendation 10 is that the Judicial College of Victoria, the Law Institute of Victoria and the Victorian Bar Council conduct courses that assist legal practitioners and members of the judiciary in the appropriate use and nature of DNA evidence in the criminal justice system.[195] These courses have the potential to ensure that lawyers have greater understanding of the forensic process, and that open

[189] Ibid 30.
[190] Ibid 6.
[191] Ibid 30.
[192] Ibid 11.
[193] Ibid 48–56.
[194] Ibid 55.
[195] Ibid 56.

discussion of the potential for human error in DNA evidence occurs. How successful these courses are in achieving these objects remains to be seen.

The Australian Law Reform Commission (ALRC) echoed these recommendations in their 2003 report 'Essentially Yours: The Protection of Human Genetic Information in Australia.'[196] Chapter 44 of the criminal proceedings section of the report contains recommendation 44.1 which is that the 'National Judicial College of Australia and the Law Council of Australia (through its constituent professional associations) should develop and promote continuing legal education programs for judges and legal practitioners, respectively, in relation to the use of genetic information in criminal proceedings.'[197] The present study seeks the views of lawyers about their experience of legal education in this area and whether and how it is relevant to their legal practice. This is discussed in detail in Chapter 7.

In his commentary on the Vincent Report, Gans suggests that the rules of evidence were partly implicated in causing this miscarriage of justice.[198] He notes that Victorian courts, like those in other Uniform Evidence Act jurisdictions in Australia, assume that jurors, once they hear that an accused is linked to another similarly heinous crime, will be more inclined to convict regardless of the strength of the defence.[199] In *Jama*, the jury was not made aware that his DNA had been taken in an unrelated matter, though no charges had been laid. This was because of the assumption described by Gans.[200] The Vincent Report does not engage with the fact that evidence law's usual management of the risk of prejudice from unrelated events, may be dangerous when applied to evidence of the investigative origins of DNA evidence.[201] Had that been understood in *Jama* then the origins of the first sample of DNA evidence may have been explored and it may have revealed that Jama had given a sample in the same room, to the same person less than 48 hours prior to the victim's sample being taken.

The *Jama* case led to questions about the safety of convictions based on DNA evidence alone and raised doubt about the use of DNA evidence in criminal trials generally, particularly those with little or no corroborative evidence of guilt.[202] Vincent highlights how easily contamination can occur and be missed by those investigating, prosecuting and defending criminal matters. The report demonstrates

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[196] Australian Law Reform Commission (ALRC), *Essentially Yours: The Protection of Human Genetic Information in Australia*, Report 96 (2003) <http://www.alrc.gov.au/publications/44-criminal-proceedings/improving-use-dna-evidence-trial>, Chapter 44, Criminal Proceedings.

[197] Ibid.

[198] Jeremy Gans, 'Ozimandias on Trial: The Problem of Fair Hearings in DNA-only Cases' (13 August 2010) *University of Melbourne Legal Studies Research Paper No. 498* <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1657786>.

[199] Ibid.

[200] Ibid.

[201] Ibid.

[202] Vincent Report, above n 2, 45–46.

that legal bodies and staff have a responsibility to provide and partake in legal education that will teach them about the threats to the integrity of DNA evidence. Whether these recommendations are adopted will be extremely important in preventing further miscarriages of justice in Australia. By identifying the problems lawyers have with DNA evidence and exploring their experience of legal education in this area, this study aims to explore the extent to which the recommendations made in this report are being implemented and to assist both lawyers and those providing legal education courses to improve their practice in this area.

2.4.2 NAS Report (United States)

In 2009, the United States National Academy of Sciences released its report about forensic sciences. The NAS Report was commissioned after the *Science, Justice, Commerce and Related Agencies Appropriations Act* of 2006[203] came into force. The United States Congress directed the Academy to investigate the significant improvements needed in forensic science in the United States. The preface to this report recognised that both systemic and scientific advancements were needed in a number of forensic disciplines, to make sure they provide reliable results, establish enforceable standards and promote a best standard approach that is consistently applied.[204]

In all testimony presented to the Committee responsible for the report, there was the overwhelming consistency of the following message:

> The forensic science system, encompassing both research and practice, has serious problems that can only be addressed by a national commitment to overhaul the current structure that supports the forensic science community in this country. This can only be done with effective leadership at the highest levels of both federal and state governments, pursuant to national standards, and with a significant infusion of federal funds.[205]

The responsibility for investigating these issues, and making recommendations to achieve this critical goal were given to a committee formed under the auspices of the National Academies' Committee on Science, Technology, and Law and Committee on Applied and Theoretical Statistics in 2006. The committee was made up of members of the forensic science and legal communities and a diverse range of scientists.

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[203] Science, Justice, Commerce and Related Agencies Appropriations Act of 2006, Pub Law No 109-108, 119 Stat 2290 (2005).

[204] NAS Report, above n 4, xix.

[205] Ibid xx.

The NAS Report generated many recommendations for the various forensic disciplines and practitioners working within those disciplines. Legal practitioners were included in those disciplines, particularly with respect to further legal education.

The NAS Report discussed the insufficient education and training of all parties involved in the forensic science system. Recommendation 10 stated: 'NIFS should also support law school administrators and judicial education organisations in establishing continuing legal education programs for law students, practitioners and judges.'[206]

The Committee recognised that although having a 'checklist' for the admissibility of forensic evidence is important,[207] this is not always sufficient to ensure the integrity of the evidence and the approaches employed by different forensic science disciplines are not always understood by the judiciary or legal practitioners. Any advancement in the forensic sciences, the NAS Report argues, should be notified directly to legal scholars and practitioners. Legal education should enhance that connection by allowing students to take cross-institutional studies and by offering joint degrees or courses in the forensic science disciplines.[208]

Prosecutors and defence lawyers in America have reported feeling as though they must make the presentation of forensic evidence as 'visually interesting and appealing as such presentations appear to be on television'.[209] Support for more interesting visual presentation of DNA evidence in the form of a tutorial was also discussed by Goodman-Delahunty and Hewson.[210]

Forensic science has been described as the 'handmaiden of the legal system'[211] primarily because courts often place great emphasis on forensic science. Nevertheless, they often do so without fully understanding the limitations of the various disciplines. This means that there is always the risk of reliance on 'junk science' as evidence in court.[212] Quite often judges and lawyers lack the scientific

[206] Ibid Recommendation 10, 28.

[207] Edwards, above n 80.

[208] NAS Report, above n 4, 27.

[209] Ibid 48.

[210] Goodman-Delahunty and Hewson, above n 5, 1 and see discussion at 6.2.1 on the difficulties lawyers have with probabilities ratios and DNA evidence.

[211] D L Faigman, M Saks, J Sanders and E Cheng (eds), *Modern Scientific Evidence: The Law and Science of Expert Testimony* (Thomson West, 5th ed, 2008-9) 6.

[212] For commentary in this area see Gary Edmond, 'Impartiality, Efficiency or Reliability? A Critical Response to Expert Evidence Law and Procedure in Australia', above n 72.

expertise necessary to comprehend and evaluate forensic evidence. This renders the criminal justice system inadequate to the task of curing the documented ills of the forensic science disciplines.[213]

The third chapter of the NAS Report, 'The Admission of Forensic Science Evidence in Litigation' argues that the legal system is ill-equipped to correct the problems of the forensic science community. DNA evidence does not suffer from the lack of peer-review seen in many forensic disciplines because it has the capacity to 'consistently and with a high degree of certainty support conclusions about individualization.'[214] That is, it has scientific and peer-reviewed validation over a number of years proving that the scientific methods used are sound.[215]

The NAS Report does however demonstrate the importance of lawyers' questioning the scientific basis of any forensic evidence, including understanding the scientific principles behind DNA evidence. Underlying the admission of all forensic evidence should be a consideration of whether the discipline is founded on a reliable scientific methodology, and the extent to which a discipline relies on human interpretation that can be tainted by human error.[216] Although DNA has a history of extensive and applied scientific research, publication and national standards for quality assurance and quality control, there are areas of DNA evidence that are not so widely researched, including low copy DNA[217] and mixed profiles.[218] Lawyers may understand the scientific principles and research behind DNA evidence, but it may be that DNA evidence should be challenged on other grounds, for example with regard to the collection, processing, storage and handling of DNA samples.

2.4.3 Australian Royal Commissions and overseas reports

Although the Morling Royal Commission[219] into the disappearance of Azaria Chamberlain did not directly report on DNA evidence, the case and the numerous appeals that followed helped to shape the legal and forensic environment for lawyers and expert witnesses in Australian courts today. The

[213] NAS Report, above n 4, 85.

[214] Ibid 87.

[215] Note here though the arguments of W. C Thompson in 'Forensic DNA Evidence: The Myth of Infallibility' in Sheldon Krimsky and Jeremy Gruber (eds), *Genetic Explanations: Sense and Nonsense* (Harvard University Press, 2013), who recognises that many of the problems identified in that report also apply to DNA evidence, 228.

[216] Ibid.

[217] See William C Thompson, Laurence D Mueller and Dan E Krane, 'Forensic DNA Statistics: Still Controversial in Some Cases' (2012) *The Champion: Legal Studies Research Paper Series No. 2013-122*, 12.

[218] See discussion of *R v Meyboom* [2011] ACTSC 13 at 2.3.2 above.

[219] T R Morling, *Royal Commission of Inquiry into Chamberlain Convictions* (1987) National Library of Australia <http://trove.nla.gov.au/work/12696357?selectedversion=NBD5589406>.

lessons to be learnt from the Morling Commission's enquiry are numerous, yet cases such as *Jama* demonstrate that they are difficult lessons to learn.

The Lindy Chamberlain case involved the disappearance of 9-week-old Azaria Chamberlain from a camp ground in the Uluru-Kata Tjuta National Park (Ayers Rock) in 1980. Although her mother, Lindy Chamberlain, maintained that a dingo took her baby, the State charged her with murder and what ensued involved a Supreme Court of the Northern Territory trial, two appeals, including one to the High Court where the appeal was dismissed,[220] three coronial inquests and finally a Royal Commission. After the fall of a climber at Uluru in 1988 led police to evidence that confirmed Lindy's innocence, she was released from prison immediately, pending further investigation. After considering all evidence in considerable detail shortly afterwards, the Morling Commission recommended that the convictions be overturned and after a total of three years in prison, Lindy Chamberlain and Michael Chamberlain (who had been charged with being an accessory and given a suspended sentence) were pardoned of charges. The final inquest in 1995 allowed for the cause of death on Azaria's death certificate to read 'cause unknown' rather than 'murder'.

Although the science used in Chamberlain could no longer be considered novel, science continues to improve and present new challenges to courts around the world. Some of the evidence in this case was given by experts who did not have the 'experience, facilities or resources necessary to enable them to express reliable opinions on some of the novel and complex scientific issues which arose for consideration.'[221] Also of concern for lawyers and experts presenting evidence in court was the fact that 'some experts who gave evidence at the trial were over-confident of their ability to form reliable opinions on matters that lay on the outer margins of their fields of expertise.'[222] This shows that lawyers need to be aware of the experience and knowledge of 'experts'. It is both acceptable and wise to question experts about their qualifications and experience with the information they are presenting in court. If witnesses testify in court without the requisite knowledge or experience, and lawyers do not ensure this is made obvious, juries and judges may rely on their evidence and miscarriages of justice may ensue.

[220] *Chamberlain v The Queen (No 2)* (1984) 153 CLR 521 (Gibbs CJ, Mason and Brennan JJ majority); (Murphy and Deane JJ minority).

[221] *Re Conviction of Chamberlain* (1988) 93 FLR 239, 253.

[222] Ibid 252.

The importance of the lawyers' questioning the credentials of experts was also noted in the Shannon Royal Commission into the 1978 conviction of Edward Splatt for murder in Adelaide, South Australia.[223] Shannon stressed that representatives of the legal system have a serious obligation to ask 'such detailed and probing questions of the scientists as are likely to elicit the proper evidence.'[224] Although the incompetence of forensic witnesses was particularly criticised by Morling and Shannon, lawyers were also said to fall prey to fallibility and error in using forensic evidence in court.[225]

2.5 Conclusion

This chapter began by introducing Australian and New Zealand research on the use of DNA and forensic evidence by lawyers, jurors, forensic scientists and judges in criminal cases. The research conducted by ESR in New Zealand and by Findlay and Grix in Australia demonstrates that lawyers attribute a high level of certainty to DNA evidence, suggesting that they are less likely to test or challenge DNA evidence than other forms of circumstantial evidence in criminal cases. These studies pointed to the need for further research about lawyers' understanding of DNA evidence. The present study seeks to fill this gap by exploring this matter with lawyers themselves and by obtaining observations from judges and forensic scientists.

Forensic scientists and judges suggest that there are problems with lawyers' presentation of DNA evidence and that lawyers lack a sound understanding of pre-trial forensic processes. These difficulties are addressed in the present study, with the research questions[226] seeking to obtain information about what difficulties lawyers encounter with DNA evidence. The data and research findings on these difficulties are presented in Chapter 6.

According to Briody,[227] jurors place significant emphasis on DNA evidence in cases involving serious offences. This means that it is important that lawyers present DNA evidence accurately, particularly because research suggests that jurors harbour incorrect assumptions about the strength of DNA evidence and the meaning of probability ratios.

The case law, primarily in the ACT Supreme Court and the High Court of Australia, demonstrates a number of contentious areas in relation to DNA evidence that must be considered by lawyers. The

[223] South Australia, Royal Commission report concerning the conviction of Edward Charles Splatt, *Royal Commission of Inquiry in Respect to the Case of Edward Charles Splatt* (1984).

[224] Ibid [52].

[225] Ibid [58].

[226] See 4.4.1 at 84-87.

[227] Briody, 'The Effects of DNA Evidence on Homicide Cases in Court', above n 5.

way DNA evidence is expressed, through numbers and words was considered by the High Court in *Aytugrul* and discussed in *Whyms*; probability ratios and statistics were considered in *Meyboom* and *Forbes* and issues relating to reliance on DNA evidence as the only evidence of guilt and what that means for the criminal standard of proof were discussed in *Forbes* and *Hillier.* These cases provide the legal framework in relation to DNA evidence for practising lawyers Australia-wide. They also constitute the legal background to the first area of investigation for this research — lawyers' every day understanding and use of DNA evidence in criminal trials. Research questions that explore these issues are outlined at 4.3 below and the results discussed in Chapter 5. Victorian lawyers have witnessed the influence of the miscarriage of justice in *Jama* and subsequent Vincent Report on criminal law practice in that state, where legal practice and use of DNA evidence was central to a substantial miscarriage of justice. Both the Vincent Report and the NAS Report call for lawyers to undertake further education in this area, to prevent future miscarriages of justice resulting from poorly handled DNA evidence. The research questions on DNA education investigated in this thesis are discussed at 4.4 with the data and findings presented in Chapter 7.

Chapter 3 explains the socio-legal context in which this research took place. It introduces scientific principles associated with DNA evidence and identifies emerging and more contentious areas of DNA that lawyers will likely contend with in future criminal cases. The adversarial system of law is introduced and the procedural way lawyers must handle DNA evidence is also explained.

3 DNA in a legal context

3.1 Introduction

The use of scientific evidence, such as DNA evidence, in an adversarial legal system requires an understanding of the basic tenets of two very different disciplines: science and law. This chapter introduces basic but important principles of DNA evidence, the forensic science system that DNA evidence forms part of and the legal system in which criminal trials take place in Australia. This provides the basic scientific and legal context of the present study. Exploring the philosophical underpinnings of the science/law relationship is beyond the ambit of this research. There is a large body of research in this area that looks at the similarities and differences in these two disciplines.[1] The information provided in this chapter is not intended to be comprehensive and cover the field. It sets the context and foundation for detailed analysis in the later chapters. This research focuses on the use of DNA evidence in a legal context, which is why it is necessary to explain the legal and forensic context of the research. This chapter introduces definitions of forensic science and DNA evidence and explains some of the emerging areas of concern for lawyers in managing DNA evidence. It lays the foundation for the detailed discussion of the difficulties lawyers face in managing and using DNA evidence in Chapter 6. The nature of the adversarial system is introduced and the duties to disclose information about DNA evidence are explained. These topics are foundational to the discussion of the tensions created by the adversarial process for lawyers in gaining information about DNA evidence considered in detail in Chapter 5. The environment in which experts give evidence is also discussed, including evidentiary rules that allow for expert opinion evidence like DNA evidence to be adduced. This chapter explores relevant procedural rules (and lack thereof) governing criminal legal practice to understand the foundations upon which lawyers are required to build their criminal practice. How they practice every day is not only influenced by the limited guidance provided by these rules but also by the realities of the adversarial legal system discussed in Chapter 5. Finally, because it may be argued that lawyers have an obligation to understand the evidence they adduce or challenge in criminal trials as this helps to ensure a fair trial, relevant general principles relating to the right to a fair trial are introduced. Whether lawyers are meeting this obligation is also discussed in Chapter 5.

[1] See, for example Sheila Jasanoff, 'Serviceable Truths: Science for Action in Law and Policy' (2015) 93 *Texas Law Review* 1723; Deborah M H Freeland, 'Speaking Science to Law' (2013) 25 *The Georgetown International Environmental Law Review* 289; Sheila Jasanoff, 'Law's Knowledge: Science for Justice in Legal Settings' (2005) 95(S1) *American Journal of Public Health* S49; and Pauline Newman, 'Law and Science: The Testing of Justice' (2000) 57 *New York University Annual Survey of American Law* 419.

3.2 Forensic science and DNA expert evidence

Forensic science is science that is used for the purpose of the law, and so any science that may be called on in resolving legal disputes could be termed 'forensic' science.[2] A more narrow definition from Cobb is the use of science in the 'investigation of crime by police and by the courts as evidence in resolving the issue in any subsequent trial.'[3] Crispino et al[4] and Margot[5] argue that forensic science is a scientific discipline in its own right, rather than a collection of scientific disciplines applied to criminal situations and define this 'science' as 'identifying and associating traces for investigative and security purposes.'[6] Whether forensic evidence is in fact a scientific discipline in its own right does not influence the way lawyers utilise DNA evidence in criminal cases. DNA evidence has its basis in forensic biology and this places it amongst the forensic science disciplines.

3.2.1 Deoxyribonucleic acid (DNA)

DNA — deoxyribonucleic acid — is the blueprint for life, made up of genetic information found in almost every cell of every organism. Humans and animals are produced by combining a male reproductive cell (sperm) and female reproductive cell (ovum). These cells must combine to create a zygote with a full complement of DNA. Because all cells arise from the cell division that the zygote undergoes, all cells in a person's body have identical DNA. Each of the 46 chromosomes in a human cell are formed from one piece of a double stranded DNA, where two strands are wound around each other to form the 'double helix.'[7] Inside these strands is a supporting structure of protein. Because the DNA is coiled, a large amount can be present within the nucleus of one cell.

Although there are a few DNA analysis techniques used across the world, the most common approach is the use of short tandem repeat (STR) DNA sequences, because this is the recognised world standard used in DNA databases.[8] The United Kingdom can be credited with having the first DNA database for

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2 Peter Cobb, as cited in Peter White, *Crime Scene to Court – the Essentials of Forensic Science* (The Royal Society of Chemistry, 1998).

3 Ibid 2.

4 Frank Crispino et al, 'Forensic Science – A True Science?' (2011) 43(2–3) *Australian Journal of Forensic Sciences* 157.

5 Pierre Margot, 'Forensic Science on Trial – What is the Law of the Land?' (2011) 43(2–3) *Australian Journal of Forensic Sciences* 89.

6 Crispino et al, above n 4, 157.

7 Peter White (ed), *Crime Scene to Court – The Essentials of Forensic Science* (Royal Society of Chemistry, 1998) 305.

8 Peter Gill and Tim Clayton, 'The Current Status of DNA Profiling in the UK' in Jim Fraser and Robin Williams (eds), *Handbook of Forensic Science* (Willan Publishing, 2009) 29.

use in criminal investigations and it still has, in the National DNA database (NDNAD), the largest DNA database in the world.[9]

Extracting and 'fingerprinting' DNA was developed by Dr Alex Jeffreys, a geneticist at the University of Leicester in 1985. Jeffreys demonstrated that he could achieve discrimination between blood samples from different people by a process of analysis called restriction fragment length polymorphism (RFLP). This was done on the variable number of tandem repeat sections (VNTR) found in the non-coding part of a person's DNA.[10] The application of this profiling process to forensic science was described by Gill, Jeffreys and Werrett in the same year.[11] At this early stage of profiling, the RFLP approach used a multi-locus probe with a very high discriminating power in the millions, but low sensitivity, particularly regarding mixtures of DNA from more than one person. It also took a long time to process results — sometimes several weeks.[12] This developed into single locus probe RFLP profiling in 1990,[13] also achieving highly discriminatory results but slightly more sensitive and applicable to mixed profiles in a sample. It was however still a lengthy process. In 1991 a technique called polymerase chain reaction (PCR) was introduced. This amplifies DNA sections of interest by copying them numerous times — making the test highly sensitive.[14] This test could draw results in days rather than weeks, but match probability was low by comparison to RFLP profiling — according to Bramley[15] a ratio of 1 in 40. This made it useful only as an elimination tool so it could only be used for exculpating individuals, rather than as inculpatory evidence. It remains exculpatory in its current form.[16]

In 1994, a significant breakthrough in DNA analysis came in the form of DNA profiling for database purposes — analysis of STR loci[17] or microsatellites.[18] This method used the multiplex PCR technique for heightened sensitivity and greater speed of analysis and polyacrylamide gel electrophoresis

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9 Bob Bramley, 'DNA Databases' in Jim Fraser and Robin Williams (eds), *Handbook of Forensic Science* (Willan Publishing, 2009) 309, 309.

10 Alec Jeffreys, Victoria Wilson and Swee Lay Thein, 'Hypervariable "Minisatellite" Regions in Human DNA' (1985) 314 *Nature* 67; Alec Jeffreys, Victoria Wilson and Swee Lay Thein, 'Individual-Specific Fingerprints of Human DNA' (1985) 316 *Nature* 76.

11 Peter Gill, Alec J Jeffreys and David J Werrett, 'Forensic Application of DNA Fingerprints' (1985) 318 *Nature* 577.

12 Bramley, above n 9, 309.

13 Ibid.

14 Ibid.

15 Ibid.

16 Though see the 'reality' that interviewees face when DNA evidence is found to be exclusionary evidence that rarely excludes at 5.4 below.

17 Loci are locations on a chromosome and current DNA testing tests at ten loci — one is gender, with the remainder being unique to individuals, with exceptions of familial connections.

18 Colin Kimpton et al, 'Evaluation of an Automated DNA Profiling System Employing Multiplex Amplification at Four Tetrameric STR Loci' (1994) 106(6) *International Journal of Legal Medicine* 302.

because it led to fewer errors in the measurement of DNA fragment sizes with more precise values of alleles.[19] PCR amplifies STRs to levels that may be dated in age and the copies are separated according to size. The different sized STRs show up in a pattern of peaks on an electropherogram that is then compared against a database or against a suspect's pattern.[20] The small size of the STRs enables them to be taken from older and more degraded samples of biological material, as well as from fresh samples.[21] At first these tests were carried out on four loci, so that the match probability was about 1 in 40 000 for full profiles from unrelated individuals.[22] This increased to six STR loci in early 1995 with a match probability of 1 in 50 million and later, in a system called SGM Plus ('Second Generation Multiplex' Plus) the Forensic Science Service (FSS) in the UK could test simultaneously for the original 6 loci, a marker for gender and four new STR loci with a reported match probability of less than 1 in 1 billion.[23]

DNA profiling does not, and cannot, provide an absolute match between a sample and a particular person — it can only establish that it 'could have' or 'did not' come from that person.[24] This is because without testing everyone on the planet, it is impossible to determine whether the statement that 'everyone has a unique DNA' is true beyond a probability. For that reason, DNA evidence is always classified as circumstantial evidence by the courts and the legal system, in every case.

3.2.2 Emerging areas of DNA Analysis

Lawyers do not only use DNA evidence as it has traditionally been used, but may also use emerging areas of DNA analysis and testing. Two examples of the latter, for the purposes of introducing these issues for lawyers, are mitochondrial DNA and low copy analysis. Mitochondrial DNA (mtDNA) is a relatively new[25] analysis technique. It is a less informative marker that can assist in detecting DNA from highly degraded samples of biological material such as bone.[26] This technique is used for material

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[19] An allele is one member of a pair (or any of the series) of genes occupying a specific spot on a chromosome (called locus) that controls the same trait.

[20] Natasha Gilbert, 'DNA's Identity Crisis' (2010) 464 *Nature* 347.

[21] Bramley, above n 9, 309.

[22] Ibid.

[23] Ibid 310.

[24] Stephen Gutowski as cited in Ian Freckleton and Hugh Selby, *Expert Evidence in Criminal Law* (Sweet and Maxwell, 1999) 40.

[25] Mitochondrial DNA was discovered in the 1960s by electron microscopy as DNA-sensitive threads inside mitochondria, see Margit M K Nass and Sylvan Nass, 'Intramitochondrial Fibers with DNA Characteristics: I. Fixation and Electron Staining Reactions' (1963) 19(3) *Journal of Cell Biology* 593. It has only been used in court in more recent years however — see recent High Court case of *Atygrul v The Queen* [2012] HCA 15 for an example of its use in a criminal case.

[26] Gill and Clayton, above n 8, 37.

that is not suitable for RFLP or STR analysis[27] and tests may be conducted on samples that are too small for nuclear-DNA testing because while there are hundreds or thousands of mitochondria in a single cell, there is only one nucleus.[28] This then means that far fewer cells are needed for mtDNA testing, which makes it appropriate for use with degraded or limited samples of tissue. Mitochondria in all cells are copied from that of the zygote (fertilised egg) so all people in the maternal line of descent in a family have the same mtDNA sequence.[29]

In conducting research with eligible jurors in a mock trial setting, Kaye, Hans, Dann, Farley and Albertson found that the jurors 'generally recognized the limitations of mtDNA. The final probabilities of guilt supplied by the jurors suggest they were far from overwhelmed by the mtDNA match and statistics' and during deliberations there was discussion that focused on the other evidence in the case.[30]

Low copy number analysis is an area of DNA analysis that draws DNA profiles from very small amounts of genetic material. It is a contentious area of science,[31] with some opposing its use because it doesn't permit profiles to be reproduced, samples are prone to contamination and results are based on a lack of scientifically validated means for deciding their accuracy.[32] Standard DNA tests require about 200 picograms of DNA — around 33 cells, and double that for haploid sperm cells. Producing DNA profiles from very small samples (in some cases only a few microscopic cells) requires ways of increasing the sensitivity of the analysis, including by running more PCR cycles to create more samples of the DNA,

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[27] David H Kaye et al, 'Statistics in the Jury Box: How Jurors Respond to Mitochondrial DNA Match Probabilities' (2007) 4(4) *Journal of Empirical Legal Studies* 797.

[28] Ibid 806.

[29] Ibid.

[30] Ibid 825.

[31] See for example: Peter Gill et al, 'An Investigation of the Rigor of Interpretation Rules for STRs Derived From Less than 100 pg of DNA' (2000) 112(1) *Forensic Science International* 17; Bruce Bedowle, Arthur J Eisenburg and Angela van Daal, 'Validity of Low Copy Number Typing and Applications to Forensic Science' (2009) 50(3) *Croatian Medical Journal* 207; Peter Gill and John Buckleton, 'A Universal Strategy to Interpret DNA Profiles That Does Not Require a Definition of Low Copy Number' (2010) 4 *Forensic Science International* 221. In 2015, a New York judge, Justice Mark Dwyer, refused to admit evidence of low copy DNA testing results in a criminal trial in Brooklyn, because 'to have a technique that is so controversial that the community of scientists who are experts in the field can't agree on it and then to throw it in front of a lay jury and expect them to be able to make sense of it, is just the opposite of what the "Frye standard" is all about.' See Shayna Jacobs, 'Judge Tosses Out Two Types of DNA Evidence Used Regularly in Criminal Cases' *New York Daily News* (online) 5 January 2015, <http://www.nydailynews.com/new-york/nyc-crime/judge-tosses-types-dna-testing-article-1.2065795>.

[32] Gilbert, above n 20, 347. This article uses the case of twin brothers Terence and David Reed who were accused and convicted of the murder of Peter Hoe in North Yorkshire, United Kingdom on 13 October 2006. The DNA profiles had been drawn from very small amounts of genetic material, and the appeal on the basis that a representative of the FSS in the UK overstepped her qualifications by speculating how the men's DNA came to be on two pieces of plastic, failed in late 2009.

or by purifying the sample after PCR has occurred to remove reagents. Gilbert found that the PCR-based quantitation methods may suggest that a sample does not contain DNA, yet technicians can still produce a partial sample.[33] Upon analysis of this sort of sample, fluctuations may occur. STRs present in the original sample may not appear on subsequent testing, known as 'allele drop out.'[34] On the other hand, profiles may show STRs that are not actually present in samples — the 'drop in effect', which may be caused by contamination of a sample.[35]

Generally, in low-copy profiling, scientists will split the limited DNA sample into three, running analyses on two samples with the third sample reserved for the defence. Peter Gill from the University of Strathclyde in Glasgow does not doubt the strength of the science used in low-copy profiling, and was involved in developing low-copy testing at the FSS in the UK.[36] Although the amount of material available for profiling is much smaller than that in standard analysis and drop-in and drop-out effects are more pronounced, this may be avoided by ensuring cleanliness in testing environments and monitoring negative controls.[37] Allan Jamieson, director of the Forensic Institute in Glasgow notes that the courtroom is not, however, the appropriate place to debate the validity and strength of low-copy DNA profiling.[38] Until issues around reliability have been adequately dealt with by the scientific community, this debate should continue to occur in that arena rather than the courtroom.[39]

A more recent development in DNA testing and profiling in the United States is that of Rapid DNA technology.[40] Researchers in that country have taken 'two sterile rooms, several instruments, and a highly-educated technician, and shrunken it to the size of a desktop printer'[41] known as a RapidHIT machine. Fully automated Rapid DNA machines run multiple, single-source biological samples simultaneously and can produce DNA profiles in approximately 90 minutes.[42] Developments like that

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33 Ibid.

34 Ibid 348.

35 Ibid.

36 Peter Gill et al, above n 31.

37 Ibid.

38 As cited in Gilbert, above n 20, 348.

39 An argument that Justice Mark Dwyer from the Supreme Court in New York agreed with in a recent case, discussed above n 31.

40 For a discussion of legal implications of Rapid DNA testing see Erin R Steward, 'Discussion and Evaluation: The Legality and Use of Rapid DNA Technologies' (2016) 84(4) *University of Missouri–Kansas City Law Review* 1133.

41 Stew Magnuson, 'DNA Testing Machine Reduces Labs to the Size of a Desktop Printer' (July 2013) *National Defence Magazine* <http://www.nationaldefensemagazine.org/archive/2013/July/Pages/DNATestingMachineReducesLabstotheSizeofaDesktopPrinter.aspx>.

42 For information on the machine, see Integenx, 'RapidHIT®ID: Instant identification. Anywhere.' (2015) <https://integenx.com/RapidHIT-id/>.

of Rapid HIT have the capacity to revolutionise legal investigations. The ramifications for the legal system were introduced and discussed by Steward.[43] There are concerns for privacy as suspects can have DNA tested and results of profiles in under two hours, often without legal representations present.[44] Steward also concludes that provided proper measures are followed and personnel are properly trained, Rapid HIT testing will improve search and seizure capabilities for investigations, and concerns of the constitutionality of these actions will be alleviated.[45] Although it will be a number of years before testing with machines like Rapid HIT is commonly utilised in Australia, lawyers must be familiar with emerging technologies as they come onto the market.

3.2.3 What is forensic science?

Forensic science seeks to help clarify three major issues facing police officers investigating an incident: first, has a crime been committed; second, who is responsible; and finally, if a person is suspected as being responsible, is there enough evidence to charge him or her and support a prosecution?[46] One of the basic tenets of forensic science is the Locard principle — that 'every contact leaves a trace'.[47] The 'trace' is the domain of the forensic scientist,[48] while it is the 'evidence' that the trace may become that is the domain of the police officer, investigator and finally, the lawyer.

Forensic scientists are most commonly called by the prosecution, although defence counsel may also engage an alternative expert to scrutinise forensic reports and samples obtained by the prosecution.[49] There are several ways that forensic biologists may demonstrate to the court that DNA evidence is reliable:

- The scientist giving the evidence may testify that he or she carried out the work personally or gave direct supervision to others who performed the work, or was under direct supervision by other qualified people. Witnesses may interpret factual evidence given by another witness under oath considering findings or outcomes. This might occur in situations where the defence calls alternative experts and the evidence of the prosecution is presented to the alternative expert for explanation. It may also occur if the alternative expert presents a different

[43] Steward, above n 40.

[44] Ibid 1148.

[45] Ibid 1151–1152.

[46] Cobb, above n 2, 7.

[47] Emond Locard, L'enquête Criminelle et les Méthodes Scientifiques (Ernest Flammarion, 1920).

[48] Margot, above n 5.

[49] See discussion at 5.8.1 on lawyer's hesitancy to do this and the realities associated with engaging experts for the defence.

recommendation or different evidence and the prosecution expert is asked to comment on that evidence and its interpretation in court.

- The methods used must satisfy the requirements for the expert opinion evidence exception to the exclusionary opinion rule in evidence law.[50] In Australia, in uniform Evidence Act jurisdictions[51] like Victoria and the Australian Capital Territory (ACT), the opinion rules in s 76 and s 79 of the uniform Evidence Acts impose conditions, designed to ensure the reliability of the evidence, on the admissibility of scientific expert opinion evidence.[52] Importantly, this requires that a person has specialised knowledge of the area on which they express an opinion based on their study, training or experience.[53]
- Where the scientific findings require interpretation, the basis of the interpretation (basis rule) must be made available to the scientific community and to the court.[54] This enables the basis of the interpretation to be tested scientifically and through the legal mechanism of cross-examination.

Forensic science aims to contribute to the finding of solutions to criminal problems and to assist the fact-finder by providing the most relevant and reliable evidence available. Margot sees forensic science as being a science that is distinctly applied to forensic *problems*, rather than being specific types of forensic chemistry or forensic biology.[55] The work of forensic scientists is not yet universally viewed as a true profession.[56]

3.2.4 The role of a forensic scientist

The role that forensic scientists play in the adversarial criminal justice system is a matter of debate among forensic scientists. It is important to define this role both generally and specifically in relation

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[50] See discussion of the opinion rule at 3.5.1 below.

[51] Australian jurisdictions with uniform evidence legislation include: Victoria, the ACT, Norfolk Island, NSW, the Northern Territory (NT) and Tasmania.

[52] By comparison, the United States, a common law jurisdiction, has what are known as '*Daubert* rules' that require that scientific evidence should be based on established scientific principles and methods, validated and, preferably, published so that they can be scrutinised by other members of the scientific community.

[53] See, for example, s 79 of the *Evidence Act 1995* (Cth):

79. Exception: opinion based on specialised knowledge

(1) If a person has specialised knowledge based on the person's training, study or experience, the opinion rule does not apply to evidence of an opinion of that person that is wholly or substantially based on that knowledge.

[54] Cobb, above n 2, 9.

[55] Margot, above n 5, 101.

[56] James Robertson, 'Forensic Science – a True Profession?' (2011) 43(2–3) *Australian Journal of Forensic Sciences* 105.

to DNA evidence, because this may have implications for their relationship with lawyers, the difficulties lawyers encounter in identifying the weaknesses and/or limitations of DNA evidence, the barriers and challenges facing lawyers in obtaining information about DNA evidence and the investigations that defence counsel conduct in relation to DNA evidence both pre-trial and at trial.

Margot argues that forensic scientists should become part of the investigative process — attending crime scenes and making decisions about the information collected based on investigative information and any other information that is relevant to the specific case.[57] He suggests that forensic scientists operate within the legal investigation, not outside of it and that they can play an important role in aiding the selection of 'traces' at a crime scene, thus determining what may later become evidence in a court of law. Margot's view supports the proposition that forensic scientists can become involved in legal investigations, because their knowledge of traces assists in the collection of forensic evidence on a case-by-case basis. This conception of the role of forensic scientists accords them a significant involvement in the investigative process and treats forensic science as a science that necessarily applies in legal situations, rather than as an unaffiliated, independent scientific field.

However, should forensic scientists become involved in the investigative process or work from a basis of knowledge about investigative facts, there may be a danger that bias will be introduced into their analyses and findings. Actual and perceived bias is one of the most significant concerns for forensic scientists.[58] For this reason, Mnookin et al[59] do not view the role of the forensic scientist as being that of a criminal investigator. Instead they believe that they need to know the basics of the scientifically relevant details, like the surface from which a fingerprint was lifted, but that they should not know about such things as a suspect's confession or previous convictions for serious crimes.[60]

Sequential unmasking is the process by which a forensic scientist interprets each item of evidence independently of other items of evidence or reference samples in a bid to reduce or eliminate contextual bias and other observer effects.[61] Sequential unmasking creates protocols that aim to

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[57] Margot, above n 5, 92.

[58] For example, see Itiel E Dror and Simon A Cole, 'The Vision in "Blind Justice": Expert Perception, Judgment and Visual Cognition in Forensic Pattern Recognition' (2010) 17(2) *Psychonomic Bulletin & Review* 161; Bryan Found, 'Deciphering The Human Condition: The Rise of Cognitive Forensics' (2015) 47(4) *Australian Journal of Forensic Sciences* 386.

[59] Jennifer L Mnookin et al, 'The Need for a Research Culture in the Forensic Sciences' (2011) 58 *University of California Los Angeles Law Review* 725.

[60] Ibid 770.

[61] Dan E Krane et al, 'Sequential Unmasking: A Means of Minimizing Observer Effects in Forensic DNA Interpretation' (2008) 53 *Journal of Forensic Science* 1006. For further and more recent discussion of contextual bias research in the forensic sciences, see Found, above n 58.

protect examiners from this sort of information, and potentially, from bias.[62] Sequential unmasking may prevent bias in forensic scientists — both conscious and unconscious — but it limits the role of the forensic scientist to the scientific element of their work and excludes the possibility of their adopting an investigative role of the kind suggested by Margot.

Forensic scientists and police officers[63] are responsible for collecting and interpreting traces. Those traces often become the bases for evidence in legal trials and therefore having access to forensic scientists pre-trial, and an ability to communicate with them during a trial, is important as an expert witness. Lawyers may need to investigate the integrity of forensic reports and the veracity of forensic investigations in the period leading up to a trial in court. Both these propositions have implications for the examination-in-chief and cross examination of a forensic scientist as an expert witness. If lawyers do not communicate with expert witnesses or are tactical in how and when they communicate with them, a defendant may not be receiving the fairest trial in the circumstances presented.

3.3 The adversarial system

> The lawyer is active, the judge passive. The lawyer partisan, the judge neutral. The lawyer imaginative, the judge reflective.[64]

Because the focus of this research is the experience of lawyers, the system within which lawyers introduce evidence to courts must be explored. As a common law country, Australia has an adversarial criminal trial system. Within this system, the judge's role is that of an impartial, independent arbiter, who determines questions of law that govern the proceedings, including issues relating to the admissibility of evidence. Juries or, in cases involving less serious, generally non-indictable offences, judicial officers, determine the outcome of disputes based on information presented by the parties themselves, and/or their lawyers. Because the trial process is governed by rules of evidence and procedure, court procedure generally guarantees a role for lawyers in the adversarial process.[65] To determine the fundamental role of lawyers in adversarial systems it is important to ask whose interests do lawyers serve and whose values do they represent?[66]

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62 Krane et al, above n 61.

63 Particularly for volume crimes.

64 Justice Peck, describing a view with which he disagrees, cited in M Frankel, 'The Search for Truth: An Umpireal View' (1975) 123 *University of Pennsylvania Law Review* 1031, 1035.

65 Stephen Bottomley and Simon Bronitt, *Law in Context* (Federation Press, 3rd ed, 2006).

66 Roy Simon, Carol Needham and Burnele Powell, *Lawyers and the Legal Profession: Cases and Materials* (Matthew Bender and Company, 4th ed, 2009) 183. The role of lawyers in the adversarial system is discussed at 3.3.

Under an adversarial system, the parties (and their lawyers) are responsible for defining the issues in question and for initiating dispute resolution.[67] The system presupposes two advocates representing their parties' cases before an impartial adjudicator — either a judicial officer of some form alone or combined with a jury of the parties' peers. The adversarial system not only takes the fact of disagreement between parties into account, but relies on it, and any final judgment of a court will be informed by contrasting points of view. The role of lawyers in the adversarial system is to present these contrasting points of view in the interests of their clients. Accordingly, the adversarial system serves the public interest of achieving justice in a unique way while ensuring individuals can present their cases and be represented.

This contrasts with the inquisitorial system, where the judge or a panel of judges is solely responsible for conducting legal enquiries. Lawyers play a more passive role — suggesting questions to the presiding judge and often following the judges' questioning of the evidence and witnesses with questions of their own.[68]

On the traditional role of the non-interventionist judge in the adversarial system, Lord Denning asserts that:

> In the system of trial which we have evolved in this country, the judge sits to hear and determine the issues raised by the parties, not to conduct an investigation or examination on behalf of society at large, as happens, we believe, in some foreign countries. Even in England, however, a judge is not a mere umpire to answer the question "How's that?" His object, above all is to find out the truth, and to do justice according to law; and in the daily pursuit of it the advocate plays an honourable and necessary role.[69]

Although Lord Denning saw the judge's role as 'finding out the truth', the High Court of Australia in *Whitehorn v The Queen* stated:

> A trial does not involve the pursuit of truth by any means. The adversary system is the means adopted and the judge's role in that system is to hold the balance between the contending parties without himself taking part in their disputations. It is not an inquisitorial role in which he seeks to remedy the deficiencies in the case on either side. When a party's case is deficient, the ordinary

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[67] Australian Law Reform Commission (ALRC), *Review of Adversarial System of Litigation*, Issues Paper No 25, <https://www.alrc.gov.au/sites/default/files/pdfs/publications/DP62.pdf> 27 [2.25].

[68] For a comprehensive discussion of the role defense lawyers play in evaluating forensic DNA evidence in both the Swiss and American context, see Vuille, Joelle and W. C. Thompson, 'An American Advantage? How American and Swiss Criminal Defense Attorneys Evaluate Forensic DNA Evidence' (2016) 14 *International Commentary on Evidence* 142

[69] *Jones v National Coal Board* [1957] 2 QB 55, 63 (Denning L).

> consequence is that it does not succeed. If a prosecution does succeed at trial when it ought not to and there is a miscarriage of justice as a result, that is a matter to be corrected on appeal. It is no part of the function of the trial judge to prevent it by donning the mantle of prosecution or defence counsel.[70]

Lawyers play a pivotal role in adversarial criminal proceedings and while lawyers for both the defence and the prosecution owe their primary duty to the administration of justice, their respective roles thereafter differ slightly. Defence counsel must represent the interests of their clients to the best of their ability. Prosecution counsel, in contrast, must act as so-called 'ministers of justice' and be advocates for the truth. Lawyers have the onerous tasks of, on the one hand, adducing sufficient evidence to establish the case they allege to the requisite standard and, on the other, of challenging the cogency and sufficiency of opponents' evidence to undermine their case.[71] Reinhardt and de Fina argue that the lack of training in anything other than a traditional adversarial, court-based system of law encourages a 'mindset or culture amongst practitioners' that is not focusing solely on justice.[72] The adversarial system can create conventions and tensions that sit in opposition to the need for lawyers to gain information from expert sources and to communicate with experts. These are discussed in detail in Chapter 5.[73]

3.4 The human rights framework

The adversarial system can only conform to fair trial principles if the opposing adversaries are equally matched. This is problematic because one of the contestants, the prosecution, is funded and armed by the State. Therefore, prosecution counsel is likely, in most cases, to have a superior armoury of proof at their disposal when compared to that of the defence. This problem achieves recognition in fair trial principles relating to equality of arms and the role and duties of the prosecutor in criminal proceedings, which seek to ameliorate defendants' unequal position.

It is necessary to consider the human rights framework of criminal trials in this research because fair trial and equality before the law principles underpin both the investigative and adjudicative stages of the criminal justice system. Clearly, therefore, these rights must frame investigative, forensic and legal approaches to how DNA evidence is, and should be, dealt with. It is beyond the scope of the thesis to

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[70] *R v Whitehorn* (1983) 49 ALR 448, 467, cited with approval by the Full Bench of the High Court in *R v Apostelides* (1984) 53 ALR 445.

[71] Bottomley and Bronitt, above n 65, 119.

[72] G Reinhart and Y de Fina cited in Chapter 4 of Charles Sampford, Sophie Blencowe, Suzanne Condlln (eds), *Educating Lawyers for a Less Adversarial System* (Federation Press, 1999) 48.

[73] See discussion at 5.7 and 5.8 specifically.

consider fair trial principles in detail. The purpose of the discussion here is to indicate the significance of those principles for the way that lawyers manage DNA evidence in criminal trials.

The two human rights of most relevance to the subject matter of this research are the right to a fair trial and the right to equality before the law. The right to a fair trial is a fundamental human right established at common law and in international and Australian human rights instruments. Although the common law recognises the right to a fair trial, it has never defined the elements of fair trials, whereas human rights instruments[74] list the minimum requirements for a fair trial. In 1923 Isaac J referred to this right at common law as the 'elementary right of every accused person to a fair and impartial' hearing[75] and Deane J in *Dietrich v The Queen* [76] echoed these sentiments in the High Court in 1992, reiterating that 'Isaacs J.'s statement that the requirement that the trial of an accused person be "fair and impartial" is "deeply rooted in our system of law" was not the stuff of empty rhetoric. It remains an accurate statement of the common law of this country.' Reference to this 'right' in the common law is often made with a focus on what is *not* acceptable, whereas human rights instruments tend to outline what *must* be done for an accused person to receive a fair trial. Mason CJ and McHugh J articulate the former approach in *Dietrich v The Queen*[77] — 'the accused's right to a fair trial is more accurately expressed in negative terms as a right not to be tried unfairly.' In contrast, human rights instruments[78] list the minimum requirements for fair trials — a more prescriptive approach that a defendant may refer to as determinative of fair trial principles.[79]

The right to a fair trial consists of a bundle of rights including that all persons are equal before courts and tribunals; the right to a fair and public hearing before a competent, independent and impartial court or tribunal established by law; the presumption of innocence and minimum guarantees in criminal proceedings, such as the right to counsel and not to be compelled to self-incriminate.[80]

Additionally, the right to equality before the law in the context of criminal trials may operate concomitantly with the right to a fair trial and buttress and provide content to a number of the elements of the right to a fair trial. So, for example, the fair trial right to have adequate time and

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74 *International Covenant on Civil and Political Rights*, opened for signature 16 December 1966, 999 UNTS 171 (entered into force 23 March 1976) art 14 ('*ICCPR*'); *Human Rights Act 2004* (ACT), *Charter of Human Rights and Responsibilities Act 2006* (Vic).

75 *R v MacFarlane; Ex parte O'Flanaghan and O'Kelly* (1923) 32 CLR 518, 541–542.

76 *Dietrich v The Queen* (1992) 177 CLR 292, 326.

77 Ibid [8].

78 The two Australian states with this legislation are currently Victoria and the ACT: see *Human Rights Act 2004* (ACT) and the *Charter of Human Rights and Responsibilities Act 2006* (Vic).

79 Jeremy Gans et al, *Criminal Process and Human Rights* (Federation Press, 2011).

80 See *ICCPR* art 14.

facilities to prepare a defence[81] is supplemented by equality of arms principles, including the right to disclosure, derived largely from the right to equality before the law.[82]

When lawyers present prosecution and defence cases in criminal matters involving DNA evidence, they must ensure that an accused receives a fair trial. How they conduct trials and handle evidence in each matter is then relevant to whether an accused receives a fair trial in terms of both the common law and relevant human rights instruments. Lawyers' management and use of any form of evidence, including DNA evidence, may arguably influence their ability to ensure a fair trial has been achieved.

This research explores whether a lawyer's level of knowledge or understanding of DNA evidence, influences the risk of an unfair trial for a defendant. Accordingly, the broader concept of a 'fair trial' as established by the common law and human rights instruments is explored and the role of counsel in achieving this goal is considered. It is not intended here to provide a comprehensive analysis of the right to a fair trial but rather to explore those aspects of the right to a fair trial and the right to equality before the law that are of relevance to the research questions explored in this research.

Although the fair trial principle is claimed to be fundamental and universal — a basic human right protected by international law — its scope and effect are legally limited in several ways.[83] This is explored further in sections [3.4.1]–[3.4.4].

3.4.1 Human Rights Instruments

Under the Australian legal system, international human right treaties have no *direct* application or legal effect until they are incorporated into domestic legislation.[84] Although domestic incorporation of the *ICCPR* in its entirety is yet to occur in all Australian jurisdictions, the ACT has enacted the *Human Rights Act 2004* (ACT) and Victoria has enacted the *Charter of Human Rights and Responsibilities Act 2006* (Vic), which are both based on the *ICCPR*. For other Australian jurisdictions, the *ICCPR* is the starting point for universally articulated human rights outside the common law. Even though not incorporated in their entirety in other Australian jurisdictions, international human rights principles cannot be ignored because various statutory and common law interpretive principles require

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[81] Ibid art 14(3)(b); *Victorian Charter of Human Rights and Responsibilities Act 2006* (Vic) s 25(2)(b); *Human Rights Act 2004* (ACT) s 22(2)(b).

[82] See *Charter of Human Rights and Responsibilities Act 2006* (Vic) s 8; *Human Rights Act 2004* (ACT) s 8.

[83] Simon Bronitt and Bernadette McSherry, *Principles of Criminal Law* (Lawbook, 3rd ed, 2010) 116.

[84] Anthony Mason, 'The Role of the Judiciary in the Development of Human Rights in Australian Law' in D Kinley (ed), *Human Rights in Australian Law* (Federation Press, 1998).

reference to international human rights norms.[85] Both the *Human Rights Act 2004* (ACT) and the *Charter of Human Rights and Responsibilities Act 2006* (Vic) cover criminal proceedings and include the right to a fair hearing[86] and the right to equality before the law.[87] The model represented by this legislation places courts under a duty to interpret legislative provisions so far as it is possible to do so consistently with their purpose in a way that is compatible with human rights[88] and if this is not possible, the court must make a declaration of incompatibility or inconsistent interpretation.[89]

3.4.2 Case law

Although the notion of a fair trial is covered by the *ICCPR* and now the *Human Rights Act 2004* (ACT) and *Charter of Human Rights and Responsibilities Act 2006* (Vic), Refshauge J highlights that case law references the elementary right of every accused person to a fair and impartial trial as far back as 1923.[90] International human rights jurisprudence tells us that the right to a fair trial extends beyond the trial itself. For example, the European Court of Human Rights in *Teixeira de Castro v Portugal*[91] found that evidence obtained by deliberate police entrapment violated the right to a fair trial under the *European Convention on Human Rights* art 6. The court affirmed that the guarantee of fairness is not limited to legal proceedings, but underpins the whole criminal justice process — including the investigative and evidence gathering processes.[92] This mirrors the approach adopted by the High Court in *Jago v District Court*[93] (in relation to delay). *Jago* considered whether a miscarriage of justice had occurred because of undue delay before a trial.[94] The case demonstrates that although it is not the court's responsibility to ensure fairness in criminal investigations, any unfairness (for example delay) in that aspect of the criminal justice process may be relevant to whether the court can ensure the

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85 Note the principle of legality, the principle of consistency and the legitimate influence principle as discussed in Gans et al, above n 9, 24–35.

86 Sections 21 and 22 of the *Human Rights Act 2004* (ACT); Sections 24 and 25 *Charter of Human Rights and Responsibilities Act 2006* (Vic). Based on art 14(3) of the *ICCPR*.

87 *Victorian Charter of Human Rights and Responsibilities Act 2006* (Vic) s 8; *Human Rights Act 2004* (ACT) s 8.

88 *Human Rights Act 2004* (ACT) s 30; *Victorian Charter of Human Rights and Responsibilities Act 2006* (Vic) s 32.

89 *Human Rights Act 2004* (ACT) s 32–34; *Victorian Charter of Human Rights and Responsibilities Act 2006* (Vic) s 28.

90 *R v Macfarlane; Ex parte O'Flanagan* (1923) 23 CLR 518.

91 *Teixeira de Castro v Portugal* [1998] IV Eur Court HR 1451.

92 Ibid 34, citing *Van Mechlen v the Netherlands* (23 April 1997), Reports of Judgments and Decisions 1997-III, 711, s 50. This could potentially influence Australian law — see Simon Bronnitt, 'The Law in Undercover Policing: A Comparative Study of Entrapment and Covert Interviewing in Australia, Canada and Europe' (2004) 33(1) *Common Law World Review* 35.

93 *Jago v District Court* (NSW) (1989) 168 CLR 23.

94 Ibid.

accused receives a fair trial. For this reason, Mason CJ in *Jago* envisioned the right to a fair trial as extending to the whole course of the criminal process.[95]

This conception of the fair trial is clearly relevant beyond the precise matters in issue in those cases and extends to the capture and analysis of DNA evidence. Furthermore, it is clear from human rights instruments themselves that the right to a fair trial extends to both pre- and post-trial processes. This is because of a number of the ancillary rights listed in human rights instruments as guarantors of the fair trial relate to pre- and post-trial matters, such as the pre-trial right to adequate time and facilities to prepare a defence[96] and the post-trial right to review/appeal.[97]

3.4.3 Legal representation

The operation of the fair trial principle may depend on the nature and seriousness of the offence. In *Dietrich v The Queen*[98] the High Court acknowledged that the concept of a fair trial is an evolving one, incapable of exhaustive definition.[99] So, for example, what is considered fair, Gaudron J observed, may depend on the circumstances of a case and the prevailing social values at the time a case is heard. What may be fair in one case may be unfair in another.[100] In *Dietrich* it was held that lack of legal representation for accused persons when charged with serious offences may cause trials to be unfair.

The right to a fair trial imposes duties and responsibilities on counsel to know and understand the law and the evidence relevant to the cases in which they act.[101]

The competence of lawyers by standards set by the profession has implications for the right to legal representation.[102] If the right is that legal representation must be competent, even at the very

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95 Ibid 29.

96 *ICCPR* art 14 (3)(b); *Victorian Charter of Human Rights and Responsibilities Act 2006* (Vic) s 25(2)(b); *Human Rights Act 2004* (ACT) s 22(2)(b).

97 *ICCPR* art 14(4); *Victorian Charter of Human Rights and Responsibilities Act 2006* (Vic) s 25(4); *Human Rights Act 2004* (ACT) s 22(4).

98 *Dietrich v The Queen* (1992) 11 CLR 292.

99 Ibid 300, 353.

100 Ibid 364.

101 All lawyers have an obligation to be competent — see provisions around professional conduct and misconduct in the *Legal Profession Act 2004* (Vic) s 4.4.2; *Legal Profession Act 2006* (ACT) s 387, whereby if a lawyer does not maintain an acceptable level of competence and diligence, they may be treated under provisions of 'professional misconduct.'

102 This issue was addressed in *Cummings v The Queen* (1994) 12 SR (WA) 172, 178. See also *Fuller* (1994) 12 SR (WA) 182, 188 and *Dietrich v The Queen* (1992) 177 CLR 292, 353 (Toohey J): 'I assume, of course, that representation is competent.' See also *Dietrich v The Queen* (1992) 177 CLR 292, 345 (Dawson J), 310 (Mason CJ and McHugh J). But see Barlow J in *Cummings v The Queen* (1994) 12 SR (WA) 172, 178 that 'to avoid an unfair trial the applicant's legal representation need only be reasonable, it need not be "Rolls Royce"' and

minimum of standards, this should mean that if lawyers are presented with a case where there is DNA evidence beyond their level of understanding then they should decline to take the case. Arguably, taking the case would mean that the client could not be ensured of receiving a 'fair trial.'

3.4.4 Prosecutorial duties arising from the right to a fair trial

Although courts cannot always remedy the denial of human rights occurring outside the judicial system, they cannot tolerate it within that system.[103] Those charged with criminal offences, faced with DNA evidence in the case against them must be assured of this protection. The prosecutor also has a special role to play in protecting accused persons' human rights.

This responsibility is reflected in the entire conception of the modern prosecutor and consequent duties imposed on prosecutors. For example, former DPP and current ACT Supreme Court judge Richard Refshauge SC has stated that the prosecutor has a duty not only to prosecute persons charged with crimes but also to balance this duty by ensuring that prosecutions are not conducted at any cost. This means that DPPs must develop policies and guidelines to achieve the requisite fair balance.[104] Where DNA evidence is concerned, such guidelines will have particular relevance in cases where the only, or most significant, inculpatory evidence is DNA evidence or where the DNA evidence involves a new or emerging area of analysis.[105]

By seeking to ensure that the trial is not just a bare fisted knuckle fight where 'anything goes', the right to a fair trial effectively determines the nature of the prosecutor's role within the adversarial criminal trial. It assigns to the prosecutor the role of a 'Minister of Justice' and imposes certain consequent duties upon the prosecution.[106] One aim of these duties is to achieve equality of arms[107] between the prosecution and the defence. In this regard, perhaps the most important of these duties

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restrictive interpretation in *AG (NSW) v Milat* (1995) 37 NSWLR 370. A more recent case is that of *Cornelius Stevens v Emily Mccallum* [2006] ACTCA 13 (Higgins CJ, Crispin P and North J).

[103] *McInnis v The Queen* (1979) 143 CLR 575, 593 (Murphy J).

[104] Richard Refshauge, 'Victim's Rights and the Role of the Prosecutor' (Paper presented at International Society for Reform of Criminal Law Conference, Brisbane, July 2006) 19. Also seen by the High Court in *Mallard v The Queen* [2005] HCA 68, 82.

[105] See 5.5 for discussion on the decision to prosecute in cases where DNA is the only or the most significant part of the evidence brief.

[106] David Plater and Sangeetha Royan, 'The Development and Application in Nineteenth Century Australia of the Prosecutor's Role as a Minister of Justice: Rhetoric or Reality?' (2012) 31 *University of Tasmania Law Review* 78; David Plater, 'The Development of the Prosecutor's Role in England and Australia with Respect to its Duty of Disclosure: Partisan Advocate or Minister of Justice?' (2008) 25 *University of Tasmania Law Review* 111; David Plater, 'The Development of the Role of the Prosecuting Lawyer in the Criminal Process: "Partisan Persecutor" or "Minister of Justice"?' [2006] *Australia and New Zealand Law and History E-Journal* 1.

[107] *Victorian Charter of Human Rights and Responsibilities Act 2006* (Vic) s 8; *Human Rights Act 2004* (ACT) s 8.

(and for this research) is the duty of disclosure.[108] The right to a fair trial imports the equality of arms principle into criminal trials and provides the basis of the prosecutors' duty to disclose certain information to the defence.

The equality of arms principle is founded on the inherent and unbalanced allocation of resources between an accused and the State. In many cases this may create an unequal playing field regarding forensic experts and DNA reports because the prosecution has access to State forensic laboratories.

In the Australian adversarial system where the provision of forensic science for solving crime is provided almost exclusively by the State (unlike the private system in the United Kingdom),[109] the courts cannot take sole responsibility for addressing the resource implications of the fair trial principle — like those created by the availability and allocation of resources involved in acquiring and presenting DNA evidence. This makes the designated role of the prosecutor and the duty of disclosure crucial elements in achieving fair trials in this regard.

A prosecutor must act as a 'Minister of Justice' and must not embrace notions of 'winning' or 'losing.'[110] This means that although prosecutors have at their disposal the resources of the State as State government agencies, this is balanced somewhat by their onerous duty of disclosure.[111] The

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[108] See for example, *Prosecution Policy of the Australian Capital Territory*, Office of the Director of Public Prosecutions (ACT), 12 <http://www.dpp.act.gov.au/__data/assets/pdf_file/0006/715506/PROSECUTION-POLICY-OF-THE-AUSTRALIAN-CAPITAL-TERRITORY.pdf>:

> Disclosure 4.1: The prosecution is under a continuing obligation to make full disclosure to the accused in a timely manner of all material known to the prosecution which can be seen on a sensible appraisal by the prosecution:
>
> - to be relevant or possibly relevant to an issue in the case;
> - to raise or possibly raise a new issue whose existence is not apparent from the evidence the prosecution proposes to use; or
> - to hold out a real as opposed to fanciful prospect of providing a lead to evidence which goes to either of the previous two matters.
>
> 4.2: The prosecution is also under a duty to disclose to the defence information in its possession which is relevant to the credibility or reliability of a prosecution witness, for example:
>
> - a relevant previous conviction or finding of guilt;
> - a statement made by a witness which is inconsistent with any prior statement of the witness;
> - a relevant adverse finding in other criminal proceedings or in non-criminal proceedings;
> - evidence before a court, tribunal or Royal Commission which reflects adversely on the witness;
> - any physical or mental condition which may affect reliability;
> - any concession which has been granted to the witness in order to secure the witness's testimony for the prosecution.

[109] Since the closure of the FSS (UK).

[110] See for example Plater and Royan, above n 106.

[111] In the ACT this legislation is governed by a number of statutes, including the *Legal Profession (Solicitors) Rules 2008* (ACT) r 23.5-23.7. In Victoria, it may be found in the *Victorian Bar Inc Practice Rules* 2009 Rules 141-142.

obligation of disclosure is only one aspect of the prosecutor's broader obligation of a 'Minister of Justice.'[112] Rand J in the Canadian case of *Boucher v The Queen*[113] aptly describes the role of the prosecutor as being:

> not to obtain a conviction, it is to lay before a jury what the Crown considers to be credible evidence relevant to what is alleged to be a crime. Counsel have a duty to see that all available legal proof of the facts is presented: it should be done firmly and pressed to its legitimate strength but it must also be done fairly. The role of prosecutor excludes any notion of winning or losing; his function is a matter of public duty than which in civil life there can be none charged with greater personal responsibility. It is to be efficiently performed with an ingrained sense of the dignity, the seriousness and the justness of judicial proceedings.[114]

In fulfilling their duty to ensure that a trial is fair,[115] the prosecution must disclose to the defence pre-trial any material pointing to the innocence or guilt of the accused. This includes DNA evidence that either excludes or fails to exclude a defendant in matching a DNA sample to a crime scene or victim. The case of *R v Drummond (No 2)*[116] demonstrates the importance of defence counsel being notified in a timely manner about the DNA evidence that the prosecution counsel will adduce. In this case, it was a point that was entirely germane to the conduct of the defence case as the DNA evidence in question had been mentioned in reports but defence counsel did not believe it would be adduced by the prosecution nor did they realise the significance of the evidence for this case.[117]

Examples of the duty to disclose may be found in several statutes, rules of procedure and prosecutorial policy in Australian jurisdictions. Some examples include the *Australian Capital Territory Barristers' Rules*,[118] the *Victorian Bar Incorporated Practice Rules*[119] and the *Crimes (Criminal Trials) Act 1999* (Vic).[120] These provisions mirror the UK's Crown Prosecutor's Disclosure Manual.[121] Also of relevance

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[112] See further discussion of the role of the prosecutor as a minister for justice in David Plater and Lucy De Vreeze, 'Is the Golden Rule of Full Prosecution Disclosure a Modern Mission Impossible?' (2012) 14 *Flinders Law Journal* 133.

[113] *Boucher v The Queen* (1955) SCR 16.

[114] Ibid 24.

[115] *Mallard v The Queen* [2005] 224 CLR 125, 155.

[116] *R v Drummond (No 2)* [2015] SASCFC 82.

[117] Though in this case the evidence in question was mentioned in forensic reports and counsel did not realise it would be adduced, nor the significance of the evidence if it were produced in court.

[118] See rr 66–72.

[119] See rr 141–142.

[120] See ss 6–7.

[121] Keir Starmer and Jim Barker-McCardle, *Disclosure Manual,* Crown Prosecutors Service, <http://www.cps.gov.uk/legal/d_to_g/disclosure_manual/disclosure_manual_foreword/>.

to the present study is the Prosecution Policy of the Australian Capital Territory[122] and the DPP Prosecutions Policy, 'Disclosure' in Victoria.[123] The prosecution duty of disclosure at common law is also extensive.[124]

The *Crimes (Criminal Trials) Act 1999* (Vic), introduced several disclosure requirements for both prosecution and defence. The prosecutor must provide the defence with a summary of its opening and notice of pre-trial admissions 28 days before the trial date.[125] The defence must, within 14 days of the trial date, file a response to the prosecution opening. This response must 'identify the acts, facts, matters and circumstances with which issue is taken and the basis on which issues is taken.'[126] This displaces the common law defence right to remain silent in relation to the nature of its case. The rationales for imposing disclosure obligations on the defence relate primarily to case management and efficiency considerations.[127] The most common criticisms of these provisions are that they may result in an accused being compelled to facilitate his or her own conviction and that they displace the accused's right to silence.[128] Flatman and Bagaric contend however, that these provisions do not require an accused to disclose any more than was previously the case; they simply 'hasten' disclosure.[129] Also defending the defence disclosure provisions, Refshauge J argues that if they help to ensure that genuine issues in a trial are litigated, and that only genuine issues are litigated, then there

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[122] This Policy was created after the formation of the *Director of Public Prosecutions Act 1990* (Vic). Office of the Director of Public Prosecutions (ACT), above n 8, 12 (see quoted text).

[123] Director of Public Prosecutions (Vic), *Director's Policy: Disclosure* (24 November 2014) Office of Public Prosecutions Victoria, <http://www.opp.vic.gov.au/getattachment/bf6aca19-dbf7-4044-a4f7-be7b835cc2c7/5Disclosure.aspx>:

PART 3 – Summary

3. Subject to any claim of public interest immunity or legal professional privilege, or any statutory provisions to the contrary, the prosecution must fulfil its disclosure obligations under the *Criminal Procedure Act 2009* and disclose to the accused any other material which:
   (a) is relevant or possibly relevant to an issue in the case; or
   (b) raises or possibly raises a new issue whose existence is not apparent from the evidence the prosecution proposes to use; or
   (c) holds out a real as opposed to fanciful prospect of providing a lead to evidence which goes to (a) or (b) above.
4. When in doubt about whether material should be disclosed, the matter should be discussed with a Crown Prosecutor or the DPP.

[124] See, for example, *R v Stinchcombe* (1991) 68 CC (3d) 1; *R v Ward* [1993] 1 WLR 619; *R v Keane* [1994] 2 All ER 478; *R v Gray* (2001) 184 ALR 593 and *R v Mallard* (2005) 224 CLR 125.

[125] *Crimes (Criminal Trials) Act 1999* (Vic) s 6(1)(a).

[126] Ibid s 7(2).

[127] Geoff Flatman and Mirko Bagaric, 'Accused Disclosure – Measured Response or Abrogation of the Presumption of Innocence?' (1999) 23 *Criminal Law Journal* 327, 328.

[128] Geoff Flatman and Mirko Bagaric, 'Accused Disclosure – Measured Response or Abrogation of the Presumption of Innocence?' (1999) 23 *Criminal Law Journal* 327.

[129] Ibid 330.

is no doubt that they will reduce trial times and increase certainty for those involved in the criminal process.[130]

The prosecution duty of disclosure is extensive, because in the past, failures of disclosure have led to miscarriages of justice. In *Mallard v The Queen*,[131] a principal authority on the matter, the High Court discussed the scope of this duty.[132] This case also considered the role and responsibility of police in ensuring that the evidence given to the DPP is accurate and that no evidence has been withheld. One of the successful arguments in the High Court appeal was that the prosecution failed to disclose to the defence at the trial material which was relevant or potentially relevant to issues in the case, or which raised or possibly raised new issues not otherwise apparent, or which could have led to such matters being discovered.[133]

The difficulty for the DPP was that they were reliant on the police to handle the investigation and consequently hand over a brief of evidence that was representative of what was found during the investigation. Evidence that was contrary to the defendant's apparent 'confession' and did not place him near the crime scene was omitted from police statements and reports. This would have prevented the prosecution from presenting a fair and impartial case from the outset of the trial. In the second 'appeal' in this case to the West Australian Court of Criminal Appeal, the prosecution conceded that, in several respects, material evidence should have been disclosed to the defence at trial but had instead been withheld.[134] This concession arguably established the existence of an unreasonable or unsustainable verdict. Kirby J found that a miscarriage of justice had occurred in *Mallard*, because of the culmination, variety, number and importance of material evidence that was not disclosed or that was suppressed during the investigation and initial trial.[135]

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[130] Richard Refshauge QC, 'Creating a Criminal Justice System for the 21st Century' (2000) 9 *Journal of Judicial Administration* 185, 191.

[131] *Mallard v The Queen* (2005) 224 CLR 125.

[132] This was also considered in detail in *Lawless v The Queen* (1979) 142 CLR 659, where the majority found that 'fresh evidence' relied upon would not have been likely to have led to a different result in a new trial. Murphy J dissented in that case. This was because the trial judge had directed the prosecution to hand over copies of all statements by all witnesses to the applicant and this was not done with a statement that Murphy J believed could have been useful to the applicant. This, his Honour believed meant that the applicant suffered a miscarriage of justice on the ground of the suppression of the evidence in and of itself (at 683). See also *R v Apostilides* (1984) 154 CLR 563 where the High Court affirmed the responsibility borne by a prosecutor in the conduct of a criminal trial.

[133] *Mallard v The Queen* (2005) 224 CLR 125, 126.

[134] *Mallard v The Queen* (2003) 28 WAR 1, 25, 29, 32.

[135] *Mallard v The Queen* (2005) 224 CLR 125, 145.

Although it is difficult to define exhaustively the material that must be disclosed by the prosecution to the defence and to the court, the list would certainly include several obligations. These are:

- To provide statements of witnesses proposed to be called;
- To provide notice of discrepancies between a statement and the evidence proposed to be led;
- To provide statements of witnesses not proposed to be called;
- To provide prior convictions of prosecution witnesses and other material relevant to credit;
- To provide other material which could reasonably assist the defence case; and
- To provide all material relevant to mitigation of sentence.

In relation to DNA evidence, the duty of disclosure clearly requires all expert reports to be provided to the defence. If a prosecutor is given a forensic biology report on DNA evidence and that report excludes or does not exclude the accused, this information is likely to fall under the category of information that must be presented to the defence. The English Court of Appeal case *R v Maguire*[136] held that in the forensic context, a forensic scientist who is an expert for the prosecution is under a duty to disclose material which he or she is aware may have some bearing on the offence alleged, or the more general circumstances of the case:

> The disclosure will be to the authority which retains him and which must in turn (subject to sensitivity) disclose the information to the defence. We hold that there is such a duty because we can see no cause to distinguish between members of the prosecuting authority and those advising it in the capacity of a forensic scientist. Such a distinction could involve difficult and contested inquiries as to where knowledge stopped but, most importantly, would be entirely counter to the desirability of ameliorating the disparity of resources as between the Crown and the subject.[137]

Beyond the provision of a DNA profile and the statistical evaluation of a match between a sample and a random member of the population however, is the importance of providing further information, as demonstrated by the case of *Jama*. This arguably includes information beyond the forensic report and could extend to the forensic file compiled during the investigative phase by police officers and by forensic biologists collecting, testing, analysing and presenting DNA evidence in criminal trials. The duty of disclosure may even extend to enabling the defence to have access to prosecution experts who wrote the reports and compiled the evidence to facilitate their understanding of the contents of the reports and their implications. The extent of the prosecution duty of disclosure vis à vis DNA

[136] *R v Maguire* [1992] 2 WLR 767 (QB).

[137] Ibid 958.

evidence is yet to be tested and/or fully defined. This means that current professional practices derived from the adversarial criminal justice culture are likely to fill this void not necessarily to the advantage of the defence or in ways that advance the defence ability to understand or challenge DNA evidence either in general or in particular cases.

In any event, the duty of disclosure must be adhered to in a timely manner. If information is presented only shortly before trial, the defence team has a much more limited ability to understand and challenge that evidence. If the prosecutor fails to fulfil these duties, then a fundamental tenet of the adversarial system, and indeed the right to a fair trial, are undermined and the consequences, as in *Mallard*, may be a miscarriage of justice.

3.5 Expert evidence and the opinion rule

> Your Honour, I swore to tell the truth, the whole truth and nothing but the truth, but every time I try that barrister over there complains.[138]

Both Victoria[139] and the ACT[140] have enacted the uniform evidence legislation.[141] This legislation governs the admissibility of expert opinion in both Victoria and the ACT and overrides any previously applied common law rules. Accordingly, the common law rules were not considered in this research.

3.5.1 The opinion rule

An opinion is 'an inference drawn from observed and communicable data.'[142] When it comes to opinions about facts relevant to legal proceedings, ultimately the only determinative opinion is that of the fact-finder — the judge (when the judge has jurisdiction over both the law and the facts) or the jury. Generally, witnesses may only testify about facts. Their opinions about facts in issue or facts relevant to facts in issue are regarded as irrelevant. Gans and Palmer argue that by allowing witnesses to express opinions about relevant facts, the court duplicates the role of the fact-finder in assessing

[138] Peter Goldsmith, *John Bolton Memorial Lecture: The Role of Expert Evidence and its Regulation*, Academy of Expert Witnesses, quoted in Networked Knowledge, *Experts* (25 January 2007) <http://netk.net.au/Experts/Expert1.asp>.

[139] *Evidence Act 2008* (Vic).

[140] *Evidence Act 2011* (ACT).

[141] Those Acts included in the uniform evidence schedule are the following: *Evidence Act 1995* (Cth); *Evidence Act 2004* (Norfolk Island); *Evidence Act 1995* (NSW); *Evidence (National Uniform Legislation) Act 2011* (NT); *Evidence Act 2001* (Tas); *Evidence Act 2008* (Vic). *The Evidence Act 1995* (Cth) applies in the ACT.

[142] *Allstate Life Insurance Co v Australasia & New Zealand Banking Group (No 32)* (1996) 136 ALR 627, 629 (Lindgren J).

the evidence and facts.[143] If you were to allow this duplication, there is the potential for trials to be longer. Additionally, there is a risk that the fact-finder will abrogate his or her role to an opinion-holder by deferring unduly to the opinion-holder's assessment of the facts. Examples of this might be jurors giving weight to some witnesses' opinions for extraneous and inappropriate reasons such as their authority as in the case of police officers.[144]

Nevertheless, on occasion the opinions of some people may have evidentiary value and be justifiably influential, particularly if those people have knowledge that is beyond the knowledge of the fact finder, or if their views could legitimately 'carry weight with the fact-finder.'[145]

To help differentiate relevant from irrelevant opinion evidence, and to guard against the admission of the latter whilst permitting the admission of the former, the uniform evidence legislation contains a raft of rules relating to opinion evidence. They begin with a general exclusionary rule whose operation is curtailed by several exceptions to that rule, the most relevant for this research being the exception for expert opinion evidence. The general exclusionary rule is set down in s 76 of the uniform evidence legislation: 'Evidence of an opinion is not admissible to prove the existence of a fact about the existence of which the opinion was expressed.'

3.5.2 Exceptions to the opinion rule

As noted above, there is an exception to the opinion rule for opinions based on specialist knowledge. This is because the judge and/or jury often require expert information to make informed decisions on what evidence or relevant facts might mean. In that sense, not all opinions are equal and if a person has 'specialised' knowledge in an area, their opinions may assist the fact-finder in making more informed decisions about the case. Judges and especially jurors are selected on the basis that they are impartial and unbiased observers, able to make decisions using common sense and general knowledge. Courts appreciate the assistance of experts in areas that require more than common sense and general knowledge:

> If matters arise in our laws which concern other sciences and faculties we commonly call for the aid of that science or faculty which it concerns, which is an honourable and commendable thing for thereby it appears that we do not despite all other sciences but our own, but we approve of them and encourage them.[146]

[143] Jeremy Gans and Andrew Palmer, *Uniform Evidence* (Oxford University Press, 2nd ed, 2014).

[144] *Smith v The Queen* (2001) 206 CLR 650, [9] (Gleeson CJ, Gaudron, Gummow and Hayne JJ).

[145] Gans and Palmer, above n 3.

[146] *Buckley v Rice Thomas* (1554) 75 ER 182, 191 cited in Gans and Palmer, above n 3, 138.

The exception of most relevance to lawyers in relation to DNA evidence is contained in s 79 of the uniform evidence legislation, which reads:

> If a person has specialised knowledge based on the person's training, study or experience, the opinion rule does not apply to evidence of an opinion of that person that is wholly or substantially based on that knowledge.

The terms of this provision are particularly broad. The NSW Court of Appeal in *Adler v ASIC*[147] stressed that 'specialised knowledge' is 'not restrictive; its scope is informed by the available bases of training, study or experience.'[148]

Gans and Palmer distinguish 'specialised knowledge' from skills, belief and exposure.[149] A person does not have specialised knowledge if he or she is simply good at drawing factual inferences but does not have knowledge beyond that of the fact-finder. To qualify as an expert under s 79, a person cannot simply have feelings or beliefs about the world — he or she must have knowledge because of observation and reasoning.[150] Finally, it is not enough, as was held in *Idaport Pty Ltd v National Australia Bank Ltd*[151] that someone has passively acquired knowledge in an area, he or she must have actively engaged in the topic to satisfy the 'specialised knowledge' exception.

In *Honeysett v The Queen*[152] a professor of anatomy gave evidence in an armed robbery case that there were similarities between an accused person and closed circuit television video footage of the perpetrator entering a hotel and committing the robbery. It was held in this case that the opinion of the witness, Professor Henneberg, was based on visually comparing images, rather than anthropometric measurement or statistical analysis. The opinion was not found to be based on his knowledge of anatomy, nor wholly or substantially based on his specialised knowledge within s 79(1). The area of 'body mapping' gave an 'unwarranted appearance of science to the prosecution case that the appellant and another offender in the robbery shared a number of physical characteristics.'[153] Accordingly, the court held that the evidence should not have been admitted and ordered that the conviction be set aside and a new trial ordered.[154]

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147 *Adler v ASIC* [2003] NSWCA 131.

148 Ibid [629].

149 Gans and Palmer, above n 3.

150 *R v Tang* [2006] NSWCCA 167.

151 *Idaport Pty Ltd v National Australia Bank Ltd* [2001] NSWSC 123, 153.

152 *Honeysett v The Queen* [2014] HCA 29, 14.

153 Ibid 32.

154 Ibid 49.

Similarly, in the case of *R v Tang*[155] the appellant had been 'identified' by an expert as being a person involved in a robbery, based on facial recognition and mapping processes. The appellant argued that the person giving the evidence of facial recognition was not an expert as she did not have 'specialised knowledge' and therefore her opinions could not satisfy the s 79 exception to the opinion rule. The NSW Court of Criminal Appeal approved a definition of 'knowledge' from the US case *Daubert v Merrell Dow Pharmaceuticals Inc*[156] as the following:

> the word 'knowledge' connotes more than subjective belief or unsupported speculation. The term applies to any body of known facts or to any body of ideas inferred from such facts or accepted as truths on good grounds.[157]

The requirement that the opinion must be 'wholly or substantially based' on an expert's specialised knowledge prevents experts from making statements that are not based on their area of expertise and then having the court place authority on them. This issue was raised in *HG v The Queen*[158] by Gleeson CJ:

> Experts who venture 'opinions' (sometimes merely their own inference of fact), outside their field of specialised knowledge may invest those opinions with a *spurious appearance of authority* [emphasis added], and legitimate processes of fact-finding may be subverted.[159]

To avoid this situation, paragraph 1.3 of the Expert Code of Conduct contained in the *Court Procedure Rules 2006* (ACT)[160] specifies the form that expert reports should take. The body of the report, or an annexure to that report should state the following:

(a) the expert's qualifications;

(b) all material facts and assumptions on which the report is based (a letter of instructions may be annexed);

(c) the reasons for each opinion expressed;

(d) if applicable, that a particular question or issue falls outside the expert's area of expertise;

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[155] *R v Tang* [2006] NSWCCA 167.

[156] *Daubert v Merrell Dow Pharmaceuticals Inc*, 509 US 579 (1993).

[157] *R v Tang* [2006] NSWCCA 167, [138] approving *Daubert v Merrell Dow Pharmaceuticals Inc,* 509 US 579, 590 (1993).

[158] *HG v The Queen* (1999) CLR 414.

[159] Ibid 416.

[160] *Court Procedure Rules 2006* (ACT), Expert Witness Code of Conduct, Schedule 1. See below for discussion in more detail.

(e) references to any literature or other materials relied on by the expert to support the expert's opinions;

(f) any examinations, tests or other investigations that the expert has relied on, and details of the qualifications of the person who carried them out.[161]

These requirements largely reproduce those set down for civil cases by *Makita (Australia) Pty Ltd v Sprowles.*[162]

For the purposes of this research, this would mean an expert presenting DNA evidence would state their forensic biology qualifications in every report produced for the court and outline all the assumptions or material facts relied on in the preparation of that report. Compliance with these and the remaining requirements may not necessarily expose flaws in DNA evidence, however, particularly if there have been flaws in the collection of the evidence as was the case in *Jama*.

Unlike other areas of evidence that are relatively new to the courts,[163] DNA evidence is a widely-accepted form of scientific expert evidence, and those giving DNA evidence usually fall within the scope of expert forensic biologists who have experience in testing, analysing and presenting the evidence in criminal trials. There is no harm in specifying the above information, however, presenting this information in forensic reports will not alone prevent miscarriages of justice.

Edmond has expressed concern about the courts' lack of emphasis on ascertaining whether experts have 'specialised knowledge' in the areas on which they give evidence, predominantly because of his concern with issues around the reliability of expert evidence.[164] He argues that the 'reluctance of lawyers and judges to engage with the validity and reliability of the techniques or the methods and bases' that opinions may be based on, may have serious implications for criminal proceedings.[165] Edmond et al published a 'guide for lawyers'[166] on how to cross-examine forensic experts on the

[161] Ibid Schedule 1.3.

[162] (2001) 52 NSWLR 705, [62]–[69], [84]–[87] (Heydon J).

[163] For example, body mapping, shoe imprints and facial recognition/facial mapping.

[164] Gary Edmond, 'The admissibility of forensic science and medicine evidence under the Uniform Evidence Law' (2014) 38 *Criminal Law Journal* 136; Gary Edmond, 'Impartiality, Efficiency or Reliability? A Critical Response to Expert Evidence Law and Procedure in Australia' (2010) 42(2) *Australian Journal of Forensic Sciences* 83; Also see Gary Edmond, 'Actual Innocents? Legal Limitations and their Implications for Forensic Science and Medicine' (2011) 43(2–3) *Australian Journal of Forensic Sciences* 177.

[165] Edmond, 'Impartiality, Efficiency or Reliability? A Critical Response to Expert Evidence Law and Procedure in Australia', above n 164, 88.

[166] Gary Edmond, Kristy Martire, Richard Kemp, David Hamer, Brynn Hibbert, Andrew Ligertwood, Glenn Porter, Mehera San Roque, Rachel Searston, Jason Tangen, Matthew Thompson and David White, 'How to cross-examine forensic scientists: A guide for lawyers' (2014) 39 *Australian Bar Review* 174.

validity and reliability of the various fields of 'forensic' evidence, focusing mostly on comparison evidence. This article is, however, useful for lawyers cross-examining forensic biologists on DNA evidence in court. The concern over challenging forensic evidence is also reflected in the 2009 report *Strengthening Forensic Science in the United States: A Path Forward* (NAS Report), which emphasises that lawyers do not sufficiently challenge the basis of an expert opinion — although DNA evidence is viewed as having moved past criticisms of 'junk science' and is seen as generally inherently reliable as a form of evidence.[167] Because DNA is an 'accepted' area of science, the evidence is more likely to be admitted without any exploration of its reliability.[168] The science of DNA however is expanding exponentially and there are new areas of research finding DNA in smaller samples, with greater magnification.[169] This makes it even more important that lawyers remain astute about new developments in this area and accept the responsibility of challenging DNA evidence through cross-examination if need be.[170] It is also particularly important that lawyers' competence extend to ensuring that only competent experts give evidence and that their evidence is within their areas of specialised knowledge.[171] It also means that lawyers must be alert to the possible flaws or limitations in the evidence that may be a source of unreliability, if they are to be able to expose them.[172]

3.5.3 Managing and communicating expert evidence

To ensure expert evidence is regulated in some form, the court relies in part on regulatory bodies that accredit experts. Part of the responsibility in this regard however, lies with the courts and court rules may govern an expert's duty to the court, enforce requirements of full disclosure, pre-trial conferences and govern what form expert reports must take.[173] Part of the responsibility for ensuring expert evidence is regulated in the courtroom also lies with legal practitioners, who elicit expert evidence in anticipation of relying on its results, or challenge expert evidence tendered by the opposing party. If that is the case, then lawyers must ensure that experts expose for court scrutiny,

[167] National Research Council Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) National Academy of Sciences https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf ('NAS Report').

[168] Edmond, 'Impartiality, Efficiency or Reliability? A Critical Response to Expert Evidence Law and Procedure in Australia', above n 4, 89.

[169] See discussion of mitochondrial and low copy DNA evidence at 3.2.2.

[170] See discussion in 5.8.2 and 6.4.1.

[171] See 3.4.2 for discussion of 'specialised knowledge'.

[172] See 5.5.1 for further discussion of the limitations of DNA evidence as identified by interviewees and focus group participants.

[173] See for example *Court Procedures Rules 2006* (ACT).

the factual basis for their decision-making — widely referred to in evidence law parlance as the 'basis – rule'.[174] Heydon JA explained this requirement as follows:

> the opinion of an expert requires demonstration or examination of the scientific or other intellectual basis of the conclusions reached: that is, the expert's evidence must explain how the field of "See" in which the witness is expert by reason of "training, study or experience", and on which the opinion is "wholly or substantially based", applies to the facts assumed or observed so as to produce the opinion propounded.[175]

Gans and Palmer point out, however, that this cannot be a general rule of admissibility because opinions derived from experience rather than study would never be able to satisfy that requirement.[176] Freckelton and Selby nevertheless note that most cases are argued by generalist lawyers and decided by the 'average man' on a jury. This places even more emphasis on experts to present information intelligibly and persuasively to laypeople and lawyers — otherwise 'expertise has no point.'[177] Lawyers should always be alert to the possibility that experts may express opinions that fall outside their area of expertise. They should also scrutinise, and, if necessary, challenge the connections between the basis for an opinion and the opinion offered.

As a result of commissions of enquiry into the Splatt, Chamberlain and Thomas convictions, counsel should be aware of problems that arise in the chain of custody of evidence and poor scientific method.[178] This is even more important given the conclusions and recommendations in the *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (Vincent Report).[179] Edmond argues that the reports imply that lawyers and judges have not appreciated the magnitude or prevalence of the issues that arise when forensic evidence is introduced in criminal trials and so have been 'correspondingly ineffective in their practice.'[180]

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[174] Miiko Kumar, 'Admissibility of Expert Evidence: Proving the Basis for an Expert's Opinion' (2001) 33 *Sydney Law Review* 427.

[175] *Makita (Australia) Pty Ltd v Sprowles* (2001) 52 NSWLR 705, [85].

[176] Gans and Palmer, above n 3.

[177] Ian Freckleton and Hugh Selby, *Expert Evidence- Law, Practice, Procedure and Advocacy* (Thomas Reuters, 4th ed, 2009) 1.

[178] Ibid 4.

[179] Frank Vincent, *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (2010) Parliament of Victoria <http://www.parliament.vic.gov.au/papers/govpub/VPARL2006-10No301.pdf> ('Vincent Report').

[180] Gary Edmond, 'What Lawyers Should Know about the Forensic "Sciences"' (2015) 37 *Adelaide Law Review* 33.

It is vital that experts themselves and the lawyers calling experts and relying on their reports clearly understand the role of the expert in the courtroom.[181] The Crown Prosecutors Service (CPS) in the UK has published a 'Guidance for Experts' booklet, introduced by the former Attorney-General Lord Goldsmith.[182] In this booklet, Goldsmith refers to the three 'Rs' — retain, record and reveal. In summary, this means that UK experts must retain everything pertinent to their enquiries and findings unless otherwise instructed, begin making records at the time of receipt of instructions from a party and reveal everything they have recorded.[183] This ideally enables the prosecution team to be aware of all the material in an expert's possession and to decide what is relevant to their case and what they must do to satisfy disclosure requirements.

The role of expert witnesses as persons whose opinions may be admissible is defined by the rules of evidence in each jurisdiction[184] and by the behaviour of the parties.[185] An expert can only answer those questions asked by lawyers and may only give evidence in response to those questions.[186] If an expert feels that his or her evidence has been portrayed incorrectly and the strengths and weaknesses of the evidence have not been given due consideration, there is little the expert might do to rectify that impression. It is largely the role of the parties under the adversarial system to introduce evidence and thus decide what is relevant, and in Australia, if the evidence of an expert requires clarification, it is primarily the lawyers, parties or judicial officers who may make this decision and act on it. This is not the role of witnesses. The *Commission on Proceedings Involving Guy Paul Morin* in Canada[187] recognised the problems that this may create for expert witnesses. It considered the possibility that at the completion of experts' evidence, judges may exercise their traditional right to address witnesses directly and enquire as to whether the true nature of their evidence has been frustrated by questioning during the course of trial.[188] This measure may ensure that experts are able to

[181] Goldsmith, above n 8, 4.

[182] Ibid 6.

[183] Ibid.

[184] See s 79 of the Uniform Evidence Acts.

[185] D Lucas, 'The Ethical Responsibilities of the Forensic Scientist: Exploring the Limits' (1989) 34 *Journal of Forensic Sciences* 719, cited in Rhonda Wheate, *Jury Comprehension and Use of Forensic Evidence* (PhD Thesis, University of New South Wales, 2007) 123.

[186] Simon Walsh, 'Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature' (2005) 155 *Forensic Sciences International* 51, 56.

[187] Fred Kaufman, *Commission on Proceedings Involving Guy Paul Morin* (1998) Ontario Ministry of the Attorney General, 1.

[188] Ibid Chapter 2: Forensic Evidence and the Centre of Forensic Sciences, Recommendation 12, 349, quoting David Butt, an appellate Crown attorney with the Ministry of the Attorney General.

communicate additional and important corrections to incorrect interpretations or presentation of their evidence in court.

3.6 Rules governing criminal procedure

This section aims to explore the current legal rules governing criminal procedure in cases involving DNA evidence. It considers both statute and practice directions relevant to the handling and adducing this form of evidence. The duty to disclose certain information (including DNA results that exclude or do not exclude an accused) is also a relevant rule to both defence and prosecution barristers and solicitors. Where there are also practice directions or legislation relevant to forensic biologists or statisticians giving DNA evidence, these too are briefly introduced. Only provisions and practice directions that govern criminal procedure are considered here — the civil rules are outside this scope of enquiry but are footnoted below.[189] There are no specific legislative provisions or practice directions

[189] See Practice Note 4 of 2004, Commercial List of the Supreme Court of Victoria and the *Supreme Court (General Civil Procedure) Rules 2005* (Vic) – Order 44 and Form 44A 'Expert Witness Code of Conduct' for an example of a civil practice direction for experts in civil trials in Victoria. This outlines the following:

Expert Witness Code of Conduct

1. A person engaged as an expert witness has an overriding duty to assist the Court impartially on matters relevant to the area of expertise of the witness.
2. An expert witness is not an advocate for a party.
3. Every report prepared by an expert witness for the use of the Court shall state the opinion or opinions of the expert and shall state, specify or provide—
   (a) the name and address of the expert;
   (b) an acknowledgement that the expert has read this code and agrees to be bound by it;
   (c) the qualifications of the expert to prepare the report;
   (d) the facts, matters and assumptions on which each opinion expressed in the report is based (a letter of instructions may be annexed);
   (e) (i) the reasons for,
   (ii) any literature or other materials utilised in support of,
   (iii) a summary of—
   each such opinion;
   (f) (if applicable) that a particular question, issue or matter falls outside the expert's field of expertise;
   (g) any examinations, tests or other investigations on which the expert has relied, identifying the person who carried them out and that person's qualifications;
   (h) a declaration that the expert has made all the inquiries which the expert believes are desirable and appropriate, and that no matters of significance which the expert regards as relevant have, to the knowledge of the expert, been withheld from the Court;
   (i) any qualification of an opinion expressed in the report without which the report is or may be incomplete or inaccurate; and
   (j) whether any opinion expressed in the report is not a concluded opinion because of insufficient research or insufficient data or for any other reason.
4. Where an expert witness has provided to a party (or that party's legal representative) a report for the use of the Court, and the expert thereafter changes his or her opinion on a material matter, the expert shall forthwith provide to the party (or that party's legal representative) a supplementary report which

that govern or inform lawyers' treatment of DNA evidence in either Victoria or the ACT. General rules or directions may, however, be relevant.

3.6.1 Victoria

The *Criminal Procedure Act 2009* (Vic) and *Supreme Court (Criminal Procedure) Rules 2008* (Vic) govern criminal procedure in the Supreme Court of Victoria. Of note in the former piece of legislation are ss 50 and 189. These provisions govern different stages of pre-trial disclosure by the defence of their intention to call an expert and how soon before trial this must be disclosed. They also require disclosure of the 'substance of the evidence it is proposed to adduce from the witness as an expert, including the opinion of the witness and the acts, facts, matters and circumstances on which the opinion is formed.'[190] This Act applies in all criminal courts in Victoria.

All barristers must also adhere to the *Victorian Bar Inc Practice Rules and Rules of Conduct*[191] and the *Compulsory Continuing Legal Education Rules 2008,*[192] as established by the Victorian Bar.[193] These rules specify the number of hours of continuing education that lawyers must complete to obtain the requisite 10 Continuing Professional Legal Education (CPLE) points in each year. How these points are allocated is discussed in the Rules. Education about DNA evidence for lawyers is discussed in Chapter 7.

Since the miscarriage of justice that occurred in *Jama*, the Victorian DPP has inserted the following proviso into the DPP guidelines on prosecutorial discretion:

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shall state, specify or provide the information referred to in paragraphs (a), (d), (e), (g), (h), (i) and' (j) of clause 3 of this code and, if applicable, paragraph (f) of that clause.

5. If directed to do so by the Court, an expert witness shall—
   (a) confer with any other expert witness; and
   (b) provide the Court with a joint report specifying (as the case requires) matters agreed and matters not agreed and the reasons for the experts not agreeing.
6. Each expert witness shall exercise his or her independent judgment in relation to every conference in which the expert participates pursuant to a direction of the Court and in relation to each report thereafter provided, and shall not act on any instruction or request to withhold or avoid agreement.

[190] *Criminal Procedure Act 2009* (Vic) ss 50(2)(c), 189.

[191] Victorian Bar Council, *Practice Rules* (23 September 1997) Victorian Bar <http://www.vicbar.com.au/uploads//publications/The_Victorian_Bar_Incorporated_Practice_Rules_220910.pdf>.

[192] Victorian Bar Council, *Compulsory Continuing Legal Education Rules* (1 April 2008) Victorian Bar <https://www.vicbar.com.au/GetFile.ashx?file=pdf/VicBarCPDRules2008with18Feb08editsandnewattendanceform_000.pdf>.

[193] See website at <www.vicbar.com.au>.

> In any matter in which the prosecution case is wholly or substantially reliant upon DNA evidence, the prosecution should not be instituted or continued until specific instructions have been sought from the Director or in his absence, the Chief Crown Prosecutor.[194]

This proviso aims to limit the cases that are prosecuted in reliance on DNA evidence alone and to give lawyers guidance in assessing DNA evidence-only cases, by enlisting the advice and imprimatur for prosecution of the Director or Chief Crown Prosecutor in such cases. The purpose is to ensure that prosecutors are not beguiled by DNA evidence into assigning it undue weight when applying the reasonable prospects of conviction test to their determinations of whether to proceed to trial. The research findings discussed in Chapter 3 reveal that lawyers can overestimate the probative value and infallibility of DNA evidence.[195] This may induce them to unwisely institute prosecutions relying on DNA evidence. The requirement for disclosure and consideration of all evidence, including DNA, by Victorian legislation[196] and DPP guidelines[197] gives tacit recognition to this problem and seeks to overcome it in this jurisdiction.

3.6.2 ACT

In the ACT, the *Legal Profession (Solicitors) Rules 2007*[198] and *Legal Profession (Barristers) Rules 2008*[199] broadly govern the conduct of ACT lawyers. Neither of these sets of Rules outlines any set procedure informing lawyers how to deal with DNA evidence, nor specifically with experts presenting DNA evidence.

Similarly, the Supreme Court 'Criminal Proceedings' provisions in the *Court Procedures Act 2004* (ACT) do not give insight into how lawyers should deal with expert evidence or more particularly with DNA evidence. Part 2.12 of the *Court Procedures Rules 2006* (ACT) governs expert evidence and includes definitions of relevant terms, eg expert, expert report and code of conduct,[200] and outlines the proper procedure for lawyers intending to adduce expert evidence. These Rules also provide an 'Expert

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[194] Director of Public Prosecutions (Vic), *Director's Policy: Prosecutorial Discretion* (24 November 2014) Office of Public Prosecutions Victoria, 20 <http://www.opp.vic.gov.au/getattachment/5b830306-a17b-4ada-9078-6982539d44ac/2-The-Prosecutorial-Discretion.aspx>.

[195] See for example, Victoria Grace et al, *Forensic DNA Evidence on Trial: Science and Uncertainty in the Courtroom* (ISCE Publishing, 2011) and W. C Thompson *'Forensic DNA Evidence: The Myth of Infallibility'* in Sheldon Krimsky and Jeremy Gruber (eds), *Genetic Explanations: Sense and Nonsense* (Harvard University Press, 2013). Thompson's chapter also highlights the main types of errors made by those using DNA evidence in criminal trials.

[196] *Criminal Procedure Act 2009* (Vic) ss 59, 189.

[197] Director of Public Prosecutions (Vic), above n 4.

[198] Created by the Law Society of the ACT by virtue of the *Legal Profession Act 2006*.

[199] *Legal Profession (Barristers) Rules 2008* (ACT).

[200] *Court Procedures Rules 2006* (ACT), Part 2.12.1.

Witness Code of Conduct' in Schedule 1 and lawyers wishing to engage an expert must give this Code of Conduct to all experts, prior to their giving oral evidence.[201] The Code of Conduct outlines the general duty owed by the expert to the Court, rather than one of the parties, what form expert reports must take and the procedure for expert conferences if they are requested by the Court.[202]

The various courts in the ACT give lawyers information on practice and procedure via practice notes published on the court websites. The Supreme Court of the ACT no longer has a practice direction regarding expert evidence, as two previous practice directions on the topic — PD 2/03 and PD 2/04 — were repealed by PD 1/06 entitled, *Court Procedures Rules revocation of Practice Directions and Notices to Practitioners*.[203] Nothing has replaced them to date. The Magistrates Court also does not have any practice directions relevant to lawyers' role in using and dealing with DNA evidence or expert evidence more broadly.

These rules obviously fail to cover how lawyers should deal with DNA evidence as a specific form of expert evidence. They cannot cover all elements of a lawyer's practice and in most cases, practice directions and court procedure statutes and rules are administrative in nature, detailing information on court forms and practice in specific court environments. Only the Victorian DPP Guidelines enacted since *Jama* show recognition of any dangers involved in dealing with DNA evidence and so lawyers must go elsewhere, particularly to decisional law, for guidance on how to use and manage this evidence in criminal trials.

3.7 Conclusion

Lawyers are guided in their criminal practice by legislation, case law, evidentiary rules and practice directions. There is very little guidance, however, for lawyers specifically using DNA evidence in criminal trials in either the ACT or Victoria. But this reflects the reality of using evidence that is common but rarely contentious, discussed in Chapter 5 below.[204] This chapter has outlined some of the forensic and legal considerations that must be considered when research into lawyers and DNA evidence is conducted. It also outlines and considers the implications of key human rights principles, including the right to a fair trial and the equality of arms principle, for the prosecution duty of

[201] *Court Procedures Rules 2006* (ACT), r 1202.

[202] See Unisearch Expert Opinion Services, *Expert Codes of Conduct and Court Guidelines*, Resources, <http://www.expertopinion.com.au/documents/ACT-Code-of-Conduct.pdf>.

[203] Supreme Court of the ACT, *Practice Direction,* (26 June 2006), Justice Department, Australian Capital Territory Government, <http://cdn.justice.act.gov.au/resources/uploads/Supreme/Practice_Direction_Court_Procedures.pdf>.

[204] Specifically see 5.2.

disclosure of forensic reports about DNA evidence. The behaviour of lawyers in their everyday criminal practice, as discussed in Chapter 5 generally, does not meet the standards of international human rights law instruments as ratified by Australia. Many tactical and cultural decisions are made based on the adversarial system in place,[205] rather than human rights obligations placed on those in the legal profession to uphold the right to a fair trial. Evidentiary rules are introduced and the lack of practice directions in both Victoria and the ACT for using DNA evidence is noted. The notion that lawyers' knowledge about DNA evidence and their level of competence in dealing with this evidence may have a bearing on the right to a fair trial is introduced.

Chapter 4 will now introduce the methodology used in this research project, complete with a discussion on the interpretive paradigm used, the use of qualitative research methods and how computer assisted qualitative data analysis software assisted with the analysis. The ways in which the validity and reliability of the qualitative interviews and focus groups was guaranteed will also be explained.

[205] Specifically see 5.7 and 5.8.

4 Methodology

4.1 Introduction

The practice of law cannot be separated from theory, interpretation and argument. This chapter therefore contains not only a discussion of the qualitative methodology that was used in this research, but also briefly describes the ontological, epistemological and methodological considerations that were relevant to the research design and analysis.[1]

The chapter will explore four main areas. The interpretive paradigm used and the philosophical underpinnings of the methodology and research design will be explored and the research questions are introduced. The chapter also explains the qualitative research methods used and provides details about the interviews and focus groups conducted for the research, the participants involved and the interview and focus group questions. Then there is a focus on the analysis of the data obtained from interviews and focus groups and the chapter finishes by discussing how this research satisfies requirements for quality and rigour in qualitative research.

4.2 Interpretive paradigm

One of the key aims of this research is to provide information that will assist in improving lawyers' understanding of DNA evidence and advance their capacity to deal effectively with DNA evidence in criminal trials. This aim fits with the overall paradigm accepted for social science research — to improve our understanding of the world and the experiences of those who live in it.[2] It is an applied study,[3] aiming to ameliorate the problems lawyers face in using DNA evidence and to assist those who develop policy in this area. To gain understanding of the day-to-day practice of criminal lawyers, the research was framed within an interpretivist research framework or paradigm.[4] This gave the study a clear rationale and an underlying research philosophy. Legal research is at risk of being dysfunctional

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1 Gibson Burrell and Gareth Morgan, *Sociological Paradigms and Organisational Analysis* (Heinemann, 1979) 1–2.

2 Earl Babbie, *The Basics of Social Research* (Wadsworth, 6th ed, 2014).

3 David E Gray, *Doing Research in the Real World* (Sage, 2nd ed, 2009); W Lawrence Neuman, *Social Research Methods: Qualitative and Quantitative Approaches* (Pearson Education, 7th ed, 2009) 26.

4 This paradigm assumes that humans cannot be studied using the same models as for scientific research. The interpretive paradigm sees reality as constructed by the subjective perception and experiences of individual people. Research using an interpretive paradigm aims to discover how research participants understand and construct their social reality. For more information on underlying premises of an interpretive paradigm see Burrell and Morgan, above n 1, 28–32.

if it is not designed with a clear research philosophy in mind.[5] The ontological, epistemological and methodological premises adopted in this research are discussed below. All three have implications for the intellectual authority of this research.

Legal research, as a branch of social science, lends itself to interpretive enquiry. This paradigm approaches reality in a certain way — it acknowledges that there are multiple interpretations of 'reality,' all of which are of interest to the researcher.[6] In the context of this research, this means that 'truth', as espoused in this research, is that which is defined by the day-to-day experience of criminal lawyers, judges and forensic scientists rather than there being one universal 'truth' of the kind pursued in positivist research.[7]

Epistemological considerations are essentially assumptions about knowledge[8] and how one might begin to understand the world in which research is conducted. This research employs an inductive and empirical epistemological position — it does not test a research theory or hypothesis, but aims to establish patterns and uncover meaning as experienced by the participants.[9] Applied research[10] fits within these epistemological and ontological frameworks, because it insists on a research design that captures the insights and 'realities' — the attitudes, behaviours, value systems and beliefs — of participants, in this case, lawyers, judges and forensic scientists.[11]

4.3 Rationale for research design

This research aims not only to contribute to knowledge in the disciplines of law and forensic science, but also, as applied research, to be of use to criminal justice professionals by providing reform-oriented recommendations for improved practice in criminal cases involving DNA evidence.[12] More specifically, the study used action research to seek 'information on the attitudes and perspectives of practitioners in the field.'[13]

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5 Margaret McKerchar, *Design and Conduct of Research in Tax, Law and Accounting* (Thompson Reuters, 2010).

6 John W Creswell, *Qualitative Inquiry and Research Design: Choosing Among the Five Traditions* (Sage, 1998).

7 McKerchar, above n 5.

8 Burrell and Morgan, above n 1, 1.

9 Gray, above n 3.

10 See 4.3 below for further discussion of applied research categorised as 'action research'. See also ibid.

11 The epistemological view of knowledge being the product of a mixture of experiences and viewpoints.

12 See Chapter 8: Conclusions and Recommendations.

13 Gray, above n 3, 30. See Chapter 12 of that text for more information on action research. K Lewin, 'Action Research and Minority Problems' (1946) 2(4) *Journal of Social Issues* 34, defines action research as 'a process of combining theory and research to solve practical problems' (at 34).

Previous research has found that some forensic scientists, jury members and judges in various jurisdictions feel that lawyers struggle to understand and use DNA evidence.[14] The research method employed in this research was designed to uncover and explore[15] the difficulties that lawyers experience in dealing with DNA evidence so that possible mechanisms for achieving improved practice might be identified. It was important that participants were not constrained in their provision of information by a data gathering process that might limit them, for example, to answering predefined questions with predetermined possible answers.[16] It was also important that the research design ensured that lawyers and those working with lawyers would feel comfortable and were not inhibited in talking about areas of their own criminal practice in which they might lack confidence. A qualitative methodology was chosen as the most appropriate for creating an environment for gathering and exploring information of this nature.

Interviews and focus groups were selected as the two methods for data collection as they were most likely to elicit information on participants' potentially rich and varied experiences with DNA evidence.[17] If the responses to questions in interviews or focus groups referenced specific cases or interactions with forensic scientists, then the semi-structured nature of the interview also allowed for further exploration of the lawyer's experience. The process of selecting participants for interviews and focus groups is discussed below.[18]

4.4 Research questions

Research questions were developed regarding gaps in lawyers' knowledge and competency in dealing with DNA evidence suggested by the previous research in this area and the reviews of process discussed in Chapter 3. These reviews were driven by policy investigations like the *Strengthening Forensic Science in the United States: A Path Forward* report (NAS Report)[19] and individual cases of incompetence or wrongful conviction like that in the *Inquiry into the Circumstances that Led to the*

[14] See 2.2.2-2.2.5: Previous research for further discussion.

[15] Babbie, above n 2, gives three purposes for research — exploration, description and explanation (at 94–96).

[16] Pertti Alasuutari, *Researching Culture, Qualitative Method and Cultural Studies* (Sage, 1995) 42.

[17] See detailed discussion at 4.5.2–4.5.3: Interviews – Focus groups.

[18] See detailed discussion at 4.5.2 for discussion on the selection of participants.

[19] National Research Council Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) National Academy of Sciences, 12–13, 85–110 <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> ('NAS Report').

Conviction of Mr Farah Abdulkadir Jama (Vincent Report) [20] and many interview questions were written to address the gaps in knowledge suggested in these reviews.

This research investigates two primary research questions:

Research question 1 – What are lawyers' understandings of DNA evidence and what difficulties do they have in dealing with this type of evidence in criminal trials?

Research question 2 – What training opportunities and resources are available to lawyers on DNA evidence and what are lawyers' views about the value of those opportunities and resources?

4.4.1 Key areas explored in the research

The primary research questions embrace and necessitate investigation of three key areas — how lawyers use DNA evidence in criminal trials; the difficulties lawyers then have with DNA evidence; and the education and training opportunities available for lawyers on DNA evidence.[21] Investigation of each of these three areas required secondary research questions to be answered in order to explore the primary research questions posed above. Each area focuses on information about how criminal lawyers understand and use DNA evidence and not how they are *supposed* to understand and use DNA.[22] The secondary research questions in each of these three areas are discussed below.

Area A: Lawyers' use of DNA evidence in criminal trials

It is important to understand the practical experiences of lawyers in using and managing DNA evidence in criminal trials. Implicit in this use is their understanding or knowledge of the major threats to the reliability and accuracy of the DNA evidence that they adduce or challenge in these trials, as well as how they seek information from forensic scientists and police investigators regarding DNA evidence in individual cases. This study sought to gain insight into lawyers' experience in managing DNA evidence by engaging them, and those who work closely with them, in critical reflection on the role of lawyers in questioning police and forensic scientists both before and at trial. Four secondary research questions were posed to explore lawyers' management of DNA evidence in criminal cases.

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[20] See Frank Vincent, *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (2010) Parliament of Victoria <http://www.parliament.vic.gov.au/papers/govpub/VPARL2006-10No301.pdf> ('Vincent Report') and *R v Jama* [2008] VCC 0886.

[21] These three areas form the basis for the data and analysis chapters 5, 6 and 7.

[22] It is not enough to understand the rules and conventions that govern a community or system, to fully understand meaning one must also understand the objectives of the community or system being considered. See Martin Hollis, *The Philosophy of Social Science: An Introduction* (Cambridge, 1994) Chapter 7: Understanding Social Action, 166.

RQ 1A. What do lawyers understand DNA evidence to mean for their criminal practice?

This secondary research question relates to the first primary research question — how lawyers understand the fundamental concepts associated with DNA evidence. This question enquires into the day-to-day use and realities of using DNA evidence in criminal trials. It does not focus on whether lawyers' understandings are accurate; rather it specifically aims to explore how their understanding influences how they deal with DNA evidence in their criminal practice.

RQ 2A. What do criminal lawyers see as the limitations of DNA evidence?

This question also explores lawyers' understanding of DNA evidence, but focuses on what lawyers see as the limitations, if any, of DNA evidence. This understanding will influence their approach to DNA evidence and the degree to which they implicitly trust, and therefore challenge, the evidence in criminal trials.

RQ 3A. How can lawyers be more effective with DNA evidence in criminal cases?

This secondary research question assists in creating a benchmark for how lawyers might best understand and use DNA evidence. By determining how they can be most effective, recommendations for improved understanding and use can be made. This question, therefore, aims to explore lawyers' effectiveness in managing DNA evidence not only with lawyers, but also with those who work closely with them in their criminal practice — forensic scientists and judges.

RQ 4A. What is the process involved when criminal lawyers are given a case involving DNA evidence?

This question relates to how lawyers investigate and prepare for cases involving DNA evidence. This includes the preparatory steps they take after receiving a brief with DNA evidence, the information gathering they engage in with those involved the investigation phases of the case and with expert witnesses and later, the procedural steps adopted in adducing DNA evidence in court. This process, and lawyers' experiences of it, will give insight into lawyers' understanding of DNA evidence. Accordingly, it relates primarily to the first of the primary research questions.

Area B: Difficulties encountered by lawyers in using DNA evidence in criminal trials

The second area of investigation for this research explores the difficulties lawyers have in using DNA evidence in criminal trials. Research and reports on this subject[23] suggest that lawyers have some difficulty with understanding and/or adducing DNA evidence as expert opinion in criminal trials. Chapter 2 explores these criticisms in more detail. It is important for this research to learn what

[23] See Chapter 2: Justifications for the research.

difficulties lawyers experience in dealing with DNA evidence, so that recommendations can be made that may assist in their amelioration and thus the secondary research question RQ 1B below was explored.

RQ 1B. What do criminal lawyers find most difficult to understand about DNA evidence?

Asking lawyers what they find most difficult about DNA evidence assists in gaining an understanding of how and why they deal with DNA evidence in the way that they do. Part of ascertaining how lawyers understand DNA evidence is determining what it is that leads to misunderstanding, or what constrains them in learning about DNA evidence. Limitations in lawyers' understanding of DNA evidence might in fact impede them in identifying both their own problems and how best to remedy them.

Area C: Where to find information: education and training for lawyers on DNA evidence

The third area of investigation is the sources of lawyers' information about DNA evidence, and what education and training initiatives are available for lawyers in this area. Each of the secondary research questions in this area specifically addresses the second primary research question. Investigation of these matters began by ascertaining whether there are any statutory provisions and/or practice directions that provide legal direction for lawyers in how to present DNA evidence in criminal trials. It then established what educational programs are available to lawyers both prior to their admission as practitioners and to practising lawyers.

Once in practice, lawyers are required to attend CPD to retain their practising certificates.[24] This study gathered information on external provider-led courses for continuing education in this area and any other measures that lawyers said that they utilised to educate themselves about DNA evidence. Lawyers' opinions of these sources of knowledge are important, because they will influence their participation in the educational programs on offer and their use of other sources of information and thus any improvement in their knowledge in this area.

RQ 1C. What form of continuous legal education is available to criminal lawyers in Victoria and the Australian Capital Territory (ACT) on the use of DNA evidence, and how does this compare nationally and internationally?

Lawyers' understanding of DNA evidence may be influenced by training or continuing professional development in this area. Asking lawyers about their experience of training will help in analysing how successful these programs are in improving their knowledge in this area.

[24] *Continuing Professional Development Rules 2008* (Vic) rr 6–7; *Mandatory Continuing Professional Development Scheme 2007* (ACT), r 2.4.

RQ 2C. What is the lawyer experience of education or training on DNA evidence?

This secondary research question goes further than RQ 1C by gathering lawyer's opinions of formal educative initiatives with the view of discussing the adequacy of programs offered and their likelihood of improving lawyers' knowledge and practice in this area. Answers to this question directly relate to the recommendations made in Chapter 8 of this thesis.

RQ 3C. Where do criminal lawyers get information to help them with briefs in criminal trials involving DNA evidence?

Having data on the sources of information on DNA evidence for lawyers is important when assessing whether lawyers talk to the most qualified professionals about the science and whether they access the best and most accurate sources of information on DNA evidence. Whether or not they do so has implications for their understanding of the evidence. This issue relates to the first primary research question because it seeks information on how lawyers develop their knowledge of DNA evidence.

4.5 Qualitative research methods

Qualitative research offers a naturalistic approach to understanding how individuals in certain environments experience reality in their day-to-day lives.[25] The research questions above focus on lawyers' day-to-day experiences with DNA evidence. As noted above, the aim of the study is to expose, with participants' co-operation, lacunae in their knowledge and possible concerns they have about their own competence or confidence in dealing with this evidence. Accordingly, by its very nature, this investigation required an environment in which participants could speak freely and reflectively on their experience. One-on-one interviews were considered to provide the best means for enabling participants in this research to give genuine, unguarded explanations and feedback in their own words about what they understand DNA evidence to mean for their criminal practice. The interviews themselves were designed with a view to gaining penetrative insights into the subtleties of individual experiences in using DNA evidence. The role of the researcher in this research was to develop a 'deep, intense and 'holistic' overview of the context under study.'[26]

[25] See Gray, above n 3; Creswell, above n 6.

[26] Gray, above n 3, 164.

4.5.1 Ethics approval

Full ethics approval was granted for the study by the University of Tasmania's Social Science Human Research Ethics Committee.[27] This ethics approval was accepted by the Australian Federal Police's Ethics Committee for focus groups with employees. The focus groups with Victoria Police forensic biologists were approved by the Victoria Police Human Research Ethics Committee. All interviewees gave consent[28] for the interviews to be audio-recorded and this was done using an Olympus digital voice recorder. In accordance with ethics requirements, names of criminal lawyers and cases they used as examples were de-identified during the transcription of those interviews to text. These documents then formed the basis of analysis for this research.

4.5.2 Interviews

One-on-one interviews were conducted with practising criminal lawyers in two Australian jurisdictions, Victoria and the ACT.[29] These jurisdictions were selected for two main reasons — first, because they are relevant to the ARC funded 'Effectiveness Project' of which this research was a part,[30] and, second, because both have seen cases at the local court level (and in the ACT, at the High Court level) in recent years where DNA evidence has comprised either the central point of an appeal[31] or been subject to formal investigations for alleged contamination.[32] Accordingly, criminal lawyers in both these jurisdictions are well placed to provide information relevant to the research questions set out above.

Selection of participants

Forty practising criminal lawyers were interviewed for the study. The lawyers were drawn from several sources including criminal justice organisations funded by government — Legal Aid (Victoria and the ACT), the Office of Public Prosecutions (Victoria) and the Department of Public Prosecutions (ACT) —

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[27] Full ethics approval was granted by the University of Tasmania's Social Science Human Research Ethics Committee, project number H0011621.

[28] Via a signed consent form that was administered with an information sheet outlining the study.

[29] Steinar Kvale, *Doing Interviews* (Sage, 2007). The qualitative research interview is defined by Kvale as 'an interview with the purpose of obtaining descriptions of the lifeworld of the interviewee with respect to interpreting the meaning of the described phenomena' (at 8).

[30] Tasmanian Institute of Law Enforcement Studies, *Effectiveness of Forensic Science in the Criminal Justice System* (13 April 2016) University of Tasmania <http://www.utas.edu.au/tiles/research/current-projects2/the-effectiveness-of-forensic-science-in-the-criminal-justice-system>.

[31] See *Forbes v The Queen* [2009] ACTCA 10.

[32] See *R v Jama* [2008] VCC 0886.

and lawyers working outside of these organisations in law firms or at the Private Bar in both jurisdictions.

Directors or Senior Managers of the government justice agencies were the initial liaison point for contact with government criminal lawyers. When senior management or Directors of these organisations gave consent for employees to take part in the project, consent was obtained from each lawyer who expressed an interest in participating. This was done by email communication and using individual consent and information forms.[33] Managers and Directors of the government agencies were sent the invitation to participate and were encouraged to circulate these to criminal lawyers of varying levels of experience within their organisation. The only requirement was that the lawyers have some experience in criminal cases where DNA evidence was involved in some way — contentious or otherwise. Many of the lawyers who participated were experienced criminal law practitioners with a wide variety of trial involvement over more than 20 years. However, many were also at an earlier point in their legal career. Experience in the law was not determinative of participation or selection as an interviewee. In fact, it was desirable that participants included both inexperienced and experienced practitioners to reflect the landscape of practising criminal lawyers in each jurisdiction. Eighteen prosecutors working for the State Department (ACT) or Office of Public Prosecutions (Victoria), including Crown Counsel in Victoria were interviewed and twenty-two independent or government defence solicitors or barristers from Legal Aid and the Private Bar also took part.

Lawyers working for law firms and the Private Bar were selected using a purposive or judgemental sampling approach and lawyers who had experience managing trials with DNA evidence were ideal interviewees.[34] Both barristers and solicitors were contacted by email using the addresses given on their own or their Chambers' or legal firms' websites. These lawyers had distinguished themselves as specialising in criminal law and were identified using a general internet search.[35] Five barristers practising at the Private Bar responded to the invitation to participate and all five were interviewed.[36] Lawyers are referred to in this thesis as research participants beginning with the letter 'L', for example, L33.

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[33] Ethics forms containing Information Sheets and Consent Forms (see Appendix C and Appendices D and E) were sent to participants.

[34] Earl Babbie, *The Practice of Social Research* (Wadsworth, 13th ed, 2013) 190–191; Colin Robson, *Real World Research: A Resource for Social Scientists and Practitioner-Researchers* (Blackwell, 2nd ed, 2002).

[35] Search terms included 'criminal lawyer', criminal, lawyer, Melbourne, Victoria, Canberra, 'Australian Capital Territory' and DNA.

[36] This number did not include the barristers working as Counsel for Legal Aid in Victoria or Victorian Crown Counsel working mostly for the Office of Public Prosecutions.

Interview and focus group participants — lawyers, judges and forensic scientists — are known in criminological research to fall into the category of 'elites',[37] — those in higher socio-economic circles than the average member of society, or the researcher.[38] This requires particularly specific preparation and organisation of interviews and focus groups with the acknowledgment that 'elites' usually have limited availability due to busy schedules and there is therefore less time available for 'getting to know' interviewees. Lawyers were extremely generous with their time. Most one-on-one interviews lasted between forty minutes and one hour. They took place during business hours and at the participants' workplaces.

Interview questions

The interviews were semi-structured or 'guided', so that although the interview schedule was devised by reference to pre-determined research questions, the interview questions themselves were flexible.[39] Interviewees were very much part of the interview process, actively shaping the course of the interview rather than passively responding to the interview schedule.[40]

The research questions investigated in the study dictated that the interview questions focus on the gaps in lawyers' knowledge revealed by existing research, reviews and investigations following cases of incompetence or wrongful conviction.

All the interviews contained, in some way, the subject matter discussed below.[41] They were not necessarily discussed in this order and were couched differently depending on the subject matter being considered at the time. In the discussion below explanations are provides as to which research question the interview questions relate to and how they elicit information relevant to the research questions. Other interview questions are listed at 10.6 in Appendix F below.

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[37] See Sotirios Sarantakos, *Social Research* (Macmillan, 4th ed, 2013). See also Kelly Richards, 'Interviewing Elites in Criminological Research: Negotiating Power and Access and Being Called "Kid"' in Lorana Bartels and Kelly Richards (eds), *Qualitative Criminology: Stories From the Field* (Hawkins Press, 2011). This is contrasted with much of the criminological research with a focus on interviewing 'down' (talking to people in lower-socioeconomic circumstances or career positions than themselves) rather than interviewing 'up'. Also see Rosanna Hertz and Jonathan B Imber (eds), *Studying Elites Using Qualitative Methods* (Sage, 1995); Teresa Odendahl and Aileen M Shaw, 'Interviewing Elites' in Jaber F Gubrium and James A Holstein (eds), *Handbook of Interview Research: Context and Method* (Sage, 2001) 299–316.

[38] Richards, above n 37.

[39] Steinar Kvale, *InterViews: An Introduction to Qualitative Research Interviewing* (Sage, 1996).

[40] Nigel King and Christina Horrocks, *Interviews in Qualitative Research* (Sage, 2010).

[41] These are directly related to the research questions discussed above. The full interview schedule is contained in Appendix F.

IQ 1. Where do criminal lawyers get information to help them with briefs containing DNA evidence in criminal trials?

This question was addressed by asking criminal lawyers how they had learnt about DNA evidence. They were asked whether they had found the learning process useful and how they could have approached learning about DNA evidence more productively if they had the time to do so. Questions about where criminal lawyers go for guidance on DNA evidence — other criminal lawyers, experts, texts, and the internet for example — were discussed with criminal lawyers if they indicated that this had been their experience.

Criminal lawyers were asked if they felt there was a gap in their knowledge of DNA evidence and how best they felt those gaps could be filled and their knowledge improved. These questions then led to interview questions associated with the following research question.

IQ 2. What level of understanding do criminal lawyers have of DNA evidence in criminal trials?

Criminal lawyers were asked about their experience with cases involving DNA evidence and what they understood the evidence to mean in relation to both non-contentious cases with routine briefs, and/or contentious cases involving DNA evidence that may have been unusual in their experience. Many criminal lawyers discussed cases in detail while others focused on the problematic areas of DNA evidence. They were asked how often their briefs involved DNA evidence and how confident they felt in handling this evidence.

The level of importance each lawyer attached to DNA evidence was explored by asking about the extent to which it might be determinative of case outcomes. Prosecutors were asked if it influenced their decision to prosecute and defence lawyers were asked whether it influenced their decision about how to advise a client in relation to plea.

IQ 3. What do criminal lawyers see as the limitations of DNA evidence?

This research question was replicated exactly by the researcher as one of the key interview questions. In addition to asking about the limitations of DNA evidence, lawyers were asked a more theoretical question about their views on reconciling the science of DNA match probabilities in a legal environment with a legal standard of proof of beyond reasonable doubt. This was added after the first interviewee expressed an opinion about how complicated the relationship between probability evidence and the burden of proof in serious criminal cases was and that this is a limitation of DNA evidence. This sheds light on the primary research question about how lawyers use DNA evidence and what they understand the import of such evidence to be in criminal trials in that their understanding of the limitations of DNA evidence guides their practical experience in using it in their criminal practice.

IQ 4. What is the process involved when criminal lawyers are given a case involving DNA evidence?

Criminal lawyers were asked a series of questions about the process they follow in cases with DNA evidence. This included consideration of whether it was their role to investigate the evidence in detail and ask probing questions of forensic scientists, or whether they considered that this encroached on the role of the forensic expert.

IQ. 5 What do criminal lawyers find most difficult to understand about DNA evidence?

IQ. 6 What makes an effective criminal lawyer in cases involving DNA evidence?

Similarly, to research question four, these two secondary research questions were delivered as interview questions in these or similar words to all participants.[42]

IQ 7. What form of continuous legal education is provided to criminal lawyers in Victoria and the ACT on DNA evidence in criminal trials, and how does this compare nationally and internationally?

The first half of this question was addressed by asking criminal lawyers whether they had taken part in formal training courses or CPD sessions on DNA evidence. For those that had, the researcher asked about their experiences — whether the courses were useful for their practice and why. Linked to the previous research question was the investigation of what would be most useful for criminal lawyers by way of formal education on DNA evidence. An analysis of the courses available both in Australia and overseas was undertaken with comparisons made between the course content and the responses from lawyers as to the usefulness of continuing professional education and their previous experiences learning about DNA evidence.[43]

4.5.3 Focus groups

Selection of participants

In addition to criminal lawyers' subjective experiences with DNA evidence and their knowledge of that evidence, the perspectives of those observing or interacting with criminal lawyers using DNA evidence in criminal cases was sought. This meant that the analysis did not rely solely on lawyers' observations of themselves. It therefore avoided, to some degree, the possibility that the data were skewed by participants' inadequate representation of their own abilities.

As senior members of the legal profession, judges overseeing criminal cases were an obvious choice for inclusion in the study. Forensic scientists who presented evidence in court and had been involved

[42] See justification for these as research questions above.

[43] See Chapter 7: Educating lawyers about DNA evidence.

in questioning from and conversations with criminal lawyers were also seen as appropriately qualified to reflect on how criminal lawyers understand and deal with DNA evidence. Because the questions directed to these two groups of professionals were about their opinions of others (rather than their own practice), focus groups rather than interviews were considered to provide the appropriate method of data collection. At times the 'interviewer' acted as a chair, attempting to allow for multiple responses to each question at the same time from the various professionals taking part. Gathering information from more than one person at a time meant that focus group participants 'bounced' ideas off one another and were prompted to recall various experiences that they had forgotten to discuss.[44] Often the response of one participant would prompt others to reflect on experiences that were relevant to the practice of lawyers with DNA evidence. Other advantages of conducting focus groups with judges and forensic scientists were the access to greater numbers of participants, the low cost, ease of organisation and limited interruption both to court business and to the laboratory work of the forensic scientists.

Two types of focus groups were held — those with forensic scientists and those with judges. Participants had homogeneity in their professions and were thus able to answer questions about lawyers, depending on their experience but the responses themselves were not homogenous, instead presenting a variety of opinions on how lawyers manage and use DNA evidence. An invitation to take part in the focus groups was extended to all the Supreme Court judges in Victoria and the ACT. All four members of the ACT Supreme Court Bench took part in a focus group in Canberra and three of the possible thirty Victorian Supreme Court judges elected to take part based on their interest in the project and their experiences on the bench with DNA evidence.[45] These groups were not intended to be representative samples. Valid research, as espoused by an interpretive research paradigm and qualitative research does not require a certain number of participants, nor do participants need to represent a broad spectrum of relevant people.[46] The experience of any number of the professionals in this area is valid, and provides potentially rich data and insight into how lawyers understand and deal with DNA evidence in criminal practice. The judges had varying experience on the Bench but had all been legal practitioners for over 25 years prior to their judicial appointment. Supreme Court judges were, as expected, very busy,[47] but in each jurisdiction, could dedicate time to these focus groups.

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[44] Richard A Krueger, *Focus Groups: A Practical Guide for Applied Research* (Sage, 4th ed, 2008).

[45] This number (32) includes the Chief Justice and judges from the Trial Division, but not judges from the Court of Appeal.

[46] See discussion of validity below at 4.7.1–4.7.3.

[47] See earlier discussion of elites, above n 37.

The head of the Australian Federal Police and Victorian Police forensic science laboratories sent out invitations to forensic biologists in their organisations inviting DNA specialists who had been involved with criminal lawyers to talk about their experiences as part of a focus group. Five Australian Federal Police forensic biologists took part in one focus group.[48] Three focus groups were held in Victoria, with a total of 14 Victorian DNA specialists involved. The forensic scientists had varying levels of experience. In Victoria, forensic biologists may reach court reporting positions after one or two years' experience.[49] In the ACT, forensic scientists may have to wait until they have five years' experience — but whether a forensic scientist presents evidence in court depends on their experience and ability to prove specialised knowledge in forensic biology[50] and therefore meet the requirements of s 79 of the *Evidence Act 2008* (Vic) and *Evidence Act 1995* (Cth). Each focus group with the Supreme Court judges and forensic biologist groups lasted for approximately one hour. Judges are referred to in this thesis with the letter 'P', for example P2, and forensic scientists that took part in focus groups are referred to by 'FS', for example FS10.

All participants gave their consent for the focus groups to be audio-recorded.

Focus group questions

Like the interview questions, the focus group questions were semi-structured and explored the research questions but were also flexible in their approach, content and order. The same questions were directed to each of the forensic scientist groups. Because many of the focus group questions were the same as the interview questions, they are summarised in dot point form below and the full Schedule of focus group questions may be found in Appendix B.

Forensic scientists

FGQ1. What experiences have you had with criminal lawyers on cases where you have provided the case with DNA evidence?

FGQ2. How do criminal lawyers understand the DNA evidence you present?

- How do you find they explain it for judges/juries?

[48] There are fewer forensic scientists practising in the ACT's Australian Federal Police Laboratory than that of the Victorian laboratories.

[49] Email communication from Dr Bryan Found, Victoria Police Forensic Laboratory answering on behalf of Steven Fowler, Branch Manager to Kate Cashman, 17 October 2013.

[50] Email communication from Dr Simon Walsh, Coordinator, Biometrics Forensic and Data Centres, Australian Federal Police Forensic Laboratory to Kate Cashman, 22 October 2013.

FGQ3. How much should criminal lawyers understand about DNA evidence in criminal trials?

- What can they do better?

FGQ4. In your opinion, how should we endeavour to teach criminal lawyers about DNA evidence?

FGQ5. From your experience, how does a competent lawyer deal with DNA evidence?

Judges

FGQ1. How often do the cases you oversee involve DNA evidence?

FGQ2. How important is DNA evidence in criminal trials (to what extent is it determinative)?

FGQ3. How do criminal lawyers explain DNA evidence for juries?

FGQ4. Have you done any training courses in forensic and DNA evidence as a lawyer and/or a judge?

- If yes, what was useful and why?

FGQ5. How best could criminal lawyers' knowledge be improved?

FGQ6. Should criminal lawyers have an in depth understanding of DNA evidence, or is this the role of experts?

FGQ7. What does an effective lawyer do when using and presenting cases involving DNA evidence?

Discussion of the data collected in these focus groups and the interviews with lawyers is presented in chapters 5 (The realities of legal practice for Australian criminal lawyers), 6 (Difficulties with DNA evidence) and 7 (Educating lawyers about DNA evidence).

4.6 Analysis

Data analysis in qualitative research incorporates data reduction, data display and the drawing and verification of conclusions from those data.[51] The analysis for this research was conducted in several phases. The first constituted preliminary data analysis undertaken during the interview and focus group data collection process. The second phase of data reduction involved transcribing the interview and focus group data verbatim[52] into large numbers of Word files that were managed and displayed using the computer-assisted qualitative data analysis software, NVivo. NVivo was used both to

[51] Matthew B Miles and A Michael Huberman, *Qualitative Data Analysis: An Expanded Sourcebook* (Sage, 2nd ed, 1994).

[52] See below 4.6.2–4.6.3.

organise the data and assist in coding and conducting a thematic analysis of the data to answer the primary and secondary research questions discussed above.

4.6.1 Preliminary analysis

The purpose of preliminary data analysis is to keep track of data during the collection process and to follow up on issues that emerge from interviews as they take place.[53] In this research, preliminary data analysis was undertaken by creating research memos (these also assisted in coding and analysis) where emerging themes and ideas were recorded by the researcher during the interview process. Ideas and notes taken in earlier interviews contributed to the development of more specific and targeted questions in later interviews and focus groups. An excerpt of such a memo is provided below. This was prompted after the transcription of an interview conducted on 22 June 2011.

> lawyers discuss the possibility of learning about DNA from other lawyers — but what about the issues of passing on incorrect information?[54]

In an interview conducted on 23 June 2011, an interviewee was critical of an introductory DNA course that the interviewee had attended — the third of this form of course in as many years. That interview prompted the following thought by the researcher — written as a research memo:

> DNA 101 is not the answer — if we keep providing education in this way, lawyers will continue to be criticised for not engaging with the evidence enough. What we need is an acknowledgment that the adversarial system will always have that 'senior/junior, master/clerk situation' and that lawyers will approach others for information: maybe having access to the information is enough? Where to find the information is a skill that could assist if and when lawyers get a case?[55]

These memos (and others) assisted in the development of a number of the recommendations and proposals for reform generated by the data described in Chapter 5 and the analysis in chapters 6 and 7.

4.6.2 Computer Assisted Qualitative Data Analysis (CAQDAS): NVivo

The process of data display and drawing conclusions from the data was assisted using the qualitative data analysis (QDA) software program, NVivo.[56] QDA programs create an audit trail of processes undertaken and analysis as they develop through coding.[57] This program was chosen for several

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53 See Carol Grbich, *Qualitative Data Analysis – An Introduction* (Sage, 2007).

54 Kate Cashman, Research Memo Entry, 23 June 2011.

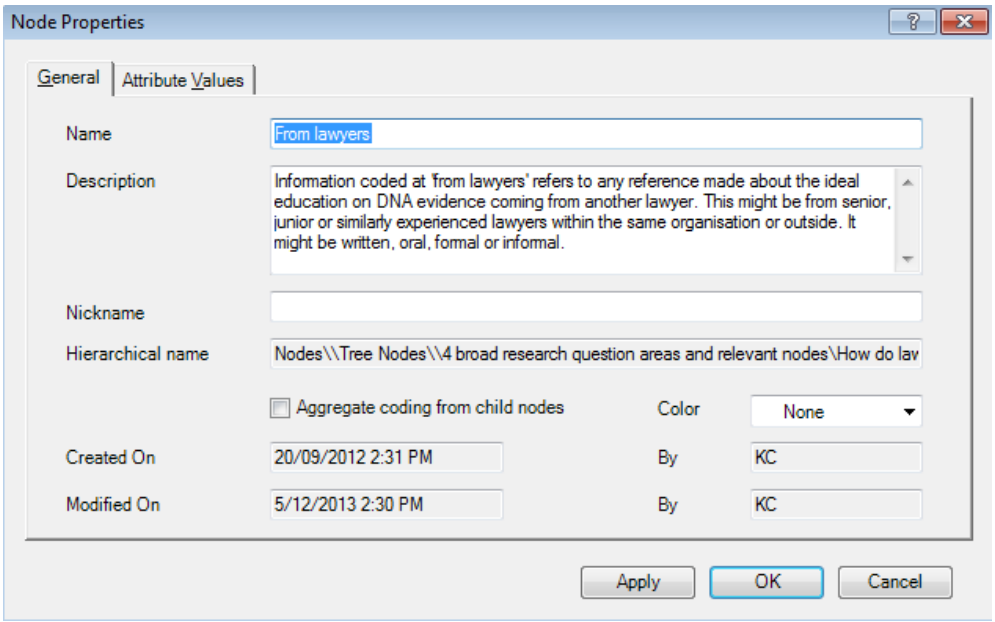
55 Kate Cashman, Research Memo Entry, 22 June 2011.

56 Further information about NVivo can be found from the QSR website at <http://qsrinternational.com/>.

57 Marilyn Tallerico, 'Computer Technology for Qualitative Research: Hope and Humbug' (1992) 30 *Journal of Educational Administration* 32.

reasons. First, NVivo provides the capability to transcribe data directly into the program to create projects or files, or import text files in various formats.[58] Second, it is easy to use — the Microsoft user interface is easy to understand and instruction on its use is clear and concise. Third, it enables large quantities of unstructured qualitative data to be stored, searched, organised, retrieved and analysed in a systematic, consistent and logical manner. The forty interviews and six focus groups conducted for this research generated large quantities of initially unstructured text that required storage and effective management of the coding process. Fourth, it contains many useful functions including the ability to create 'memos' and annotations, so that notes can be added to a coded document to ensure more thorough reflective practice during the coding process. Some of the memos created in this research were done in this way in addition to those written directly into Word files during preliminary data analysis. Finally, NVivo enhances coding reliability by enabling descriptions to be added to the codes created, allowing the researcher and those checking the coding system to understand how and why codes were named in a particular way. NVivo allows for each code to be given a 'description' so that further information about the data stored at that code can be given, which helps to ensure that the coding process is reliable, consistent and transparent. This ensures that codes may be verified by others reviewing the nodes created.

Figure 1 – Node properties: descriptions of the 'from lawyers' code



The use of NVivo

[58] Version 10 of the software also allows for audio, video, social media, pictorial and internet information to be uploaded for analysis.

NVivo refers to categories created for data as 'nodes'. Each transcript of data is coded into several 'nodes', and as each new node is developed, a description of why it is named or 'coded' in a particular way can be added. These descriptions, and indeed the nodes allocated to text within a transcription may be changed over time as the examination of the data and transcripts progresses — some nodes may be found to overlap and collapsed into a single node; certain themes may be subsumed into primary nodes; the meaning of certain words may change over the course of coding and descriptions of nodes may change. All this occurred at some point throughout the coding process in this research.

Nodes are divided into two categories — free nodes and tree nodes. Coding begins with the creation of free nodes, which designate loose, often initially unrelated themes identified in the data that may later be revisited and retained or further categorised into tree nodes. Tree nodes are clusters of related themes that are kept with 'branches' of relevant sub-themes beneath free nodes. An example from the present study is the following excerpt from an interview with one Crown Counsel on the relationship between science and law in the courtroom:

> Yeah but also different ways of thinking about things. I just think scientists and DNA evidence is a bit like that — you've got something where they do this statistical analysis and it says 28 billion to 1 sort of thing, but can you get a scientist or will a scientist ever be prepared to say that means that that was his blood? And the answer is no they won't. They'll say it provides extremely strong support for it which most of us would consider to be a substantial understatement if the science is right.
>
> So I think it's that sort of tension between science and the legal process because in the criminal courts you have to make decisions. In the end the jury will have to make a decision that they are satisfied beyond reasonable doubt of guilt? And in reality, even though no one ever says it, they really need to be certain. That's not what the standard of proof is — it's not certainty, but in reality, it is. And scientists would never be certain about anything it [the DNA result] says.[59]

This selection of text was coded into several nodes — 'science and law'; 'language and terminology difficulties' and 'beyond reasonable doubt'. It was initially categorised into free nodes of 'difficulties with DNA' and 'communication' before being restructured into the relevant research question tree nodes and the tree nodes listed above. NVivo understands that the context of coded data is important and thus allows navigation between a display of the coded data and original data source. This function allowed information to be considered in context in the original interview or focus group transcripts and therefore helped to ensure rigour and reliability in the analysis.[60]

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[59] Interview with L3 (22 June 2011).

[60] See 4.7 below.

Each interview or focus group transcript represented a single data source. These were continually sorted, labelled, coded and re-organised. Over time, various nuances were exposed as categories and labels were refined and relationships between various themes were discovered.[61]

Every 'difficulty' lawyers were said to have with DNA evidence was recorded. This enabled the frequency with which problems arose to be measured and the most common difficulties to be identified. In accordance with the aims of reform-oriented applied research this enabled target areas for reform and the development of education programs to be identified.[62]

4.6.3 Development of codes and thematic analysis

The coding approached the classification of data in two ways. The first was 'a priori' coding — based on themes pre-determined by the literature and the research questions, and 'emergent' coding for the themes identified throughout the transcription and NVivo coding process. This coding process is inherently inductive. Codes were determined and dictated by themes found in the content of the transcripts rather than per any broad legal or criminological theories. There were three stages to the emergent coding process: open coding, axial coding and selective coding. This process is like that supported by a grounded theory methodology[63] even though this research did not follow a grounded theory approach to the research questions. Codes were first developed in NVivo by reading the data line by line, a procedure known as 'open' coding.[64] In the present study it generated several uncategorised codes. For example, each difficulty that a lawyer was said to have with DNA evidence was listed as one code, or a 'free node' in NVivo. These codes were then reorganised into similar themes to generate tree nodes. The process of organising codes in this way, which involves rigorously specifying and organising codes to reflect theoretical core categories, is a form of coding known as 'axial coding'.[65] This is the second stage of inductive coding and results in codes being consolidated, renamed, collapsed and more systematically organised. An example of the axial coding process is represented by the figure of the tree nodes below.

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[61] A criticism of QDA software programs is that technology carries with it certain meanings and divisions of labour. Caution with computer aided coding must be taken because of the influence it has on the way we interpret and apply our own meaning to that information, see Grbich, above n 53, 230.

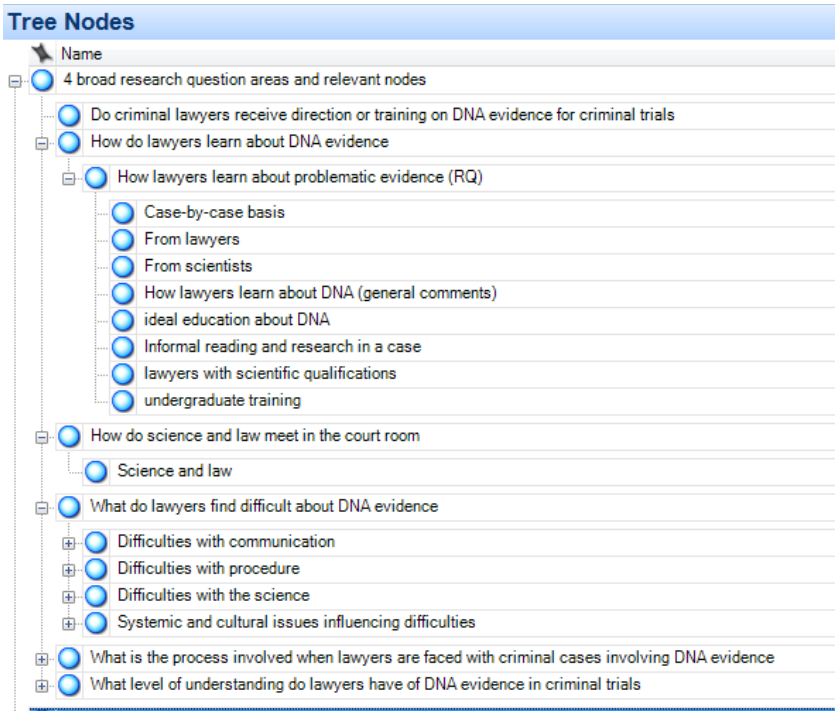
[62] See Chapter 7 on educating lawyers about DNA evidence below.

[63] For the most recent work on grounded theory, see Juliet Corbin and Anselm Strauss, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (Sage, 3rd ed, 2008).

[64] Ibid; Neuman, above n 3; Maggie Walter (ed), *Social Research Methods: An Australian Perspective* (Oxford University Press, 2006).

[65] Corbin and Strauss, above n 63; Walter, above n 64.

Figure 2 – Axial coding: an example of some of the tree node classification in NVivo



Selective coding[66] is the final stage of coding and involves selecting cases that illustrate or contrast with the themes clarified during axial coding.[67]

The development of codes in this way meant the data were analysed thematically by identifying, examining and recording patterns in the research data from open coding through to selective coding.[68] The codes and themes discovered are described in chapters 5 to 7 below.

4.7 Validity and reliability of qualitative interviews and focus groups

One of the common criticisms of qualitative research is that it is 'unscientific'[69] and that the conclusions of one researcher may completely differ from those of another with the same information.[70] Some commentators[71] argue that there is no need to address matters of quality (such as validity and reliability) for qualitative research in the same way as for quantitative research because

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66 McKerchar, above n 5; Neuman, above n 3.

67 Codes and themes are discussed in detail chapters 5, 6 and 7 in more detail.

68 Known as 'thematic analysis', see Virginia Braun and Victoria Clarke, 'Using Thematic Analysis in Psychology' (2006) 3 *Qualitative Research in Psychology* 77, 83.

69 Gray, above n 3, 189.

70 Nicholas Mays and Catherine Pope, 'Rigour and Qualitative Research' (1995) *British Journal of Medicine* 109.

71 See Nahid Golofshani, 'Understanding Reliability and Validity in Qualitative Research' (2003) 8(4) *The Qualitative Report* 597; Alan Bryman, *Quantity and Quality in Social Research* (Taylor and Francis, 2007).

quantitative research pursues a positivist paradigm that seeks only one truth.[72] Reliable and valid research in a positivist paradigm will find that truth. Qualitative research acknowledges numerous truths, that of each of the participants. Golofshani argues that if reliability, validity and triangulation are relevant to qualitative research, they must be redefined to reflect the multiple ways of establishing truth.[73] Having acknowledged this school of thought, however, Gray,[74] and indeed this research, see the value in demonstrating internal validity, reliability and external validity and generalisability to some extent in qualitative research.[75] These matters are discussed below.

4.7.1 Internal validity

Ensuring that the research was internally valid required checking for congruence between the data and interpretations of those data.[76] It is important to note however, that this process occurred within an interpretivist paradigm, acknowledging multiple perspectives of reality and truth for interviewees, focus group participants and the researcher.[77]

Internal validity was achieved in this research by employing several qualitative design measures. The first is in acknowledging the researcher's influence on the research, or as referred to by Goffman, the researcher's 'frame'.[78] The second was keeping a research diary to reflect on the research process. The third was ensuring triangulation of the data and the fourth was checking for consistency in the coding of the data.

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[72] Positivism is a paradigm that sees reality as a single, fixed and measurable phenomenon, an assumption that underlies quantitative research, see Sharan B Merriam, 'Introduction to Qualitative Research' in Sharan B Merriam (ed), *Qualitative Research in Practice: Examples for Discussion and Analysis* (Jossey-Bass, 2002).

[73] Golofshani, above n 71.

[74] Gray, above n 3, 189-190.

[75] In addition to the above approaches to quality and rigour are the checks of transferability, dependability, confirmability and credibility suggested by Thomas M Skrtic, 'Doing naturalistic research into educational organizations' in Yvonna S Lincoln (ed) *Organizational Theory and Inquiry* (Sage, 1985); and see also authenticity as a measure of reliability in ibid.

[76] Merriam, above n 72, 25.

[77] Ibid.

[78] Frames have been defined by Erving Goffman, *Frame Analysis: An Essay on the Organization of Experience* (Harvard University Press, 1974) 10, as the 'principles of organisation which govern social events and the actor's subjective involvement in them.' Extra textual frames are those describing what you've learnt and the knowledge you bring as a researcher; intra textual are internal framing devices such as gender, and culture — who you are; inter textual are those that come from the discipline you are a part of and circum-textual relies on contextual interpretation — the environment in which information or in this case, research, is presented.

Reflexivity

Reflexivity by the researcher is important so that the results, project design and analysis of the data may be defended. Reflexivity refers to the process of challenging a researcher to explicitly examine how their research agenda and assumptions, location, previous experience and personal beliefs might influence the research.[79] The practice of conducting and writing up qualitative research in a self-aware and self-critical way is important for ensuring internal validity in qualitative research. If a researcher understands and projects how his or her own background might influence the interpretation of information, then limitations of a qualitative methodology are reduced. One mechanism for identifying and exploring these assumptions is using a research diary. The research diary kept during this research contained memos on sampling, data collection methods, operationalisation of the research process and analysis strategies.[80] These are typically the areas of research validity that are challengeable.[81] The research diary and memos were used to evaluate and interrogate the approach taken to the interviews and focus groups in this research.[82]

Research diary

Except for the focus groups with forensic scientists and a small number of lawyer interviews, data collection took place over a six-month period during the first and into the second year of research. At the end of each day of empirical data collection, an audio research diary was recorded. Reflections were predominantly about research methods used, research questions, interview questions and how the collection process might shape the overall analysis.[83] There is no single correct method for keeping a research diary[84] and the purpose is to keep a record of the researcher's thoughts and experiences and to develop a reflexive stance.[85]

The use of a digital voice recorder meant that feedback and reflection could be recorded immediately. The sincerity and overall tone of an interview is not obvious in the transcripts of recorded interviews and focus groups. The research diary was often used to provide the researcher's reflections on lawyers' mannerisms or the apparent sincerity or guardedness with which they gave information.

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79 Ping-Chun Hsiung, 'Teaching Reflexivity in Qualitative Interviewing' (2008) 36 *Teaching Sociology* 211, 211.

80 See 4.6.1 for further discussion of research memos.

81 Walter, above n 64.

82 Hsiung, above n 79, 214.

83 Deemed an important aspect of reflexivity by Cynthia Hardy, Nelson Phillips and Stewart Clegg, 'Reflexivity in organization and management theory' (2001) 54(5) *Human Relations* 531.

84 David Silverman, *Doing Qualitative Research: A Practical Handbook* (Sage, 2000).

85 Miles and Huberman, above n 51.

The research diary was also used to process information from the interviews. Changes to the probing questions asked in association with research questions were made in response to the realisations recorded in the research diary. An example of how the research diary influenced later interviews is seen in the transcript of a diary entry:

> Research Journal – 23rd June 2011
>
> So this is my research journal for the 23rd of June, 2011 and it's actually for yesterday. Yesterday I interviewed two people from X. I was supposed to interview X at 10:00 but I'm now interviewing him tomorrow and/or later today depending on how he goes.
>
> First of all, I spoke to X at one o'clock. Now I've realised quite a big difference between talking to solicitors and talking to barristers. So obviously, solicitors take care of matters in Magistrates' Court a lot of the time or they instruct barristers in the Supreme Court. Their involvement in the actual presentation of evidence is quite limited and that meant that some of the questions weren't particularly relevant. For example, how do you explain DNA in front of a jury and the influence that their knowledge has of limitations or of the process on presentation or explanations. It wasn't relevant at all. So, in later interviews I suppose I need to be aware to tailor the questions to the interviewee.
>
> X came into the interview fairly flustered and said "I don't know how long this is going to be. I don't know much about it. I haven't been in a case where the DNA is contentious." It was still interesting to have a chat to him and I think he, and probably others, have more experience than they realise. Not every lawyer is going to have a major and high profile case involving DNA evidence to fall back on. And we ended up still talking for almost an hour about, first, about X and the connections that he has there but also about DNA more generally. And as a criminal lawyer, he has had experience in criminal matters and does a lot of burglaries and other trials and spoke from his experience of being at X where he did murder trials. So, he started off the interview a little bit out of context. It wasn't particularly relevant but then moved into what he thought of DNA, what confused him, where he thinks the issues are and how best to learn about it.
>
> Now communication has been a huge thing through these interviews so far. So, the communication of the evidence itself and how problematic it is when an expert is quite hard to understand. He had had a lot of experience in forensics and said that "you know that has influenced his tendency to talk to the experts". He still talks to the experts and he would also talk to people in the process as well.[86]

[86] Kate Cashman, Research Journal, 23 June 2011.

Questions to barristers and solicitors were adapted because of the research diary reflections on these interviews.

Triangulation and code consistency

The use of different research methods to test the same information is often referred to as triangulation.[87] Methodological rigour was ensured by the use of the four triangulation techniques identified by Denzin.[88] Methodology triangulation is the use of more than one data-gathering technique.[89] This was achieved in this research by collecting data by interviews, focus groups and thematic analysis[90] of secondary data sources, including current legal and scientific education programs, case law and the reviews of process discussed in Chapter 2. Data triangulation was achieved by gathering the same type of data across two jurisdictions (Victoria and the ACT) and with some overlap in the questions directed to those participating in interviews and focus groups.[91] Investigator triangulation was achieved by having final codes checked by a third party[92] to ensure understanding of description and consistency in the information attributed to those codes. This was also achieved during the development of codes with the assistance of supervisors, one of whom was also present during the ACT Supreme Court judges' focus group. Finally, theory triangulation involves the use of more than one theoretical scheme in the interpretation of the data, and in this research, that was achieved by the interdisciplinary overlap between the legal and forensic science disciplines.

4.7.2 Reliability

In contrast to quantitative research, reliability in qualitative research does not focus on the consistency of the results obtained or whether the same research process would produce the same conclusions in subsequent studies.[93] Following the interpretivist paradigm, qualitative research is 'reliable' if the analysis reported is consistent with the data collected.[94] This outcome is inextricably linked to internal and external validity, as triangulation, code checking, and a clear description of the research context and purposive sampling of participants also ensure reliability. Issues with reliability

87 Babbie, above n 2.

88 Norman K Denzin (ed), *Sociological Methods: A Sourcebook* (McGraw-Hill, 2nd ed, 1978).

89 Adela McMurray, R Wayne Pace and Don Scott, *Research: A Common Sense Approach* (Thompson, 2004) 263.

90 Jennifer Fereday and Eimear Muir-Cochrane, 'Demonstrating Rigour Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development' (2006) 5(1) *International Journal of Qualitative Methods* 2.

91 See 4.4 above.

92 This person performed a checking role only and did not engage in data analysis in any form.

93 Babbie, above n 2, 431–432.

94 Merriam, above n 72.

will always arise because people do not always say what they feel and because an interviewee or focus group participant may respond to questions differently on different occasions.[95] Another way in which this research achieved reliability in the results was by ensuring that the research design only allowed for participants to be asked questions that they were in a position to give a response to that might help answer the research questions.[96] For example, given that the lawyers working for government organisations were selected for the study by their managers or directors based on their having experience with DNA evidence, asking questions about that experience was likely to be within the realm of answers that they could realistically provide to the researcher. Because not all interview questions were relevant to all of the participants, interviews could be tailored to the interviewees experiences and they were still able to garner data that were relevant to the research questions.

4.7.3 External validity and generalisability

External validity is achieved, in part, by the extent to which it is possible to 'generalize from the to other cases or situations.'[97] Generalisations are, by definition, assertions of enduring value that may be applied regardless of context.[98] Because qualitative research is essentially contextual — that is sampling is purposive (rather than random) and data are gathered from a small cross section of practitioners — the question remains as to whether results of qualitative research can ever really be generalised.[99] The common concept of generalisability follows on from the positivist paradigm whereby one can generalise statistically from a specific sample to a population.[100] This is almost impossible to do in most qualitative research where there is an in-depth focus and a small number of participants, compared with the entire population from which a research cohort is drawn. The interpretivist paradigm focuses on different interpretations of reality, and thus the concept of widespread generalisations is problematic. If it is essential that research be 'generalised' then the results of one piece of research may be used to build a working hypothesis in later studies,[101] or ultimate conclusions in qualitative research are held to be suggestive rather than conclusive.[102] Merriam suggests that working hypotheses that take research context into account can assist others

[95] Babbie, above n 2, 152–153.

[96] Ibid.

[97] Gray, above n 3, 190.

[98] Merriam, above n 72.

[99] Gray, above n 3, 191.

[100] Merriam, above n 72, 26.

[101] See Gray, above n 3.

[102] Ian Dey, *Qualitative Data Analysis: A User-Friendly Guide for Social Scientists* (Routledge, 1994).

in similar contexts in their decision-making, the 'results of which can be monitored and evaluated in order to make better decisions in the future.'[103]

Considering this definition of generalisability, this research achieves external validity by explaining the legal environment and research context for Victoria and the ACT[104] so that lawyers outside these jurisdictions can still draw insight from the recommendations made in Chapter 7 if similar contexts apply to their own criminal practice.

Validity through participant selection

Although representative sampling was not the aim of this research, internal validity was achieved by ensuring that research participants reflected a broad range of legal and scientific professionals currently working in their respective fields. Interviewees and focus group participants varied in their experience — from lawyers who had been in practice for two to three years with experience of DNA evidence in lower courts to barristers with forty years of practice at the criminal bar running cases in which DNA evidence was the sole and/or most contentious evidence. This ensured that the participants were likely to provide an adequate representation of those either using or interacting with lawyers dealing with DNA evidence in criminal cases.

4.8 Conclusion

This chapter has detailed the research paradigm that underpinned the study and the philosophical framework that guided its research methodology. The rationale for a qualitative research method was given, followed by a discussion of the research questions and general themes considered by those questions. The qualitative research methods were introduced and the process of analysis — preliminary analysis, thematic analysis and coding using QDA software — was presented. The following three chapters discuss the research findings organised around themes identified in the data. The first of these, Chapter 5, sets the scene for chapters 6 and 7. It introduces some common concerns and considerations lawyers identified in relation to dealing with DNA evidence in criminal trials, and that influence whether they experience difficulties with the evidence and their involvement with DNA education.

[103] Merriam, above n 72, 29.

[104] See Chapter 3: DNA in a legal context.

5 The realities of legal practice for Australian criminal lawyers

5.1 Introduction

This chapter explores data on the practical experiences of lawyers in managing DNA evidence. It uses the ethnographic approach applied by Wyatt and also Williams and Weetman[1] to explore and uncover the micro-dimensions of criminal law practice in relation to DNA evidence. To understand the difficulties that lawyers experience in managing DNA evidence (Chapter 6) and the way in which they learn about DNA evidence (Chapter 7) it is important to recognise that there are several experiential and systemic factors that influence lawyers' views about and approaches to using and learning about DNA evidence. Many of these factors are experienced as tensions in lawyers' practice. Recommendations in the *Strengthening Forensic Science in the United States: A Path Forward*[2] report (NAS Report) are based on the assumption that lawyers lack knowledge about scientific evidence like DNA evidence. What that report does not discuss is how lawyers approach DNA evidence in every day practice — the decisions they make, the reasons for those decisions and if, indeed, lawyers do lack knowledge or whether there are other considerations in play which explain why they use DNA evidence in the way that they do. This chapter identifies and discusses six themes that emerged from analysis of the data. These themes focus on the tensions inherent in managing and learning about DNA evidence in everyday criminal law practice. Many of these tensions arise from and are embedded in the adversarial criminal justice process. For this reason, they cannot necessarily be resolved.

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1 Robin Williams and Jason Weetman, 'Enacting forensics in homicide investigations' (2013) 23(3) *Policing in Society* 376. David Wyatt, 'Practising Crime Scene Investigation: Trace and Contamination in Routine Work' (2004) 24(4) *Policing and Society* 443. Williams and Weetman's research viewed daily activities of crime scene examiners and forensic scientists through an ethnographic lens, which is the importance of understanding the 'nature and consequences of organisationally produced and socially consequential decision-making by specific actors' in the context of the use made of forensic science: Williams and Weetman, above n 1, 380. Wyatt refers to this as a 'conceptual reminder' of the need to view forensic science as a whole system, one where forensic science is 'enacted' at specific sites (see Wyatt, above n 1, 443) including the courtroom. Wyatt's research refers to 'micro-dimensions of practice' in analysing the practical experiences of participants. His research studied experiences of crime scene examiners in the United Kingdom and Wales using ethnographic data obtained from fieldwork at one of the country's biggest forensic CSI training providers. Wyatt argues that such research is essential if an understanding is to be gained of how abstract processes are enacted at a grassroots level (at 447).

2 National Research Council Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) National Academy of Sciences <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>.

The chapter begins with a discussion of what lawyers do and do not know about DNA evidence and ends by considering the impact of the realities of legal practice upon lawyers' approach to that evidence.

The six themes that emerged from the data are:

- DNA evidence is common but rarely contentious;
- Contentious DNA evidence: is it the science or the procedure?
- Is DNA evidence exclusionary evidence that rarely excludes?
- Is DNA evidence really 'just another piece of circumstantial evidence'?
- Working on a case-by-case basis;
- Does your 'side' (prosecution or defence) count?

In interviews for this study, lawyers spoke at length about their practical experiences of cases involving DNA evidence. Case types were varied and included the full spectrum of criminal offences from property and drug offences, crimes of personal violence including minor and serious assaults, to sexual offences and murder. Although there was variety in practice, and indeed in the level of experience of the lawyers interviewed, it became apparent that the themes listed above and discussed below applied to most, if not all, lawyers to some degree when working with DNA evidence. For many, the use of DNA evidence requires them to balance notions of 'ideal practice' and systemic or cultural considerations inherent to criminal law practice. Acknowledging that such tensions exist enables an understanding to be gained of the intricacies of daily criminal law practice, particularly in relation to DNA evidence.

The analysis in chapters 6 and 7 is informed by an understanding of the tensions considered here, as they provide information and perspective on lawyers' practical experiences with DNA evidence and their understanding of that evidence.

5.2 DNA evidence is common, but is it contentious?

This issue has implications for the extent to which lawyers may seek to become knowledgeable about DNA evidence and/or investigate or challenge the validity of DNA evidence in cases in which they act. The data obtained for this study reveal that DNA evidence is a common form of evidence in criminal law cases. That finding alone might suggest that lawyers need to have an excellent understanding of this evidence and should therefore engage widely with forensic biologists. What the data also suggest, however, is that DNA evidence is rarely contentious so that although lawyers understand the

importance of having knowledge about DNA evidence, the reality is that the outcome of cases rarely depends on how DNA evidence is collected, analysed and presented.

Several of the lawyers interviewed had over twenty years of practical legal experience and only two of those lawyers had ever experienced more than one case involving contentious DNA evidence. That finding poses a significant challenge to legal educators who aim to involve lawyers in formal DNA education programs that they will view as relevant to their criminal law practice.

At the same time, there is widespread awareness of the serious criticism levelled at lawyers in those rare cases where they have either failed to identify contentious DNA evidence or not handled it well and where it forms the basis of an appeal.[3] Such criticism is exemplified by that contained in the *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (Vincent Report)[4] into the *Jama* case. Although *Jama* is viewed as an exceptional case, the criticisms of lawyers (and others) involved in that case were so profound that interviewees were aware of the report's recommendations.

DNA evidence is very common in criminal cases. For example, L33 noted that the criminal cases in which he has acted have involved DNA 'more than 50% of the time.'[5] Similarly, L35 characterised it as 'a very common form of evidence.'[6] Nevertheless, areas of criminal practice and specialisation often influence the extent to which lawyers encounter DNA evidence. For example, in sexual assault cases DNA evidence often forms a significant part of the brief. This is because evidence of the presence of semen may be adduced to establish one of the physical elements of the charge — that sexual intercourse occurred. Nevertheless, in such cases the DNA evidence may not be contentious. For example, it will not be contentious if the central fact in issue is the presence or absence of consent, rather than the occurrence of sexual activity.[7]

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3 See 2.2 for discussions of case law where DNA evidence was contentious or was the basis for an appeal in criminal cases.

4 Frank Vincent, *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (2010) Parliament of Victoria <http://www.parliament.vic.gov.au/papers/govpub/VPARL2006-10No301.pdf> ('Vincent Report').

5 Interview with L33 (25 July 2011).

6 Interview with L35 (28 July 2011). See also interview with L24 (24 June 2011) who found DNA evidence 'fairly regular no matter what you're doing'; and interview with L23 (8 September 2011) who qualified that 'contentious or otherwise, it's very common.'

7 Interview with L33 (25 July 2011).

Even in non-sexual assault cases DNA evidence is seen as rarely contentious or disputed.[8] Only those interviewees with many years' experience of criminal practice[9] referred to taking part in more than two *contentious* DNA evidence cases in their time practising law. Many of the interviewees had never had an experience of proving or defending a case involving contentious DNA evidence, or where DNA evidence was the contentious element of a case. This is illustrated by the following two quotes. The first is from a lawyer (L3) who has been practising in criminal law for 28 years, with the previous five being in a prosecutorial role. The second (L10) is from a defence lawyer who has been practising solely in criminal law for 29 years. L3 stated,

> I had a trial once, and this was one of the very few times that there's ever been strongly contested DNA evidence in a trial that I've had ... I was a junior in this trial and it's probably 15 years ago.[10]

To the same effect L10 said,

> personally I haven't had any cases where it's been the turning point or [where] the sole issue has been DNA or the main issue has been turning on DNA. [So] my experience to date has been looking at DNA reports [and] trying to understand them ... I haven't had any cases where we had a DNA expert, or where the Crown had a DNA expert. I haven't had any Supreme Court matters where DNA has been that critical.[11]

Statements like those of L3 above demonstrate the importance of being realistic in discussing or making recommendations for 'ideal practice' with respect to DNA evidence.

The fact that lawyers have little experience of contentious or problematic DNA evidence raises questions about whether and to what extent they will be willing or able to invest time in investigating or challenging the reliability of DNA evidence. Their lack of experience contesting DNA evidence is partly due to the fact that DNA evidence is not contentious in the majority of cases. This may be the

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8 See interview with L35 (28 July 2011) who felt that 'there's always DNA coming here and there, and most of the time it's fairly uncontested.'

9 This number is used because L11 had 17 years criminal practice and has been involved with two contentious DNA evidence trials as he states, 'sure, well broadly, I've been in criminal law since [19]97, but my experience with DNA trials is the two we've mentioned; *Forbes* and *Meyboom*. I've come across DNA plenty of times otherwise in matters and they've folded, they haven't proceeded to trial, they've folded by way of pleas of guilty, where we've thought the evidence is overwhelming': interview with L11 (24 June 2011).

10 Interview with L3 (6 September 2011). This is echoed in the sentiments of L14 (28 July 2011): 'Well I've only had one case where I've challenged DNA, it was a rape trial, we were unsuccessful, we had an expert, one of the leading experts. The challenge part of it ran for about a week. I struggled with it greatly.' This is also seen in the interview with lawyer L8 (28 July 2011) who 'is a solicitor and [has] been a solicitor for about 10 years and I don't think I've had a case where there's been — oh no I've had ... one — I've had one case where there was a lot hinged on a mixed sample and so the evidence wasn't challenged.'

11 Interview with L10 (23 June 2011).

case in f sexual assault cases where consent is the disputed fact not identity, or if DNA evidence is not found at the scene, or if a defendant pleads guilty. This does not excuse lawyers from having the knowledge required to challenge DNA evidence when it *is* required and they must know enough so that they may discharge this duty correctly. This issue is underscored by the following quote from L18 who is recognised within the profession as having considerable knowledge of DNA evidence. When asked about the prevalence of DNA evidence in her own cases, L18 said:

> I'm just trying to think … none that have gone to trial where I was involved personally. I've had some inquests where DNA was an issue. I occasionally get briefed to be a DNA advisor on trials where I'm not running the trial myself but I get briefed on a sort of consultant basis.[12]

While L18 has considerable knowledge of DNA evidence based on self-tuition, she has very little case experience involving contentious DNA evidence.

Identifying DNA evidence as a common item of evidence in criminal cases, but one that is rarely contentious is a significant finding because it may provide insight into lawyers' lack of engagement in formal training programs on DNA evidence.[13]

For case management reasons, it is important that trial lawyers devote most of their time to issues that are deemed contentious. From an efficiency perspective, this saves both lawyers' and courts' time and, therefore, also money for all parties involved. For these reasons the prosecution may rely on the defence to give them notice of whether they will object to any DNA evidence. This allows both parties to focus on what is in issue prior to trial; it prevents trial by ambush and the court's time is then focused on matters that are genuinely in dispute.

Defence lawyer L33 said that determining whether or not the DNA evidence is contentious is an important first step for lawyers in criminal cases. If it is not contentious, then lawyers are able to avoid wasting the court's time. Moreover, early identification of the fact that it is in contention enables lawyers to consider and devise a tactical approach to dealing with the evidence:

> I think the first step is ... the ability to identify what is contentious DNA evidence. [This] is a distinctive non-trivial step. So, can you identify cases where DNA is contentious or critical and can you identify ones where it isn't? That's really important. And we shouldn't be having fights about stuff that's not important because it makes us look like idiots and it's just a waste of time. I think that the next step is, is there any way that the force of DNA evidence can be sidestepped? Can we

[12] Interview with L18 (26 October 2011).

[13] See Chapter 7: Educating lawyers about DNA evidence.

> find alternative scenarios consistent with innocence, that don't require us to go head-to-head with the statistics?[14]

If lawyers commonly use DNA evidence but rarely find it contentious then they will make decisions on how much time to spend managing and understanding the evidence, based on this fact. Analysis of the data collected must take this into account, as do conclusions based on those data. The recommendations made in Chapter 8 of this thesis take this practical reality for criminal lawyers into account.

5.3 Identifying contentious DNA: is it the science or the investigative procedure?

Lawyers interviewed for the study expressed divergent views both about the desirability of acquiring knowledge about DNA evidence and about the type of knowledge that should be obtained. Although lawyers acknowledge that DNA evidence is rarely contentious or controversial, many feel that they should know more about it to deal with those situations where it *may be* contentious and to help prevent the occurrence of miscarriages of justice. However, there is no consensus about what it is that lawyers need to know about DNA evidence — whether to spend time learning about the scientific principles involved in DNA testing, or whether to gain an understanding of the procedures involved in collecting, testing and analysing DNA sample. A minority of lawyers said that lawyers should avoid learning about any of these matters and should instead adopt a minimalist approach to acquiring knowledge about DNA evidence to avoid trespassing on the perceived domain of the DNA expert witness. These different viewpoints are discussed in the next section.

5.3.1 Scientific understanding

Many interviewees emphasised the necessity for lawyers to understand both the science of DNA evidence and the scientific principles involved in DNA testing and analysis. The discussion of this matter begins with a group of lawyers who reflected on their lack of scientific understanding of DNA evidence and the implications of this for the cases in which they act. A typical acknowledgment of lack of such understanding was made by L3:

> it is complex so in the end you're dealing with evidence that as a prosecutor you might find very difficult to understand yourself. … I've got a science degree, so some of the things are less foreign

[14] Interview with L33 (25 July 2011). L33 went on to add, 'the next thing you need to do would be aware of is how does the DNA evidence interact with other evidence in the case. It's unusual if not unheard of for it to be just a stand-alone bit of evidence that has no more context. Does the existence of the DNA evidence render other facts more or less likely? Are there other facts that are not necessarily contentious which might fit into the way that we look at the DNA evidence?'

> to me than they would be to others ... but still I can't pretend to understand how it all works scientifically.[15]

Similarly, L14 also questioned his own understanding of DNA evidence:

> I've never really understood what I could really do with it in defence, I don't understand the science well enough, and every time I get [a case with DNA evidence] I have to read [up on it] again because I don't really get it, and I forget it ... my brain's only big enough to hold a certain amount of information at one time I think.[16]

The lawyers who gave this not uncommon response perceived their lack of scientific understanding to be problematic for a number of reasons. Some lawyers reasoned that if they did not understand the science, then neither would the jury:

> but I tell you if I don't have an understanding of the science, and I don't really understand it, [then] the jury don't really understand it either.[17]

Other lawyers said that if a lawyer does not have adequate knowledge of DNA evidence, there is the possibility that the jury will misunderstand it or misapprehend its probative value because lawyers will not be able to question experts meaningfully or elicit accurate and informative evidence to present to the jury. This concern is exemplified by the following quote:

> Unless you know about the science you're not going to get why that's the right question or whether you're getting the right answer.[18]

Despite the prevalent view about the desirability for lawyers to understand the science of DNA evidence, some lawyers expressed a contrary view and advocated for an avoidance strategy. That is, to avoid acquiring an understanding of both the science of DNA and the procedural or scientific method involved in collecting, storing and analysing DNA evidence.

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15 Interview with L3 (6 September 2011).

16 Interview with L14 (28 July 2011).

17 Interview with L24 (24 June 2011).

18 Interview with L30 (20 June 2011). Also see interview with L32 (22 June 2011): 'the only way you can ask somebody about what they've done is to have some understanding as to how and why' and 'if you've got no idea about DNA it's just here's a sample and here's a number and you don't know how you get from sample to number or what it means then you've got no — you can't just stand up and say it must be wrong because that's like saying the sky's falling down. You just do a "climate deny" or whatever, what you're working ... So a lot of lawyers just don't understand why the number and how the number. I think a lot of people have dabbled in dealing with those cases do have the knowledge because you [would] be too scared to get into it at all if you didn't know what you were doing then you would be being a bit negligent running that sort of case without any idea as to what you're going to say.'

As seen in the quotations in the paragraph below, lawyers gave different reasons why having the most basic information on both the science of DNA evidence and the forensic, investigative procedures employed for DNA evidence is the 'safest' way to deal with experts and their evidence. The reasons for avoiding an acquisition of more than just the basic knowledge of DNA evidence included avoiding becoming confused, and that it may lead to a failure to ask the more basic questions of experts in front of the jury:

> So what I do is, I try not to understand the science because then I get confused by my knowledge of the science.[19]

> I think it's a two-edge sword ... I mean I've done enough DNA cases that I know the science behind it, although I don't know *all* the terms and I can't conceive of extraction processes and things like that ... Sometimes you're better off just not understanding it ... Because then when they say, this matches that, the next question [to the expert is] how do you know that?[20]

Another lawyer who eschewed an understanding of the science felt that the more he understood about DNA evidence the more he realised he should remain ignorant of the science:

> I don't try and understand scientific background. I suppose I have a basic understanding of [the science], but [the more I know the] more it convinces me that [the experts] know what they are talking about ... I really do not try to understand the science of it.[21]

L3 felt that a fellow member of the Victorian Bar knew 'too much' about DNA evidence and was critical of her self-education in this area:

> She showed herself to have this amazing knowledge of DNA. She just seemed to have read everything and to understand all this stuff ... And what that meant was that she was trying to challenge the experts as though she was their equal and that wouldn't have worked in the minds of the jury because she was just a barrister. What knowledge she had, which was quite impressive, was stuff she'd just read in [a] book. She wasn't an expert. And I always thought I would have loved to have known what she knew, but the fact is, she wasn't in a position to be able to use it effectively because she would have just come across as a smartass and someone challenging these PhDs and these geniuses.[22]

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[19] Interview with L29 (22 June 2011).

[20] Interview with L29 (22 June 2011).

[21] Interview with L25 (8 September 2011). See also interview with L30 (20 June 2011) who said that '[a]nd I don't really understand — I mean I don't understand how the DNA stuff works in the sense of the locis ... and I don't understand how DNA itself works so I thought I don't need to actually understand what DNA is I just need to try and understand the processes that give it significance.'

[22] Interview with L3 (6 September 2011).

The implications of these views for improving lawyers' competence in dealing with DNA evidence and the appeal of education programs for them, may be that some will continue to have difficulties with this evidence; some will be willing to participate in further education and some will see such programs as irrelevant or problematic. How they approach the latter will depend on their attitude toward what they perceive to be the possible consequences of gaining scientific and procedural understanding.

5.3.2 Understanding investigative forensic procedures

Important for many interviewees is an understanding of the forensic procedures used in the collection, analysis and storage of DNA evidence (the so-called chain of evidence). Contamination and procedural errors in cases like *Forbes*, *Meyboom* and *Jama* discussed in Chapter 2[23] demonstrate that it was not errors in scientific analysis per se that led to the contentious issues that arose in those cases (rather than the scientific principles alone).

Some lawyers interviewed for this study did not feel that they were equipped to challenge potential errors in the chain of evidence or in the testing and analysis phase of DNA evidence in the laboratory:

> I think the other problem is [that] there are some problems with DNA [that] can't be detected from a file, particularly cross contamination and transference and an expert won't be able to read that in the subpoenaed notes. You have to think a bit creatively about whether that's possible or not and it's difficult and I don't know how it is you're supposed to raise the possibility of something which may or may not happen. Like what if Jama did want to say there was contamination, well he at least had the timing issue of the overlap, but timing won't get you there, generally speaking I would have thought.[24]

Although some lawyers (like L18 quoted above) mentioned the difficulties of uncovering contamination in cases like *Jama,*[25] the data from lawyers and forensic scientists suggest that lawyers are actually very much aware of how contamination and transference might occur. For example, L6 stated:

> I mean, they need to look at continuity; [they] need to look at … contamination. They need to look at how the analysis was conducted and understand that for themselves — how the experts … have analysed the piece of evidence and how they've arrived at their conclusion and be able to explain

[23] *Aytugrul v The Queen* [2012] HCA 15; *R v Whyms* [2012] ACTSC 7; *R v Meyboom* [2011] ACTSC 13; *R v Hillier* [2010] ACTSC 33; *R v Forbes* [2009] ACTCA 10 and *R v Jama* [2008] VCC 0886.

[24] Interview with L18 (26 October 2011).

[25] *R v Jama* [2008] VCC 0886.

> that to the jury, because obviously if it's important then they need to understand … the whole process to make sure nothing has gone wrong.[26]

Similarly, L 12 said:

> It was as simple as not bothering to wash their bench tops; it could not be more elementary ... it's a simple lesson to us all that there is the potential for something so basic in any given case [to go wrong], and so the accused who looked so incredibly guilty almost exclusively because of the DNA profiling evidence [is innocent]. When they keep saying it wasn't me, that's possible. And the capacity for otherwise sensible and responsible people to make fundamental errors and do stupid things is remarkable and we all know that from our personal lives.[27]

Transference is also understood by lawyers and they spoke to the importance of ensuring that secondary transfer has not occurred, as reflected in the comments of L33:

> The significant part of the evidence was the extent to which and the circumstances under which DNA could persist on an object and be transferred from object-to-object ... One of the limitations of DNA is the transferability and I've seen more and more examples of practitioners trying to attack the physical properties rather than the statistical properties. With some success.[28]

Lawyers discussed both contamination and transference in many of the interviews and acknowledged that both of these events occur because of human error. Lawyers were aware that although the science is robust, humans play a role in the collection, testing and analysis of DNA evidence. Understanding 'the capacity for humans to err'[29] is a key competency for criminal lawyers.

Another lawyer stated that the errors of contamination and transference are now more likely with the use of smaller samples detected using modern technology because the 'more sensitive the sample, the more compromised it may potentially be.'[30] Although the technological and scientific

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[26] Interview with L6 (7 September 2011).

[27] Interview with L12 (8 September 2011). Also see interview with L18 (26 October 2011) when asked about the limitations of DNA evidence 'that DNA evidence is microscopic, that it can be transferred without people seeing it, that transference can happen very easily. You can't tell a contaminated sample from a non-contaminated sample, I could go on and on, there's a whole lot of things which people accept. If I pick up this pen and I pass it to someone else and they pass it on — there's all sorts of combinations that might appear on that pen. Some people might appear and some people won't appear.'

[28] Interview with L33 (25 July 2011). Also see interview with L39 (7 September 2011): 'the other thing ... is transference'; and interview with L8 (28 July 2011): 'limitations in terms of ... continuity or any sort of innocent transfer.' See also interview with L18 (26 October 2011).

[29] Interview with L4 (25 October 2011). See also interview with L12 (8 September 2011), '[w]ell there have been some extraordinary examples of human error, and mixing this up, and contamination of one sample with another and just poor work.'

[30] Interview with L7 (28 July 2011).

breakthroughs have been considerable, these breakthroughs lead to smaller and more easily transferred DNA traces being collected, tested and later used as evidence in criminal trials.

The statements quoted above and those footnoted demonstrate that lawyers understand the risks associated with human error including contamination and transference. They understand that both threats must be considered before the veracity of the DNA evidence can be assured. The problem in practice, therefore, is how to apply this understanding to individual cases. In *Jama* for example, lawyers may have had an understanding of contamination and transference in a general sense, but a miscarriage of justice still occurred because of the failure to uncover that this had happened.

Accordingly, there is a gap between having an understanding of problematic forensic procedures and exposing their existence in individual cases. The *Jama* case is a good example of this. While, lawyers may not be able to remove this risk completely in every case, they can make decisions about acquiring relevant knowledge to help prevent the occurrence of future miscarriages of justice.

The provision of biology files[31] to lawyers in cases where DNA evidence is a significant component of the prosecution case may help to close this gap. This measure will not be effective, however, if lawyers do not understand those files. Further, there may be a tension between providing information that is comprehensible to non-scientists and legal professionals and presenting adequate scientific information to demonstrate the reliability and strength of a DNA evidence result. This tension may be one that is hard to resolve and that should not, in any event, be resolved in a way that undermines the integrity of scientific documentation. Ideally, at least, lawyers should to be able to subpoena biology files in cases where the DNA evidence might be more contentious. This would mean, at the very least, that they may have more information on the DNA evidence in their cases and that they may be better placed to identify potential problems with it. Having access to a report or biology file before talking to an expert or challenging the evidence in court would also facilitate case preparation and knowledge acquisition before trial.

A number of lawyers commented on the importance of questioning how the DNA was deposited and how the evidence was collected and later how it moves through the chain of custody. For example, L25 said,

> I go back and have a look at the chain [of custody and make sure it] is not broken and is intact and that there is no prospect of the corruption of the samples. I like to be able to work that out from

[31] Biology files comprise all testing and results information, notes from forensic biologists about samples and the analysis process and any information from statisticians or others involved in collection, storage, analysis and interpretation of DNA evidence results.

> the material I've got ... [For example] this constable took it and then this one put it in the locker, or put it in a sealed bag and it went in a locker and the next person came ... so [try to trace] all the way back [un]til it is tested to show that the sample doesn't get corrupted.[32]

Such statements indicate that lawyers are clearly aware of the chain of custody and the importance of ensuring the integrity of DNA samples. *Jama* tells us that unless lawyers both have that awareness and exploit their knowledge of these matters, there remains the risk that miscarriages of justice may occur. The lawyers in *Jama* did not investigate how the DNA sample was taken nor uncover how Jama's DNA came to be placed on the database. In contrast, lawyers like L25 and those footnoted above[33] investigate the chain of evidence and likelihood of transference. This approach may, of course, have been a result of what occurred in *Jama.*

Overall, lawyers' knowledge of DNA evidence appears to be relatively sound — most lawyers can explain what DNA is, how the testing takes place and what DNA evidence can be used for. The tension that exists for lawyers in criminal practice though is deciding whether they need to understand the science of DNA evidence in more detail or devote their time and continuing legal education to gaining a deeper understanding of the forensic procedures used and the chain of evidence. Interviewees had an understanding and awareness of contamination and transference. Nevertheless, *Jama's* case demonstrates that the ability to uncover contamination and transference goes beyond merely knowing what contamination is or that transference can occur easily. It requires the right questions to be asked of forensic scientists and the forensic process.

5.4 Is DNA evidence exclusionary evidence that rarely excludes?

The research explored the extent to which lawyers understand the nature of DNA evidence as exclusionary evidence. DNA evidence does not create 'conclusive matches' between DNA profiles of known samples to other samples on a database. All it can do is either exclude individuals, or not

[32] Interview with L25 (8 September 2011). See also comments from interview with L31 (28 September 2011): 'I basically, I follow the chain a lot, and I'll physically write it out or follow the chain of statements. And we'll put the statements side-by-side and go okay so SP1 that day goes from there, okay that goes there, puts it in the safe, gets it out of the safe, takes it to there. So it's just by analysing the statements. And I've certainly had to do that at least two or three times in the past.' Also see comments in interview from L35 (28 July 2011) who has a degree in science combined with law, '[f]irstly look at the item that the DNA is allegedly found on, is it transferrable? Look at the amounts, whether it's trace amounts, whether it's copious amounts, look at the profile itself, whether it's a straight profile or whether it's a mixed profile. And if it's a mixed profile look at the varying quantities on the electropharagram. So it could be that any DNA profile that's attributable to your client may be the minor contributor and there maybe another person out there who is a major contributor. That could always be if that's a victim. Then yeah that's fine. So if it's copious amounts of blood at the point of entry I think you can sort of quietly infer ... That's a pretty good DNA profile there from whoever it may be.'

[33] See above n 27.

exclude individuals based on the loci tested. If they are not excluded, the probability ratio can present how much more likely an observed DNA profile would be if it came from the defendant or someone on the database than if it came from a random person. The majority of lawyers interviewed understood this aspect of DNA evidence but queried whether it could still be referred to as exclusionary evidence. Their concern was, in part, due to advances in technology and more specifically, mixed profiles becoming more prevalent in the swabs of DNA taken from crime scenes. The sensitivity of the technology means that fewer people are able to be 'excluded' from being contributors in a DNA sample that is found at a crime scene. Mixed profiles allow for a greater number of possible combinations of the loci tested in samples being present — and, accordingly, more people fall into the mixture than if it were a single DNA profile.

Defence lawyers referred to the exclusionary nature of DNA evidence more frequently than prosecutors. Prosecutors expressed frustration that defence lawyers rely on a proposition that with the increase in mixed profiles their clients may not have been responsible for crimes because of the chance that another member of the population could not be excluded from contributing to the DNA sample that was found at a crime scene. More often than not, defence counsel made, and stressed, the distinction between inclusionary and exclusionary results. Defence lawyers focus on exculpatory evidence as a matter of course and thus tend to concentrate on the use of DNA evidence to exculpate their clients by using the exclusionary nature of DNA evidence to eliminate or erode its significance as inculpatory evidence. This presents issues for some prosecutors who have difficulty accepting that DNA evidence never really excludes the possibility that the perpetrator might have been someone other than the accused.[34] L23, for example, expressed frustration about this stating, 'it's exclusionary and not inclusionary ... [but you] can never really exclude that there was somebody else [involved].'[35]

The increasing use of mixed profile DNA evidence in criminal trials has made the exclusionary concept of DNA evidence more problematic for lawyers because with so many 'potential' contributors, a defendant may never really be excluded. In this regard L30 noted,

> Well more and more it doesn't [exclude people] because of the way that they interpret it ... more and more you're getting multiple contributors. So they'll say well it could be him and he's contributed these [but] it could be somebody else who's contributed those, so he's not excluded. So the exclusions are happening less and less because of the way that almost always you're doing the samples with multiple contributors not sole contributors.[36]

[34] Interview with L23 (8 September 2011).

[35] Ibid.

[36] Interview with L30 (20 June 2011).

Lawyers have come to understand that DNA evidence is exclusionary rather than inclusionary and they feel relatively comfortable using the evidence in this way. However, the changing technology used in DNA testing is undermining this confidence because in situations where a person may previously have been excluded from a DNA sample, they may not be excluded based on a mixed profile. This illustrates one of the difficulties of using and relying on scientific evidence like DNA in a legal setting — the technology will always be changing and lawyers find themselves trying to keep pace with that change.

5.5 Is DNA evidence really 'just another piece of circumstantial evidence'?

A tension arises from the fact that although DNA evidence no longer has the air of infallibility that it once had in criminal trials, it may still be treated differently to other types of circumstantial evidence. This section discusses a number of themes relevant to this tension. It begins with the argument that DNA evidence should be treated no differently to other circumstantial evidence. Second it considers lawyers' views on the limitations of DNA evidence. The gaps in the information provided to lawyers about the chain of evidence and the details of the forensic processes used are then discussed and finally, the influence of DNA evidence on the decision to prosecute is examined.

Lawyers spoke of a decline in the perception of DNA evidence as an extremely important and persuasive item of evidence, to 'just another piece of evidence', of similar weight to other circumstantial evidence in criminal trials. They attributed this shift to a recognition that there have been cases where miscarriages of justice have occurred as a result of too much trust being placed in DNA evidence. L1 illustrates this point:

> well that's the problem with DNA, that it was the be all and end all, but now we can see there are cases in the United Kingdom and others that are unravelling because of all these issues about contamination, cross-contamination, how it was gathered, etcetera, etcetera.[37]

One of the implications of the view expressed in this quote is that it is important to assess DNA evidence in combination with other evidence presented at trial. However, many lawyers interviewed suggested that the presence or absence of DNA evidence is still viewed as pivotal. For many, DNA evidence is seen as being more than 'just another piece of circumstantial evidence.' Evidently there is a tension between, on the one hand, DNA being viewed as just another piece of circumstantial evidence and on the other it being treated as more persuasive than other evidence. Of course, these perceptions may be influenced by the fact that if DNA is the only probative evidence available to the

[37] Interview with L1 (23 June 2011).

prosecution in a particular case, great weight must be attached to it if it is to establish the defendant's guilt:

> technically it might be the only evidence you've got. Yeah it can persuade you, of course, if you have a light-on circumstantial case and you've got that extra bit of evidence that's confirmatory by way of DNA. It can certainly tip the difference between prosecuting or not ...[38]

Lawyers understand that DNA evidence can be very persuasive in a courtroom. Because of this, many lawyers use DNA evidence to their advantage and tactically approach a trial with DNA evidence in mind:

> I think prosecutors treat it as powerful evidence, which it is and evidence that juries are attracted to and I know that prosecutors get frustrated with what they see as a CSI effect, which is jurors' acquitting when there's no DNA or when it's not really likely that there would have been DNA. So they get frustrated with defence lawyers capitalising on the absence of something which is not that much of a big deal.[39]

This quote acknowledges the unusual power of DNA evidence and the CSI effect, discussed in Chapter 3.[40]

For defence counsel the presence of a strong DNA result that links their client to the crime or the crime scene can restrict the possibilities for defending the case:

> DNA often cuts off a lot of opportunity for creativity in defence. It really does, it knocks it stone dead. You often just can't get around it. You've often just got to say, "well yes he bled on the carpet. It's his blood on the carpet so other than the fact that if one of the inhabitants of the house has worked at the blood bank and had the person's blood in their" … well it doesn't work does it. So blood on the carpet means well, yes my client has been there and bled on the carpet. Then the focus becomes [wider] — was he there for a lawful reason? Was he there as an invitee? You know was he there for another reason other than the crime as charged?[41]

As a defence lawyer, L19 argues, DNA evidence has significance in a number of ways:

> [it's] crucial for both sides, because if they haven't got it then it gives me much more, in defence. If the prosecution haven't got it, it gives me in defence much more scope for creativity. If I'm

[38] Interview with L15 (7 September 2011). Also see interview with L22 (20 June 2011) who stated, 'without the DNA we've got next to nothing, with the DNA we've got a good case.'

[39] Interview with L18 (26 October 2011).

[40] See Chapter 2.2.2 for further discussion of juries, DNA evidence and the CSI effect.

[41] Interview with L19 (26 July 2011).

> prosecuting and I have it, it means that I've cut off any lines of exploration and confusion that the enemy might try and use. If you haven't got DNA you can bet your bottom dollar that the defence will say, well they haven't got DNA, they haven't got this and they haven't got that, and their case is hopeless. You shouldn't believe a word that is said by this witness and they've got no supporting evidence — acquit. That's how it works.[42]

These statements indicate that the presence or absence of DNA evidence can provide a tactical advantage to one side or the other in a way that may not apply to other circumstantial evidence.

5.5.1 Limitations of DNA evidence as circumstantial evidence

Whether lawyers view DNA evidence as essentially unproblematic and implicitly reliable will determine how they deal with it and the extent to which they may test its probative value and reliability. Participants in the study were asked to identify and explain what they perceive to be the limitations of DNA evidence. The aim was to uncover whether lawyers understand the accepted limitations of DNA evidence, or whether they see DNA evidence as 100% certain and trustworthy in every case.[43]

One of the interview questions focused on whether lawyers believe DNA evidence to have any limitations. This aimed to explore the emphasis that lawyers place on DNA evidence and whether it is in fact, just another piece of circumstantial evidence.[44] Many answers were insightful and suggest that lawyers, on the whole, are more discriminating than previous research would indicate.[45] This suggests that although lawyers rarely challenge DNA evidence, or feel that they don't understand it sufficiently, this is not necessarily because they don't understand that it has limitations, or how it may be used or relied on.[46]

Many lawyers made the point that DNA evidence can only explore questions of who may have committed an offence, not how an offence was committed or the chain of events thereafter. As L8 said, 'well DNA will only explain or attempt to explain the origin of the sample and it won't explain how the sample got where it's said to be.'[47]

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[42] Also see interview with L22 (20 June 2011) who stated 'so there is no direct evidence that he's [been] there [and] without the DNA we've got next to nothing. With the DNA, [however] we've got a good case.'

[43] See discussion of Veth et al's research in Chapter 2.2.1.

[44] Interview question 2C, Appendix F.

[45] See Chapter 2.2.1 for a discussion of the previous research on lawyers and DNA evidence.

[46] Possible explanations for lawyers' failure to challenge DNA evidence is explored further in Chapter 6.

[47] Interview with L8 (28 July 2011). See also interview with L17 (27 July 2011): 'well it can only tell us that that DNA material is that DNA material. There are assumptions around that and that's probably where the danger

DNA evidence may assist in those enquiries, but it cannot prove all elements of a crime. Focus group participant FS2 pointed out that a DNA sample and result does not explain how the trace appeared at the location where it was found.[48]

One lawyer expressed doubts about basing a prosecution solely on DNA evidence:

> There's no doubt from a prosecution perspective DNA evidence is very helpful, but as I said the real issue with DNA evidence really comes about when you have little or no other evidence — what is the evidential implication? Because in the majority of cases DNA evidence is not used as the linchpin of a Crown case. It's simply to buttress the case, the inferences that you seek to draw. So, it's really kind of just one strand. But the real issue in my view comes from when you have no other strands or one very tenuous or weak strand. How can you rely on DNA evidence in that case to have a jury infer guilt from just that item only or that piece of evidence only?[49]

This lawyer felt that DNA evidence can be of fairly limited use if it is the only item of evidence from which to infer the guilt of an accused. Further, this may potentially cause a miscarriage of justice. The Victorian Office of Public Prosecutions has recognised the danger of relying on DNA evidence alone and has introduced a requirement for prosecution counsel to obtain the approval of the Director to proceed in cases where the only evidence against the accused is DNA evidence.[50] This demonstrates an understanding that DNA evidence is not treated like other circumstantial evidence. Generally, one item of circumstantial is insufficient to ground a reasonable prospect of conviction (the test applied to determine whether a case should proceed to trial). Unlike other circumstantial evidence, DNA evidence alone *can* be considered to satisfy this test, subject to the qualification in Victoria that the Victorian Director must give approval for the case to proceed.[51]

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lies ... the limitation is what you do with that information'; interview with L2 (21 June 2011): 'it can't tell you when the DNA was put there'; interview with L16 (7 September 2011): 'but it just says they've touched it ... the question may be what [the] intent was'; interview with L31 (28 September 2011): 'all it can tell us is who's been where and who's been near and/or touched what, and who, etc. It doesn't tell us any more than that'; interview with L32 (22 June 2011): 'It may show the person's DNA was in that location. It doesn't now necessarily mean that person was in that location.' Also see interview with L35 (28 July 2011): 'you can't put a time on it. So you don't know when that DNA was deposited.'

48 Focus group with FS2 (4 June 2011).

49 Interview with L6 (7 September 2011).

50 Interview with L26 (8 September 2011).

51 See *Forbes v The Queen* (2009) 167 ACTR 1.

5.5.2 DNA evidence as 'conclusive'

DNA has been viewed by lawyers as 'certain' and conclusive,[52] yet they are aware that they cannot use the word 'conclusive' to describe it. The lawyer quoted below admitted to using language that is almost conclusive, but acknowledged the tension here because he began by explaining that DNA cannot ever be explained by way of a 'match':

> Yes, you can't talk in terms of a match and you are prohibited from talking in terms of a match in court. You will never ever, ever hear 'match' being talked about, "it's his DNA". All you can ever say is that the likelihood ratio is so high that it excludes, for all intents and purposes [all other people in the universe] … As a prosecutor, I think I've used "has to be him" and I don't think I've got in trouble and the defence can't materially argue against that. You can never say that it is his blood; you can never say that *is* …[53]

Many prosecution lawyers and a smaller number of defence barristers interviewed had spent time with forensic experts in preparing cases and learnt that even a probability ratio that was greater than the population of the planet, for example 1 in 10 billion, did not necessarily mean that there could never be two people with the same DNA profiles on the same loci on the planet, or even in the same city:

> Yeah, I don't like it as opposed to not understanding [it]. The figures I have doubts about ... You know the notion that, taking events at random, [the probability ratio might be] 1 in a billion or something. Even the statisticians tell you it doesn't mean that there isn't somebody else [with the same DNA profile] or that there aren't 10 people within the range. That to me is an enduring weakness that you'll never be able to fix.[54]

The discussion above suggests that lawyers acknowledge the persuasiveness of '1 in 10 billion' as a probability ratio, particularly if there is no further exploration, with forensic scientists, of what those

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[52] See Veth et al's research in Chapter 2.2.1.

[53] Interview with L19 (26 July 2011). L16 (7 September 2011) also suggested that 'the proper answer to that is, well a flying pig's possible but I've never seen one, just because I haven't seen one doesn't mean it's not possible. So it's that sort of thing a proper person would say now look, all things are possible, Elvis Presley may still be living, but I haven't seen it happen and I cannot understand how it would happen, this makes it very hard for them and you can't dictate to the witness how they're going to answer that.'

[54] Interview with L34 (6 September 2011). Also see interview with L22 (20 June 2011) who also felt that this was a limitation: 'well the biggest limitations are the sort of things, the fact that it's not absolute evidence, in a sense that you know, it does not, it's the probability that is them rather and I understand, and I haven't really got to the bottom of it, but when you calculate the probabilities you are not necessarily talking about, there's been some studies that talk about how many people are involved in getting to one in a million, how many cross matchings are referred to in one in a million and I think it's not a very large number of people, it's like eighteen thousand or something like that?'

terms mean. Some defence lawyers do talk to forensic scientists so that they are able to expose what ratios like this mean, but this is unusual.

Lawyers also felt that a limitation of DNA evidence is that experts may have to concede that certain propositions are 'possible' because nothing is 'impossible'. This is the nature of probability evidence and so it applies to DNA evidence. Nevertheless, lawyers have expressed a desire for forensic scientists to 'give in' and say that a sample belonged to an accused person with 100% certainty.[55]

5.5.3 Exposing deficiencies in investigative procedures

One of the lawyers interviewed did not believe that lawyers should consult experts if they could understand the forensic reports themselves. L4 compared this skill to the skills required in reading a witness statement and evaluating any file in detail. In his view the skills involved in the latter task are no different in cases involving DNA evidence where the results of testing and analysis are routinely provided by forensic biologists in the form of a comprehensive forensic report:

> This [the DNA] is just evidence. It's no different to a witness statement ... [T]hat means just going back, … sitting down and saying, right, give me the file. Look through it yourself. What's missing? Have a basic understanding. Check the statements. Is the sample that was taken from my client, my client's sample? Is the sample that was taken from the crime scene, well that was matched against my client, the sample that was taken from the crime scene? That's just chain of evidence. It's got nothing to do with DNA. What does the file say? How many times was it tested? Is there something scrawled on the file saying "*contamination"*, as there will be if they probably conducted re-testing. Was it re-tested?[56]

Although this statement suggests that there should be no need for lawyers to speak to forensic scientists if they can understand forensic reports, forensic scientists take a different view and maintain that lawyers have much to gain from involving experts in the preparation of cases. It helps them to present the DNA evidence effectively in court and to question experts thoroughly. It is their view that unlike many other types of evidence, DNA evidence may take considerable time and effort to understand.[57]

If lawyers wish to obtain information about the procedures involved in collecting, storing and analysing DNA evidence, then it is important that they understand that they may go beyond the forensic report that is provided and ask for disclosure of the forensic biology file. This typically contains

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[55] See the research of Victoria Grace et al, *Forensic DNA Evidence on Trial: Science and Uncertainty in the Courtroom* (ISCE Publishing, 2011).

[56] Interview with L4 (25 October 2011).

[57] Focus group with FS3 (25 October 2011); Focus group with FS7 (25 October 2011).

the notes that were taken by a forensic biologist from the moment the sample was collected or received at the laboratory, and includes information on decisions that were made during forensic analysis processes. The information a lawyer may need to challenge the investigative procedures applied to DNA evidence is not included in the forensic report, but may be contained in the forensic biology file. Only the report is routinely provided to lawyers. This means that often defence counsel will be required to subpoena the forensic file to gain access to this information. L17 stated that forensic reports themselves contain little information about investigative procedures:

> they need to know what counsel should be provided with to be made aware of the processes that were gone through to come to those results. I think that's really what it comes down to for us and making sure if police don't provide it, then it's either requested or subpoenaed from forensic science and if there's any question about those results, then getting an independent expert to have a look at it.[58]

5.5.4 Decision to prosecute

It is trite to say that the decision to prosecute is of critical significance. Accordingly, it is important to understand whether and to what extent that decision is influenced by the presence or absence of DNA evidence. This is underscored by the fact that the decision to prosecute Jama on the basis of DNA evidence alone was particularly criticised in the Vincent Report.[59] The data reveal a variety of attitudes to the significance of DNA for the decision to prosecute. What is evident is that both the seriousness and nature of the offence and the strength of the DNA evidence in question[60] influence this decision. In relation to less serious offences, a mixed profile generated from a small sample of DNA evidence found outside the area of a crime scene is unlikely to support a decision to prosecute. Similarly, a single DNA profile with a high likelihood ratio attributed to an accused as the most probable contributor in a serious rape trial, with a sample of semen taken from inside the victim's body is more likely to support a decision to prosecute. These considerations are discussed below.

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[58] Interview with L17 (27 July 2011). L17 went on to add, 'no that's an absolute starting point and even though they take a while to come in, it's really important to get the whole lab file because sometimes tests have been done over and over again and there's correspondence between people saying I think this isn't right, what happened here. It should all be provided, not just a sanitised version of this is what happened at the end after a bunch of emails from the informant and the lab and supervisors within the lab. You can see where processes haven't been done correctly and they've had to be done again.'

[59] Vincent Report, above n 4.

[60] For example, the size of the sample collected at the crime scene, the strength of the likelihood ratio generated and whether the profile generated is mixed or a single profile will all dictate how 'strong' the DNA evidence is.

When there is only DNA evidence and no other circumstantial evidence, L25 felt that the inherent strength of DNA evidence is such as to warrant prosecution.

> I'm trying to think if I've prosecuted, I can think of two cases where I've agreed with the prosecution just on the basis of DNA. We didn't have much else and so I have gone on the basis of DNA because it's fairly strong. If the science is correct — and that [question] for me is just an article of faith. I accept that the science is correct, until such time as the courts turn around and say it's not acceptable. I just proceed on the basis that it's right.[61]

Nevertheless, it was acknowledged that a case like *Jama* is very rare — where there was only DNA evidence at the scene and no other evidence to suggest the guilt of the accused. As noted above, in response to the Vincent Report, to prevent such a miscarriage of justice from happening again, the Office of Public Prosecutions in Victoria has instituted a process whereby the Director must approve any case proceeding to trial based on DNA evidence alone.[62]

The lawyer quoted below (L9) believed that the presence of DNA evidence influenced the decision to plead more than the decision to prosecute, because DNA-only cases are rare:

> I think it would have more of an effect on the decisions to plead than decisions to prosecute. I mean it's very rare that you would find a case that you'd only have DNA and you decide to prosecute. I mean it just wouldn't happen. I mean *Jama* was Ethiopian or something… He was in a singles female middle-aged nightclub. Seven-foot-tall and with CCTV and there was not one black man [seen] in that place on that night, [by witnesses or on CCTV footage]. So, it was just a disaster, and it was a disaster [more so because of the lack of] sterilising procedures of the night before. The fact that he'd had a medical officer examine him the night before ... The odds of this happening is billions to one.[63]

As might be expected, it may not be the presence or absence of DNA evidence per se that influences the decision to prosecute, but rather the perceived strength of that evidence, its probative impact on the case in question and the seriousness of the offence:

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61 Interview with L25 (8 September 2011).

62 Interview with L26 (8 September 2011).

63 Interview with L9 (7 September 2011).

> Yes, it does come into it, it either strengthens the case or weakens the case. If the DNA is inconclusive and there is iffy evidence then I am probably less likely to authorise a prosecution. If the DNA is strong, that would influence me in making the decision to sign an indictment.[64]

The presence of DNA evidence in addition to other evidence however, can certainly bolster a case and satisfy the reasonable prospect of conviction test that is applied.[65]

In answer to the question whether the availability of DNA evidence influenced the decision to prosecute, L31 said:

> No, it doesn't because it's the lack of evidence that assists rather than the existence of evidence that doesn't assist. So, it's a different strategy when you analyse it as a prosecutor. So, there was no DNA found on the knife? It doesn't mean anything. So, no [having DNA evidence] doesn't affect the prosecutor's decision [to prosecute] at all, unless it's a rape case and you've got DNA and that's all there is.[66]

Regardless of whether DNA evidence has a greater influence because of its absence or presence, this quote demonstrates that there is an awareness amongst prosecution lawyers, as evidenced also by the Victorian protocol, that DNA evidence alone may not justify a prosecution. This is so even though some view DNA evidence as potentially inherently sufficiently strong, or of sufficient strength in the case at hand, to justify proceeding in the absence of other circumstantial evidence.

5.6 The nature of working on a case-by-case basis

It is important to acknowledge the reality of working in a system where lawyers handle a high volume of criminal cases with a wide variety of evidence types relevant to the facts in issue. In order to practice criminal law, lawyers must acquire knowledge of various areas in relatively short periods of time. This

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[64] Interview with L25 (8 September 2011). Also see interview with L34 (6 September 2011) who agreed, 'it without a doubt influences the decision to prosecute'; and interview with L39 (7 September 2011): 'oh, undoubtedly it does. I mean leaving aside DNA only. Most definitely it does. I mean despite my own personal misgivings, it is a very strong prosecution cloak and it's a good one to have in your armoury.'

[65] For a discussion on the use of this test by the Office of Public Prosecutions in Victoria see John Champion, 'Plea Offers and Discontinuances DPP Speech' (Paper presented to Law Institute of Victoria Annual Criminal Law Conference, Melbourne, 27 July 2012) [2]–[3] <http://www.opp.vic.gov.au/getattachment/4391b56c-dfce-4569-ba7f-571999aa0388/DPP-speech-to-LIV-annual-criminal-law-conference.aspx>.

[66] Interview with L31 (28 September 2011). L32 (22 June 2011) felt that, 'cops have really started to appreciate this or even prosecutors is that all the traditional methods of policing are still vitally important you've got to have witnesses that get the person to the crime scene you've got to get motive to get them to the crime scene. All the stuff that leads to a circumstantial case for them, which is a pretty good case, then the DNA becomes the icing rather than the cake.'

leads to a tendency to deal with DNA evidence on a case-by-case basis, with lawyers refreshing their knowledge of that evidence when they are faced with a case that so requires.

Undoubtedly, the most common reason given by interviewees for failing to engage more wholeheartedly with DNA evidence in general was that they work on a case-by-case basis and learn what is required for the case immediately at hand. If that case involves DNA evidence, then they learn about how the DNA evidence in that case was applied and tackle arguments concerning the use of the evidence in that specific context. One of the implications of this approach is that lawyers may engage in a repetitive relearning process as cases involving DNA evidence arise, possibly having to regain knowledge previously possessed but subsequently forgotten: 'We are event focused as barristers and we get a brief, you prepare the brief. It's a bit like being a surgeon. You go and do the job and put it away. Forget it. It's gone and you move onto the next one.'[67]

What this means for some lawyers is that they do not consider it important to learn everything they can about DNA evidence, or even more so, contentious DNA evidence, until they have a case before them that requires that very knowledge:

> I think issues don't crystallise themselves until you have to look at them. I think one thing that lawyers do is you have to become kind of a bit of an expert in whatever it is for maybe a couple of weeks of your life and it could be anything. It could be something to do with debt derivative, equities or DNA evidence. I've done those kinds of cases and ask me two weeks later and I wouldn't be able to tell you [anything about them] but I've got across that sufficiently for the couple of weeks I needed to and DNA is no different ... the finer details I leave to each case and to work out what the actual issue is. And then I speak to the experts.[68]

To similar effect L39 said that nothing inspires a lawyer to learn about evidence like DNA more than an impending case with a judge asking questions to make sure you understand what you are presenting.[69]

Lawyers commented on how they best learn about different types of evidence. This is discussed in more detail in Chapter 7. However, it is important to understand how the exigencies of practice affect lawyers' knowledge about different types of evidence. L9 helps to explain this:

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[67] Interview with L15 (7 September 2011). L15 also notes '[a] lot of this is reinventing, every time I do a DNA case, I've got to get back to it, because I'm not doing it all the time. So you've got to re-learn it ...'

[68] Interview with L38 (7 September 2011).

[69] Interview with L39 (7 September 2011).

> like most barristers I learn things as I do them and I don't retain a hell of a lot of it. I mean you read Rumpole of the Bailey and you see how he does it. It's perfectly real. I mean a barrister running a case is going to get on top of all sorts of technical material that he's got no idea really about. And as soon as he's finished the case it's gone out of his head.[70]

A key implication of this work/knowledge retention is that lawyers may be required to re-learn the basics of DNA evidence each time they have a case with potentially controversial DNA evidence. They assume they know nothing and go through a process of acquiring an understanding of how the DNA evidence has been used in each individual case they take:

> A lot of this is reinventing, every time I do a DNA case, I've got to get back to it, because I'm not doing it all the time. So you've got to re-learn it and go through a process, usually if you can with the expert witness, sitting down with them. So it's time consuming …[71]

In a slightly different vein, one of the judges noted that because DNA evidence is not 'readily repeatable next time' (referring to every case having different information and focusing on different aspects of DNA evidence), 'you might learn a thing, but you can't convey it to the next trial.'[72]

It is important that those who work in the forensic science arena, and particularly with DNA evidence, understand the practical constraints on lawyers' ability to gain and retain scientific knowledge. As noted in Chapter 6, forensic scientists are critical of lawyers' failure to communicate with them and of their level of competence in managing DNA evidence. An understanding of the exigencies of legal practice may enable forensic scientists to apprehend why lawyers wait until close to trials to engage

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[70] Interview with L9 (7 September 2011). See also interview with L13 (27 July 2011) who supports this statement: 'a lot of really good barristers, when challenging expert evidence will SWOT up on something to the point where, they're not better than the expert, but they can have a really competent conversation with the expert and it's just one of the skills of the lawyers. Just in the same way that you bone up on the facts of the case, until you know the facts of the case better than any witness there, because you know it from ten different perspectives, and some barristers will be able to do that better than others.' Also see interview with L30 (22 June 2011): 'Learning is by doing for me because [that is] the way that I learn. So it involves looking at it and trying to analyse what's happened [in each case]. Or as L31 (28 September 2011) points out, learning is done 'on the job.'

[71] Interview with L15 (7 September 2011). Also see interview with L7 (28 July 2011) who also has this view: 'it's the sort of knowledge I find that I have to refresh myself on each time because I'm not dealing with it probably … If I were running a sex practice it would probably become more embedded, but I find that I'm almost going back to scratch each time if I'm thinking about how I might sort of understand it in terms of … like this case where it involved sort of washing of clothes and strengths of samples and that sort of stuff. I'd have to go back to the beginning and do all the research I did all over again, so in relation to that.' Also see interview with L15 (17 September 2011): 'A lot of this is reinventing, every time I do a DNA case, I've got to get back to it, because I'm not doing it all the time. So you've got to re-learn it ... With barristers, you have to understand that whatever you did yesterday gets forgotten, you can't store it all and you let it go and if I did a DNA case tomorrow, I'd probably have to re-educate myself in three months' time for DNA again.'

[72] Focus group with P4 (3 May 2011).

with them. It may also encourage them to work with lawyers in ways that overcome potential problems arising from such delays.

5.7 Does your side count?

It is important to recognise that lawyers do not use DNA evidence in a vacuum. They work within an adversarial system, which necessarily generates adversarial modus operandi for counsel. Often, significant systemic tensions are generated by the adversarial nature of the criminal justice system itself. Defence lawyers, for example, tend not to consider DNA evidence with the primary focus of proving the truth of what happened in the course of the alleged event. Instead, their aim is to cast doubt on the DNA evidence, even when there is nothing to suggest that that evidence is anything but robust. In order to do this, they have developed various tactics, including maximising or creating confusion about its interpretation and undermining its weight. Their overall aim is to wreck its probative force. Adversarialism also encourages defence lawyers to use the absence of DNA evidence tactically even where its absence is of little or no relevance. Further, for tactical reasons defence counsel may avoid communicating with prosecution experts in any way that might disclose their case or intended approach at trial. Rather they adopt a 'trial by ambush' approach, which discourages revealing information about their own case to the opposing party and that party's witnesses. The tensions that these matters create arise because, either the tactical advantage they seek to achieve is of limited or questionable effectiveness, or they impose limitations on lawyers' ability to gain detailed knowledge of DNA evidence generally and of the DNA evidence in particular cases — knowledge which might promote different strategic approaches or increase their overall effectiveness in managing DNA evidence. Further, although lawyers are officers of the court[73] rather than solely prosecutors or defence lawyers who are bound exclusively to their clients, the data suggest that lawyers' roles in the adversarial system heavily influence their access to information or perceived access to information and, therefore, their understanding of DNA evidence.

5.7.1 Casting doubt

A prominent component of a defence lawyer's role is to cast doubt on the DNA evidence presented by the prosecution. In general terms, defence lawyers cast their role as finding 'any hole in the case [where there is] reasonable doubt',[74] without necessarily focusing on the most likely version of events.

[73] See *Legal Profession Act 2004* (Vic) s 2.3.9 and *Legal Profession Act 2006* (ACT) s 28.

[74] Interview with L13 (27 July 2011).

DNA evidence can pose particular problems for them because of the high status generally ascribed to its probative value.[75] The following statement made by L19 illustrates this problem:

> in defence where you want to have the capacity to run riot and cause confusion and mayhem to the enemy's case, DNA has the salutary effect of cutting off all sorts of avenues of exploration for alternative hypotheses you can raise. That's what you do in defence, you don't care about guilt or innocence in the pure sense, but just see if we can wreck the other person's case.[76]

Nevertheless, defence lawyers participating in this study identified lines of attack for diminishing the probative force of DNA evidence. Prominent amongst these is the creation of confusion about the meaning of DNA evidence. For example, L19 pointed out that referring to the various databases[77] allows the defence to 'create a bit of confusion, because that's what it's all about.'[78] Using this tactic, defence lawyers may attempt to make DNA evidence as complicated and long-winded as possible in order to confuse juries and encourage them to attach little weight to it. L29 described this process: 'A good defence lawyer will simply untangle every strand in the process and have it go for days.'[79]

Another tactic is to concentrate on any perceived weakness in the evidence and play on it to undermine its weight. For example, L29 noted that, 'a defence lawyer won't talk about [the] strength of evidence, they'll talk about the weakness. So they find the greatest weakness and then they just keep banging away at it.'[80]

In contrast, according to L29 an effective prosecutor makes the DNA evidence as simple and as easy to understand as possible:

> Well an effective prosecutor will simplify it and an effective prosecutor will break it down to its bare bones. A sample taken, put in the machine, a DNA sample extracted [and] multiplied so that you can see it on a graph ... That's what a good prosecutor would do ... [do it] simply like that.

While defence counsels' approach may be that of the wrecking ball, creating confusion and tapping any weakness in prosecution evidence rather than the vigilant crusader for truth and justice in the

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[75] See discussion of *Meyboom* at 2.3.2; and see for example, Johanna Veth, Annabel Ahuriri-Driscoll, Victoria Grace and Gerald Midgley, 'Lay and Professional Understandings of Forensic DNA Evidence' as cited in James Wallman, Claude Roux and Chris Lennard (2011) 7(1) *Forensic Science, Medicine and Pathology* 75-138; see also Grace et al, above n 55.

[76] Interview with L19 (26 July 2011).

[77] Databases used to store the various DNA profiles collected across Australia and the world of various groups of the population.

[78] Interview with L19 (26 July 2011).

[79] Interview with L29 (22 June 2011).

[80] Ibid.

sense that a layperson might expect, this is done in the best interests of the client and provided it complies with ethical standards, may not be improper. Nevertheless, this approach does raise questions about just how justice is achieved, and the extent to which it may cause juries to misjudge or misunderstand DNA evidence, so that their assessments of it are ultimately not soundly based.

5.7.2 Lack of DNA evidence

The data demonstrate that defence lawyers may emphasise the absence of DNA evidence at a crime scene.[81] For example, if there is no DNA as part of a brief, L14 says 'it's one of the first things I point out to the jury, for sure.'[82] If the prosecution does not have DNA evidence to present to the jury, this can provide defence lawyers with a tactical weapon to erode the persuasiveness of the prosecution case. L19, for instance, referred to being able to 'go to town'[83] if a prosecutor reveals the informant did not collect or provide DNA evidence.

5.7.3 Timing

Lawyers are responsible for introducing DNA evidence, and by doing so, they define DNA evidence as supporting or refuting the major issues in the case. They may also challenge DNA evidence, either seeking for it to be excluded or attempting to reduce the weight the fact finder may attach to it. Timing may be crucial in this regard.

Because court time is limited and expensive, lawyers must present evidence and their cases quickly and efficiently and they cannot devote unlimited time to analysing all evidence presented in a case. McEwan argues that this means lawyers cannot apply the same level of investigative or forensic thoroughness that a scientist would employ before reaching a conclusion.[84] They must determine matters in issue and present evidence to establish their parties' cases within a fairly limited time frame.[85] This is particularly relevant to DNA evidence because it can often take long periods of time for DNA results to become available and lawyers may receive results only shortly before a trial commences. A number of defence lawyers interviewed for this research noted the inefficiencies they faced in relying on a duty of disclosure by the prosecution for forensic reports in some cases.[86] This

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[81] For further discussion of this in the thesis, see discussion above at 5.5 in its capacity to reveal how the absence of DNA evidence is used tactically by the defence and therefore the extent to which DNA evidence is 'just another piece of evidence.'

[82] Interview with L14 (28 July 2011).

[83] Interview with L19 (26 July 2011).

[84] Jenny McEwan, *Evidence and the Adversarial Process: The Modern Law* (Blackwell, 1992) 33.

[85] See discussion at 5.6 on the time constraints associated with dealing with cases on a case-by-case basis.

[86] See discussion of whether your side 'counts' at 5.7.

delay means that lawyers may prepare their cases without what is often a key category of evidence. It delays consultation with experts who may give further insight into the testing and the results from DNA evidence samples. These considerations affect how criminal trials are conducted and the fairness of the trial itself.[87]

5.7.4 Avoiding experts and trial by ambush

The data reflected hesitancy by many defence lawyers to engage with State forensic experts. For some this was a tactical decision. This decision was made despite knowing that these experts are available to them. Even judges suggested that talking to opposing parties' experts might be inadvisable as potentially alerting the opponent to the defence approach to the case (although as the following quotation from the focus group with judges shows, there were conflicting judicial views in this regard):

> P3: I'm not sure that that will necessarily make it [DNA evidence] clearer; it will only telegraph your punches.
>
> P4: Very likely, but telegraphing your punches is not a reason for excluding that sort of approach.
>
> P2: In civil cases I agree with you but I don't think it would work in a criminal case.[88]

The negative view of communicating with the opposing party's expert witness was echoed in the following comment of L30:

> Well we generally don't try because what's the point in talking to the expert on the prosecution side because you're going to flag the issues that you want to raise and you might not want to flag those in advance.[89]

The hesitancy to provide information to the prosecution about the defence case is illustrated by the following statement of L35: 'It is an adversary [system] and so ... I would be very careful, very, very careful about playing my hand.'[90]

For lawyers, 'displaying their hand' is seen as undesirable because in the adversarial system, one side is pitted against the other. These quotes demonstrate how the adversarial system itself influences

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87 For a discussion of the human rights framework (and ultimately the fairness of the trial itself): see 3.4.

88 Focus group with P2, P3 and P4 (3 May 2011).

89 Interview with L30 (20 June 2011).

90 Interview with L35 (28 July 2011). This is echoed in the statement of L11 (24 June 2011): 'it's [a] practical reality. It takes a very long time to get to trial. Asking too many questions in the early stages can be tactically not in the interests of your client, if you tip off the other side, so to speak … So if you leave it to the end of the day, it's too late to fix up mistakes ...'

defence lawyers' approach to obtaining information from probably the most prominent source of DNA expertise, state forensic analysists.

Although many lawyers acknowledged that there is no property in an expert, very few defence lawyers approached forensic experts employed by the State. However, conflicting attitudes to this matter were evident. Some defence counsel signalled the need for care while recognising the benefit to be obtained from communicating with Crown experts. The following statement is from one such lawyer:

> Well, there's no property in an expert. There's no property in a witness but you have to be careful obviously, but with an expert witness far from it. A number of times I've had experts who have been helpful to me.[91]

This interviewee further noted that not only does his understanding improve when he speaks to prosecution DNA experts, but that also he is often surprised with the level of assistance he might receive.

Some participants, when discussing communication between expert witnesses and opposing counsel, pointed to a distinction between pathologists and forensic scientists. L12, for example, said that pathologists as a profession are open to having defence counsel contact them to ask about the evidence and any test results but that the same culture of accessibility and openness is not as prominent in forensic science laboratories.

> You can ring up a pathologist and say I read your report and what did you mean by this and couldn't there be another explanation and they'll generally talk and discuss. That culture of accessibility and openness isn't as prominent at the forensic science laboratory, and it never has been, so that's a difficulty.[92]

This culture of lack of accessibility may make it more difficult for lawyers to ask the questions that competent lawyers need to ask of DNA experts. Moreover, these are the questions that forensic scientists say lawyers need to ask in order to present the evidence adequately.

Clearly, it is not simply that lawyers have difficulty gaining access to experts or that they find it difficult to communicate with experts in their scientific language.[93] Tactical considerations involved in defence counsels' decisions not to communicate with prosecution experts pose significant challenges for those seeking to improve their knowledge of DNA evidence both generally and in specific cases with a view

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91 Interview with L4 (25 October 2011).

92 Interview with L12 (8 September 2011).

93 The difficulty that some lawyers have with communicating DNA evidence and communicating with forensic scientists is discussed at Chapter 6.5.

to preventing further miscarriages of justice. Considerations arising from, and embedded in, the criminal justice system are particularly difficult to counter.

5.8 Prosecution and defence considerations

While the adversarial system and fair trial principles are premised upon the equality of the adversaries, in reality that equality does not exist. The greatest force of arms lies firmly with the State. This has implications for defence lawyers' ability to discharge their responsibilities with respect to both eliciting and challenging DNA evidence. It is important that this tension between prosecution and defence be understood because of its potential to inhibit defendants' equal access to justice. In the context of DNA evidence, the unequal positions of defence and prosecution counsel emerges particularly in their differential access to DNA expert witnesses. It also has the potential to generate different levels of competence in dealing with DNA evidence between defence and prosecution counsel. However, counter-intuitively, the data suggest that defence counsel display greater competence in handling DNA evidence than prosecution counsel. Nevertheless, interviewees still felt that there was room for improvement by both prosecution and defence lawyers. The discussion here focuses on these matters. Availability of adequate time and funding also differs for defence and prosecution counsel. Both are matters likely to affect their ability to manage DNA evidence effectively.

5.8.1 Lack of defence experts

Although the forensic scientists who took part in this research were very open to both prosecution and defence lawyers asking them questions about individual cases, defence lawyers did not feel that they had the same level of access as prosecutors to the State experts. Additionally, there are few independent or defence DNA experts available for the defence to consult. In this regard L18 said, '[t]here aren't that many experts available to the defence anyway and they may or may not have the ability to understand enough about the case to know what it is they're supposed to be looking for.'[94]

Similarly L5 stated,

> the other thing in terms of calling your expert, there's very few defence experts. I won't say defence, there's very few experts outside of DAL [Division of Analytical Laboratories] who are about to give that evidence.[95]

However, these two lawyers were not greatly concerned about gaining access to forensic biologists in State laboratories and talking to them about the DNA evidence in their cases. In fact, L5 simply said

[94] Interview with L18 (26 October 2011).

[95] Interview with L5 (26 October 2011).

that he 'wouldn't bother' talking to forensic biologists from State laboratories. Their concern was instead with the lack of other experts available to the defence. They assumed that they either could not speak to the State experts or that they would not have been given the best information available for their case had they done so. None of the defence lawyers interviewed said that they routinely speak to 'State' forensic scientists about testing procedures or the analysis of DNA results.

L13 noted that he did not speak to crime scene investigators or police officers involved in investigations, but had always assumed that as witnesses for the State, the forensic scientists would not speak to him. This is a non-tactical but, nevertheless, adversarial reason why defence counsel may not talk to prosecution experts. L13 acknowledged that he spoke to the prosecutor and the informant in some cases but that everyone else is seen as 'off bounds' within the adversarial system:

> my impression is that generally speaking, you get to talk to the prosecutor and to the informant and everyone else is seen as off bounds and if you want to speak to them, you speak to them through the committal process, which is a very cumbersome, long process. But I've never tried to speak to a crime scene examiner about something like this, but maybe they would. Maybe I'm incorrect in thinking that they wouldn't want to speak to you.[96]

It is important that defence counsel understand the chain of evidence. Their level of understanding in this regard may depend on the extent to which they communicate with State DNA experts pre-trial. Such understanding is, of course, necessary to help ensure that they are able to expose any weaknesses or possible flaws in the DNA evidence during cross-examination and alert juries to potential limitations of the evidence during closing addresses. These weaknesses and possible flaws rarely present themselves or come with explanatory labels in criminal cases. If defence counsel does not have access to experts then they may not recognise that there is a problem with or limitations to the casework. For example, without that access to independent experts, lawyers are limited in their understanding of how complex mixtures and incomplete DNA profiles can be particularly problematic.[97] Cross examination can only be conducted in this way if counsel has engaged in effective pre-trial preparation and discussions with State experts about the procedures they employed. The quote below implies that this is one lawyer who is willing to talk to State experts as well.

> So I think it's important to actually go through the process sometimes and have a witness identify the methodology [of how the collection of evidence and testing was conducted and explain these in court]. So identify the fact that what's being looked for in the first instance is whether or not the

[96] Interview with L13 (27 July 2011).

[97] See Peter Gill, *Misleading DNA Evidence: Reasons for Miscarriages of Justice* (Academic Press, 2014). See section 4.28 for a discussion of complex mixtures and incomplete DNA profiles.

> sample can be excluded. And make sure that the jury understands the process. And not in any great detail but they need to understand the process. Then, you can then explain the limitations of that to the jury, in the course of the closing address.[98]

This quote identifies the benefit that may be derived from talking to State experts in understanding how evidence was collected, tested and interpreted. This lawyer refers to a State forensic expert giving evidence in a trial against their client, the accused. It reveals that this defence lawyer is interested in the process of collection, storage and analysis of DNA evidence, such that the jury would also benefit from this explanation and be sure that contamination or transference, for example, have not taken place.

5.8.2 Lawyer competence

It is trite to say that lawyers who engage with the material and go beyond textbooks in learning about DNA analysis are likely to be best positioned to manage DNA evidence effectively. The question is to what extent such effort is reflected in lawyers' competence in dealing with DNA evidence. What emerged from the data, is that defence counsel appear to be prepared to engage more thoroughly in gaining an understanding of DNA evidence and how to deal with it than prosecution counsel. This is despite their relative lack of access to expert assistance. This view is exemplified in the following statement made by P3, a judge who participated in a Focus Group:

> the defence counsel was seriously competent and obviously did understand all the ins and outs of the DNA, how it was analysed and what the results meant ... He'd taken the trouble to understand the whole thing and was able to cross-examine the expert into agreeing that her analysis was simply speculation and not anything more than a probability.[99]

It is important to consider the above quote in the context of the defence lawyer's role which is to challenge evidence adduced by the prosecution. This role may motivate defence lawyers to obtain knowledge about where the potential to challenge that evidence may lie in both the procedures and science involved in DNA collection, analysis and interpretation. P3 additionally said that the defence lawyer's case appeared more persuasive because the prosecutor had not engaged with the expert or demonstrated any working knowledge of the DNA evidence.[100] Generally, P3 felt that defence counsel

[98] Interview with L33 (25 July 2011).

[99] Focus group with P3 (2 May 2011).

[100] Ibid.

engaged in a more significant manner with the evidence in order to challenge the prosecution case or argue for its limitations:

> But the overwhelming impression was that the prosecutor did not understand DNA ... the defence counsel that was briefed for the client that I was there for clearly had an incredible grasp of DNA and most importantly appeared to translate it, if you like, in a way that the jury might understand. And he absolutely destroyed it.[101]

Prosecutors' lack of understanding of DNA evidence was remarked upon by a number of interviewees, particularly in comparison to defence counsel who were perceived as having a better grasp of the evidence and accordingly greater competence in dealing with it, and in particular, in challenging it and cross-examining expert witnesses.[102] If prosecutors cannot adequately introduce or explain DNA evidence, or ask effective questions of forensic scientists then the jury may be left with an incomplete picture of that evidence.[103]

Effective communication between prosecution lawyers and forensic scientists is also important as demonstrated by the following quote from one of the judges interviewed. It speaks to prosecution counsels' lack of preparation compared with that of defence counsel. This is important because the weight accorded the evidence of even the most competent expert witness will depend upon the skill with which it is adduced by counsel:

> You really need cooperation in the presentation between lawyers and forensic experts. Where you get an incompetent prosecutor ... even if the forensic expert is full bottle and very good, it won't be presented properly because it's up to counsel to make sure that the expert explains it to the judge or jury in terms that the judge or jury can understand. If they don't do that, it's a complete fog. Unfortunately, we find a lot of the prosecutors simply aren't on top of it.[104]

This statement suggests that the lack of communication and cooperation between expert witnesses and counsel is not limited to defence counsel, but also extends to prosecution counsel.

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[101] Interview with L28 (28 July 2011).

[102] Interview with L28 (28 July 2011). See also FS2 (4 June 2011) who found 'prosecutors are the worst' and FS1 who 'had one particular case when the defence lawyer was quite well known for his knowledge of DNA and the prosecutor was [not]. I was getting better worded questions [from the defence as a result], more technical questions and I was able to answer those better' 4 June 2011).

[103] See Chapter 6 on the difficulties of communicating DNA evidence at 6.5. It was found that forensic scientists are particularly concerned that most lawyers do not understand their evidence, and that they cannot communicate the strength of their evidence adequately through lawyers in court.

[104] Focus group with P1 (3 May 2011).

A prosecutor also noted that it is important for an expert to explain to the jury what DNA evidence is, the techniques used in the testing process, what probabilities mean, the databases used and finally, the chain of evidence:

> if it is a jury trial it is important for them first of all to learn what DNA evidence is. So, I will have the forensic expert explain in general terms what DNA is and in general terms the kind of techniques that they use to extract DNA, the various processes, extraction and amplification and so on, and then what the probabilities mean and the database that they used for that, and that can be a source of some debate sometimes as well ... But certainly making sure that the jury is told the basics about DNA and so on and in as easily understandable terms as you can, what all of these various things mean before you actually go to the items themselves and then talk about what the results were in relation to those particular items and what were the probability ratios and what does that mean in lay person's terms and that's where it becomes difficult because your forensic experts will, of course, only use, as is appropriate, language that they consider to be technically correct but if that is not expressed in a way that makes it easy to understand, then that can be quite difficult in having a jury understand what that means.[105]

To elicit this information, it is important for lawyers to communicate with experts to ensure their own understanding of the forensic biologist's testimony and an understanding of DNA evidence itself.

As P1 stated above,[106] if the lawyer does not understand or is incompetent in their communication of the information in court, the jury will find it difficult to follow the examination in chief by prosecution counsel and the cross examination by defence counsel. A lawyer will only be able to ask a forensic biologist to explain DNA evidence — including probabilities and likelihood ratios — and the testing procedures employed, if the lawyer is competent and understands the evidence and has an understanding of how the expert will present the evidence. Accordingly, talking to a witness about what he or she will be asked at trial is important. This means that cooperative communication between experts and lawyers in this respect is paramount to the success of a criminal trial.

The minutiae of accepted practice often depends on lawyers' competence, access to experts and opportunities to communicate with forensic scientists. For example, while it might be accepted that lawyers should investigate the chain of evidence before trial,[107] in practice the prosecution will only do this if alerted by the defence to the fact that it might be in issue.

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[105] Interview with L36 (20 June 2011).

[106] See quotation at p 139.

[107] See discussion at p 139 above.

L23 explained the conditions for further investigating the chain of evidence if the defence puts the prosecution on notice that it is in contention:

> L23: I don't [look at the chain of evidence] unless I know it's going to be an issue.
>
> R1: How would you know that?
>
> L23: The defence are required to put you on notice on that.[108]

This approach is dependent upon the defence being able to identify that this might be in issue at an early stage — something that might be influenced by the lawyer's competence, their access to experts and the opportunities to communicate with them. These are difficulties experienced by lawyers and explored further in Chapter 6.[109]

These are challenges that go beyond simply understanding DNA evidence in a scientific or procedural sense. They comprise contextual challenges of practising in an adversarial system which necessarily generates a prosecution versus defence mentality.

Although all lawyers are officers of the court, the data demonstrate that a lawyer's position as either a prosecutor or defence lawyer does influence their management and use of DNA evidence in criminal trials. Forensic scientists and judges who participated in this research suggested that defence lawyers have a greater competence in dealing with DNA evidence than prosecution lawyers. They also indicated that it is beneficial for defence lawyers to talk to them, though this rarely occurs.

5.9 Conclusion

This chapter has explored lawyers' understanding of DNA evidence by uncovering and discussing the key practical realities they are subject to in using DNA evidence in their criminal practice. The themes that were identified began with an acknowledgement that although DNA evidence is common it is rarely contentious in criminal cases in Australia. For those cases that do have contentious DNA evidence, lawyers are torn between gaining knowledge of relevant scientific principles or of the applicable forensic procedures. Discussion in Chapter 2 of the case law in this area suggests that it has rarely been the science of DNA that has been the primary cause of the injustice.[110] Rather it has been the procedure involved in either collecting or storing the evidence that has been problematic. This finding runs counter to the recommendations of the Vincent and NAS reports that suggest that lawyers

[108] Interview with L23 (8 September 2011).

[109] See Chapter 6: Difficulties with DNA evidence.

[110] See 2.4.

should learn more about the science of DNA evidence. This chapter has also revealed that although DNA evidence may be just another piece of circumstantial evidence, lawyers and courts, nevertheless, tend to place more emphasis on this evidence than on other types of circumstantial evidence and that it is one of the few types of evidence that will influence the decision to prosecute where only one item of circumstantial evidence is present. Defence lawyers were seen by lawyers and forensic scientists as being more competent in using DNA evidence. This chapter noted that lawyers approach cases on a more ad hoc basis than might be expected, and thus deal with cases involving DNA evidence on a case-by-case basis. The implications of this approach for their acquisition and retention of knowledge were explored. Finally, it explained some of the tactics lawyers (mostly defence lawyers) use in challenging DNA evidence — including how to cast doubt on the evidence, how to conduct a trial by ambush and how to make tactical use of a lack of DNA evidence. It also considered the effect of the perceived lack of experts available to the defence for their management of DNA evidence. The themes and the realities considered here cannot necessarily be resolved. Yet it is important that their existence is acknowledged and recognised as they give us a better understanding of the practicalities involved in the use of DNA evidence in the legal context. They are the realities that were not discussed in the *Strengthening Forensic Science in the United States: A Path Forward* [111] (NAS Report), and other reports into miscarriages of justice in this area.

These themes will have an influence on the difficulties that lawyers experience in managing and using DNA evidence in the following chapter (Chapter 6) and the type of DNA evidence education that lawyers may find most useful (Chapter 7).

[111] National Research Council Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) National Academy of Sciences <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>.

6 Difficulties with DNA evidence

> I find all of it confusing! I find the mathematics, not being a mathematics guy, incredibly difficult. I find the law about it difficult, the law isn't easy. I find understanding the processes involved in extracting it difficult and that's a big issue if ever you want to challenge it one of these days, and the way they arrive at a profile I find that quite difficult as well. I find the whole thing difficult to understand, and when it's simplified for me sometimes it just creates more questions in your mind, you can understand it in a very simplistic way.[1]

6.1 Introduction

This chapter aims to assist in our understanding of how lawyers deal with and manage DNA evidence, and allow us to determine what difficulties, if any, they have in dealing with DNA evidence in criminal trials. The research and reports in this area have been critical of lawyers, and have suggested that they improve their knowledge of and skills in handling DNA evidence.[2] The previous chapter (Chapter 5) provided an overview of the tensions that exist in practice for criminal lawyers when dealing with DNA evidence within an adversarial legal system.

The quote that introduces this chapter is a cri du coeur about the difficulties lawyers experience with DNA evidence. This chapter explores these problems. Its analysis is guided by the practical experiences and realities of practising criminal law discussed in Chapter 5.

It is important to assess and understand the difficulties lawyers experience when dealing with DNA evidence because these must be addressed, alongside the considerations posed by Chapter 5, before any improvement in criminal law practice can be achieved. This chapter begins by addressing the concerns of previous researchers and authors of the reports on forensic science in this area[3] with emphasis on the difficulties lawyers experience with DNA evidence. The aim is to pinpoint how lawyers' knowledge and engagement with DNA evidence can be advanced and improved.

Three major areas of concern were identified in the analysis of difficulties experienced by lawyers when dealing with DNA evidence:

- difficulties with the science;

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1 Interview with L14 (28 July 2011).

2 See Chapter 2: Justifications for the research.

3 Ibid.

- procedural difficulties; and
- difficulties in communicating DNA evidence.

Excerpts taken from the interview transcripts are provided as exemplars of these themes and links are made between the themes identified, the research literature and case law. Finally, the implications for practice are discussed for each of the difficulties identified.

The difficulties lawyers experience with the science of DNA evidence relate principally to the use of probability ratios and to the interpretation of mixed profiles. Lawyers' misunderstanding of the science springs largely from the problems inherent in determining how (if at all) probability ratios can be married to the concept of 'reasonable doubt.' Those lawyers who had the opportunity and/or initiative to talk to experts on DNA evidence found that their understanding of the science and probability ratios improved considerably.

Many of the problems occurring in pre-trial procedure are linked to lawyers' inability to identify errors in forensic procedure, either from the criminal brief, in the case of prosecution lawyers or, in the case of defence lawyers, from the information disclosed by the prosecution. A lack of understanding of the forensic procedures used in collecting DNA evidence coupled with lawyers' feelings of inadequacy in dealing with DNA evidence generally contributes to their failure to challenge the evidence adequately. For example, contamination, although reasonably well understood by lawyers, remains problematic because lawyers do not feel that they have the ability or information to be able to determine if contamination has occurred. Further, their understanding of contamination appears to have a significant element of 'hindsight'. That is, it is based on previous miscarriages of justice, rather than on a strong alertness to, or awareness of, the potential weaknesses in practice in DNA collection procedures. During trial, two matters present as particularly problematic for lawyers — first, the examination and cross-examination of expert witnesses and, second, the blurring of the roles played by lawyers and experts in presenting and challenging this evidence.

The major issues with communication are the lack of it and lawyers' and forensic scientists' divergent perceptions about the role of the forensic scientist when testifying.

The failure to discuss DNA evidence with the expert witnesses contributes to lawyers' misunderstanding of the science, their inability to uncover flaws in pre-trial investigative processes relevant to DNA evidence and to their lack of confidence in presenting and challenging DNA evidence at trial. Lawyers also find forensic reports on DNA evidence difficult to understand which contributes to their apparent unwillingness to communicate with forensic scientists pre-trial and to flaws in their eliciting information or challenging of DNA evidence at trial.

The role of the forensic expert in explaining DNA evidence in court is an area of contention. Some lawyers believe that it is not the lawyers' role to understand the science but instead to understand how to introduce the expert and ask the 'right' questions. They devolve responsibility for communicating and explaining the evidence almost entirely to the forensic expert. The biggest concern with this approach is that forensic scientists do not believe that lawyers *are* asking the 'right' questions and so conclude that courts are being left with misinterpretations of the language and terminology used and varying interpretations of the strength of the probability ratios in individual cases.

The three themes identified in the analysis of the difficulties experienced by lawyers when dealing with DNA evidence will now be explored in greater detail.

6.2 Difficulty with science

The first theme identified during the analysis was a difficulty with DNA science itself — the scientific principles used in the detection, testing and analysis of biological material and the detection of DNA profiles using physical and/or trace evidence collected at crime scenes and from individuals. There were two areas that were of the greatest concern to lawyers. The first is the use of probability ratios, Bayesian statistics and numbers in DNA evidence interpretation and reporting. The second is the increasing detection and reporting of mixed profiles found in DNA evidence deposited at crime scenes. Interviews revealed that probability ratios and mixed profiles lead to confusion, misinterpretation and uncertainty in the use of that DNA evidence by lawyers in criminal trials.[4]

6.2.1 Probability ratios and Bayesian statistics

Understanding and managing probability ratios and statistics was a common cause of concern for a great many lawyers interviewed.[5] This remains difficult even for more experienced lawyers, senior practitioners and judges. The following quote demonstrates this difficulty:

> But the area of forensic statistics is erupting as especially problematic, again in terms of lawyer performance because there are so few lawyers who are equipped to ask the right sorts of questions and evaluate claims, and of course statistics lie at the heart of the potency of DNA evidence. The

[4] These difficulties were exposed by question 5 in the Interview Schedule for focus groups and questions 2A, B, C and D for interviews — see Appendix G and F.

[5] Interview with L15 (7 September 2011); interview with L28 (28 July 2011); interview with L9 (7 September 2011). Revealed in response to question 5 in the Interview Schedule for focus groups and questions 2A, B, C and D for interviews — see Appendix G and F.

> numbers re-emerging these days are so extraordinarily high as they were in the very early stages and then are so high as to be almost meaningless ...[6]

Statements like this reveal that lawyers may begin from a point of confusion and they see the Bayesian statistics used as virtually meaningless. This also accords with the view of some of the senior practitioners interviewed[7] and that of Refshauge J in *Whyms*[8] who admitted to finding statistics and DNA evidence 'quite murky'[9] and confusing.[10] He placed himself in the 10% of judicial officers in Freckleton, Reddy and Selby's research who find this to be the most difficult area of expert evidence.[11]

The difficulties with probability ratios and statistics can be classified into four key areas. The first is difficulty with the numbers used in the calculations and presentation of DNA evidence. The second is the language and expression used by scientists in reporting probability ratios and statistics. The third is the inherent difficulty in reconciling the probabilistic nature of DNA evidence with the beyond reasonable doubt standard of proof in criminal cases. Finally, lawyers feel intimidated and even overwhelmed by evidence presented in this way and find the numbers 'too hard' or 'too confusing'.

These findings accord with those of Grace et al[12] who found that lawyers have significant difficulty in understanding and tackling probability ratios.[13] The case of *Aytugrul v The Queen*[14] in the High Court confirms that the communication of probabilities and statistics remains a live issue in criminal trials.[15]

The numbers

The present study provides detail of the scientific aspects of DNA evidence that lawyers find most daunting — mathematics and numbers being identified as among the most unnerving. The most common response when lawyers were asked what they found most difficult about DNA evidence was probabilities.

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6 Interview with L12 (8 September 2011).

7 Interview with L14 (28 July 2011); L12 finds the numbers 'deeply confusing and … deeply intimidating' (8 September 2011); interview with L2, talking specifically about statistics with mixed profiles (21 June 2011).

8 *R v Whyms* [2012] ACTSC 7 (17 January 2012).

9 Ibid [70].

10 Ibid [77].

11 Ian Freckelton, Prasuna Reddy and Hugh Selby, *Australian Judicial Perspectives on Expert Evidence: An Empirical Study* (Australian Institute of Judicial Administration, 1999) 66.

12 Victoria Grace et al, *Forensic DNA Evidence on Trial: Science and Uncertainty in the Courtroom* (ISCE Publishing, 2011). See discussion in Chapter 2.2.1.

13 Ibid 69–70.

14 *Aytugrul v The Queen* [2012] HCA 15.

15 Ibid. See [7]–[15] for discussion on the various probability ratios used in this case.

> The arguments in court I reckon have changed from everyone trying to blind juries and judges with these Google plex numbers. Now how can you say 1 in 250 billion people? That's ridiculous. [There are] only 5 billion people on the planet. It's such a practically stupid number that people tend to say bloody scientists have no idea about the real world.[16]

More specifically, one of the primary concerns expressed by lawyers was the mathematics involved in generating probability ratios and in DNA interpretation and reporting generally. This is illustrated in the following quotes from lawyers:

> Where I've got difficulty with it, and I suspect a lot of people do, is what these figures really mean because you have this expert saying 1 in 30,000 so therefore it's a strong indication? What?[17]

> Yeah and they use a different language. If you don't understand the language and you don't understand what you're looking for its meaningless and there's a lot of different stages in the process, getting to that figure, and then a lot of it is plugging things into a computer so you've got to get to a point where they look at the data, how would they arrive at the data that they plug into the computer because you can't really challenge the mathematics. It's not done by a human being.[18]

Lawyers therefore just 'creep by in terms of understanding what is going on ... [one lawyer] is aware [their] level of knowledge of DNA would be 1% of the scientist expert.'[19] On more than one occasion lawyers responded to a question with, 'I did law because I can't understand maths!'[20] The interview with L14 also typifies this view, as this excerpt, also provided above in full at 6.1 demonstrates: 'I find all of it confusing! I find the mathematics, not being a mathematics guy, incredibly difficult.'[21]

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[16] Interview with L32 (22 June 2011). Also see interview with L36 (20 June 2011): 'I find the ways in which probability ratios and so on are expressed to be quite confusing.'

[17] Interview with L23 (8 September 2011).

[18] Interview with L14 (28 July 2011). See also interview with L24 (24 June 2011) who stated the following: 'but maths, particularly that part of maths involving stats is very difficult for people to understand anyway. You know you might have done it in school and the probability of flicking 6 on a dice or something like that. Initially it's 1 in 6 and then it becomes this exponentially and so forth the more you throw on it. The same with flicking two coins getting heads and tails. So it's difficult concept unless you're a pure mathematician.' Also in an interview with L27 (21 June 2011), the following statement was made: 'I go numbers and then — what does that mean?' See also interview with L36 (20 June 2011): 'the most difficult? The probability ratio.'

[19] Interview with L5 (26 October 2011).

[20] Interview with L22 (20 June 2011). This statement is echoed in part by the responses of other lawyers, see also interview with L16 (7 September 2011) who had a science background himself but knew of other lawyers who were afraid of the mathematics of DNA evidence and statistics and stated 'some I know do law or used to do law because they couldn't do algebra.'

[21] Interview with L14 (28 July 2011).

This view presents a barrier to change that must be overcome before lawyers can become more adept at managing and using DNA evidence in criminal trials. The resistance to tackling the mathematics or learning more may be inferred from cases like *Jama*.[22] Accordingly, any further education in this area needs to acknowledge and overcome the difficulty that lawyers encounter with probabilistic and numerically based evidence. The 'law versus mathematics' mentality displayed by many participants suggests that a simple recommendation to 'learn more about DNA evidence' is not going to be achieved without putting measures in place to deal with barriers like an inherent fear of numbers and mathematics.

The influence that the 'it's just too hard' mentality has on practice is far reaching — lawyers use this as an excuse for their ignorance about scientific matters and it provides further justification for failing to learn more about DNA evidence. Avoiding the 'mathematics' and avoiding learning more about DNA evidence because it might involve consideration of 'Google plex numbers'[23] is a concern that may prevent lawyers from adequately and competently prosecuting accused or defending their clients in criminal trials.

Language and expression

Lawyers feel that there is ambiguity in the language and expression used to present probability ratios and Bayesian statistics in scientific reports and expert evidence in court. For example, one of the judges interviewed for this research believed an otherwise strong case against a defendant was weakened by the DNA evidence being expressed as 'his [the defendant's] DNA, [but] it could've been one of any of two other people in the area. That's nuts, that's got to be wrong but that's the evidence I've got.'[24] Similar confusion arising from the ambiguity of language used to present DNA evidence is seen in the response from L8: 'their language is strange. … I've never understood the way they insist on phrasing that this is 1000 times more likely to be someone other than B or not someone other than B. It's always in the negative!'[25]

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[22] *R v Jama* [2008] VCC 0886.

[23] Interview with L32 (22 June 2011).

[24] Focus group with P3 (3 May 2011). This was because of the argument run by defence counsel who was identified by other lawyers, and the judges in that State as being particularly interested in and competent in challenging DNA evidence.

[25] Interview with L8 (28 July 2011). See also interview with L9 (7 September 2011): 'the bottom line is this is more likely or the probabilities are this is more unlikely to be someone else, or however they frame it. I mean their language is strange. I mean I studied probability at a high level and I've never understand the way they insist on phrasing that this is 1000 times more likely to be someone other than B or not someone other. It's always in the negatives so it's quite difficult.' See also interview with L24 (24 June 2011): 'well when you get 1 in 20 billion what the hell does that mean out of 800 people? It's highly quite strong, very strong, whatever

There is also confusion with the use of verbal descriptors like 'extremely strong' and 'strong' rather than the exclusive use of percentages. The combined use of numbers and words does not alleviate this confusion:

> Because what is provided on one level are completely meaningless statements about likelihood ratios. And these tables ... will say, for instance 72 billion times more likely [that] a mixed DNA profile originated from the accused. They would say in relation to 72 billion times probability that that provides *extremely strong* [emphasis in the recorded interview] support for the proposition that the item came from X. What does that mean?[26]

This supports the research of Martire et al[27] on the ambiguity created by using certain words, particularly those on the scale used to describe the strength of DNA evidence. Most lawyers in Martire's research preferred the use of verbal descriptors like 'quite strong' or 'very strong' because this counteracts the overwhelming influence of numbers like 1 in 20 billion. Of additional note is the research from McQuiston-Surrett and Saks in America that found that the language used by experts clearly affects the inferences fact finders draw, often producing conclusions quite different to those intended by the expert.[28] The participants in the study were 183 undergraduate students who were eligible for jury duty. The evidence was presented to them using terminology adopted by the American Board of Forensic Odontology (ABFO). Based on this terminology the participants were asked to determine how certain it was that crime scene evidence originated from a suspect. The strongest correlation expressed by the ABFO, 'reasonable scientific certainty' was viewed as expressing a lesser degree of certainty than two other expressions – 'consistent with' (intended by scientists to be a much weaker term used to describe similarity, but no degree of specificity) and 'match' (intended to mean some concordance, but no expression of specificity).[29] This research suggests that jurors' interpretation of experts' expressions may well not match what experts intend to say. This is

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the expressions are — they [the jury] go oh ok, fair enough yeah. But still, those words mean different things — what does quite strong mean for a juror? Different to what it might mean for me as a lawyer, and a forensic scientist too.'

[26] Interview with L28 (28 July 2011).

[27] See Kristy A Martire et al, 'On the Interpretation of Likelihood Ratios in Forensic Science Evidence: Presentation Formats and the Weak Evidence Effect' (2014) 240 *Forensic Science International* 61; Kristy Martire et al, 'The Expression and Interpretation of Uncertain Forensic Science Evidence: Verbal Equivalence, Evidence Strength and the Weak Evidence Effect' (2013) 37(3) *Law and Human Behaviour* 197; Kristy A Martire, Richard I Kemp and Ben R Newell, 'The Psychology of Interpreting Expert Evaluative Opinions' (2013) 45(3) *Australian Journal of Forensic Sciences* 305.

[28] Dawn McQuiston-Surrett and Michael Saks, 'Communicating Opinion Evidence in the Forensic Identification Sciences: Accuracy and Impact' (2007-8) *Hastings Law Journal* 1159, 1189.

[29] Ibid 1162.

problematic — particularly if the strength given to evidence by a jury or judge as fact-finders is greater than that intended by the expert.

Two quotes in particular from lawyers in the present study illustrate how they feel about the language and numbers used to express probabilities and the Bayesian statistics used:

> I think that there is a fundamental problem with the way the likelihood ratio is described. It is in a sense … bulletproof, but it talks in probabilities that are so difficult to comprehend.[30]

> when you get 1 in 20 billion what the hell does that mean out of 800 people? Whereas [if] it's quite strong, very strong, whatever the expressions are — they go oh ok, fair enough yeah. But still, those words mean different things.[31]

For one lawyer, this makes the words and numbers 'essentially meaningless'.[32]

This accords with Martire's research, which suggests that the use of words like 'strong' and 'very strong' confuses juries.[33] The confusion partly arises from incongruent use of particular words. For example, one report might state that 1 in a million is 'extremely strong' support for a proposition, while another might say that 1 in 20 billion is also 'extremely strong'.[34]

This finding sits uneasily with the High Court decision in *Aytugrul*.[35] The Court was disinclined to accept the potentially unfairly prejudicial persuasiveness of the verbal descriptors in contention and the risk that jurors' might misinterpret the strength of DNA evidence relying on these terms.

While at least one lawyer interviewed for this research (L36) was aware of these studies,[36] surprisingly none of the defence lawyers interviewed mentioned it. L36 said:

> the ways in which probability ratios and so on are expressed [are] quite confusing and I have read some research about different ways of presenting the information and [how] some ways can make it more easily understandable but also can leave quite different impressions depending how you express the probability ratios.[37]

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30 Interview with L28 (28 July 2011).

31 Interview with L24 (24 June 2011).

32 Interview with L28 (28 July 2011).

33 Martire et al, 'The Psychology of Interpreting Expert Evaluative Opinions', above n 27, 309.

34 Ibid.

35 *Atygrul v The Queen* [2012] HCA 15.

36 Interview with L36 (20 June 2011).

37 Ibid.

Despite lawyers' preference for verbal descriptors over probability ratios, they are left confused by how verbal descriptors match with the numbers that reflect the same strength of result. If lawyers are unable to reconcile the numerical and verbal expressions of the strength of DNA evidence they will not know what strength and weight should actually be ascribed to it. This will be particularly problematic in situations where the same terms are used to describe a very broad range of numerical representations. The words used to describe probability ratios are applied differently in every case and in some matters, verbal descriptors are not used at all. Notwithstanding the broad scale of numerical representations of strength attributed to the verbal descriptors used, lawyers still prefer the use of the words to numbers.

The current approach to presenting statistics in court is a combination of both numerical and verbal descriptors, with no consistency between cases or jurisdictions. Lawyers must then present expert evidence by examining and cross-examining experts using both the verbal and numerical descriptors of the strength of DNA matches. This is clearly a very difficult task when the use of terminology is slippery or inconsistent. This raises the question of how this problem might be tackled. One mechanism might be for lawyers to find out, prior to trial, how particular descriptors will be used by expert witnesses, so that they can prepare their examination and cross-examination accordingly. Certainly, finding out pre-trial exactly what those verbal descriptors mean is important.

'Beyond reasonable doubt' and statistical analyses

Individuals from all research groups — lawyers, judges and forensic scientists — had problems reconciling probabilistic DNA evidence with the 'beyond reasonable doubt' standard of proof applied in criminal cases. Many research participants tried to give 'reasonable doubt' a numerical value. For example, one lawyer compared it with a 99.9% probability ratio.[38] Another compared it to the words 'extremely likely' on the verbal indicator scale.[39] This inherent scientific and legal balancing act was a consistent theme in the interview and focus group data in both jurisdictions.

Most interviewees commented on the use of DNA evidence as scientific evidence in legal settings. The concern with the standard of proof was evident in those discussions and demonstrates that this area of concern for practitioners mirrors the concerns in the case law discussed above in Chapter 2.[40] In *Forbes*[41] it was held that DNA evidence alone could provide proof beyond reasonable doubt but there

[38] Interview with L38 (7 September 2011).

[39] Interview with L2 (21 June 2011).

[40] See 2.3.

[41] *Forbes v The Queen* (2009) 167 ACTR 1.

was no discussion of how that proof is to be reasoned or explained from the evidence — only that it can meet this standard. In *Hillier*[42] the court held that if the State wishes to prosecute on DNA evidence alone, then logically that evidence itself must be proved beyond reasonable doubt. There was no discussion of what reasonable doubt means and the case law generally prohibits the judge from defining it.[43] Neither of these cases goes into any detail about how reasonable doubt is to be interpreted. However, *R v Cavkic*[44] is authority for the proposition that beyond reasonable doubt is not to be determined on a statistical basis. DNA evidence thus sits uneasily in this environment and lawyers find it difficult to reconcile decisional law principles with the way this evidence is presented as statistical probabilities.

An illustration of this difficulty is seen in an argument from lawyer L38, who suggests that the inability to say definitively that a DNA sample *is* that of an accused supports the proposition that a reasonable doubt can also be determined on a statistical basis. If faced with a statistical probability of 1 in a billion he believes that lawyers:

> then try to fit that in to the 99.9 repeating kind of model … And so, it's that interface between the way in which the conclusion is expressed which is really nothing to do with conclusion. It's just the underlining statistical science behind the conclusion.[45]

Further illustrating the connection lawyers make between probability ratios and the existence of a reasonable doubt is the following: 'I mean ... ultimately it comes down to a probability and the question is whether that can ever be beyond reasonable doubt when what you've got is just a probability.'[46]

One of the judges who took part in a focus group referred to an expert called by the defence in criminal matters who expressed very strong views about DNA evidence and its statistical basis. When this judge, P5, asked the expert why he had such strong views, the scientist responded he was worried about the reasonable doubt standard.[47]

The data discussed above suggest that lawyers, judges and forensic scientists make assessments about the weight of DNA evidence in relation to criminal standard of proof when it is presented as a probability ratio or statistical representation. It is legitimate for them to do so, because even though

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42 *Hillier v The Queen* (2008) 1 ACTLR 235, 245.

43 *Thomas v The Queen* (1960) 102 CLR 584; *Green v The Queen* (1971) 126 CLR 28.

44 *R v Cavkic* (2005) 12 VR 136.

45 Interview with L38 (7 September 2011).

46 Interview with L36 (20 June 2011).

47 Focus group with P5 (26 July 2011).

the weight of evidence is ultimately an issue for the jury, lawyers and judges may address the jury on that matter, encouraging them to take a particular view of its weight. The difficulty is that lawyers and forensic scientists have different perceptions about the weight of DNA evidence and its relationship to the beyond reasonable doubt standard. This is particularly problematic when the language used around probability ratios is inconsistent, apparently flexible and open to wide interpretation. The problem is compounded by the fact that courts have resisted defining 'beyond reasonable doubt' because that too is a question for the jury to determine. Although scientists have allegedly expressed concern about the standard of proof to the judges who participated in this research,[48] predominantly it was lawyers who had difficulty in this area.[49]

The decisional law[50] precluding judicial attempts to define the beyond reasonable doubt standard necessarily prevents judges and lawyers from couching it in statistical terms. So perhaps the best way to address at least some of the concerns about applying this standard of proof to statistical analyses might be to ensure consistency in the wording and expression used to present the strength of DNA results. Clearly, introducing a statistical interpretation of what proof beyond reasonable doubt might mean is not an option.

Intimidation

The data revealed that many lawyers are intimidated by or feel overwhelmed by DNA evidence. This is particularly the case where the numbers presented in forensic reports are higher than the current world population or where probabilities are expressed in billions. The intimidating nature of such statistical analyses leads many lawyers to view DNA evidence as unchallengeable. This obviously diminishes their confidence in their ability to challenge it. For some lawyers, there is a sense of hopelessness in challenging DNA evidence and the intimidation factor makes many lawyers feel that 'calling this evidence is a nightmare.'[51]

These views are illustrated by L12, who said that the numbers are 'deeply confusing when they are utilised and deeply intimidating. The intimidation factor is huge.'[52]

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48 Ibid.

49 See interview with L36 (20 June 2011); interview with L38 (7 September 2011).

50 *Thomas v The Queen* (1960) 102 CLR 584; *Green v The Queen* (1971) 126 CLR 28.

51 Interview with L29 (22 June 2011).

52 Interview with L12 (8 September 2011).

L31 expressed a similar view: 'I can't go beyond the fact that's saying that's bigger than the population of the world so that's got to be bad.'[53] Similarly, L12 referred to the numbers being so high that they were 'meaningless', with the result that, 'there's a high incidence of defence counsel just capitulating and facing those numbers.'[54] The tendency for numbers to be so large led some lawyers to express frustration with scientists with, for example, one participant viewing them as having 'no idea about the real world.'[55] L32 believed the numbers to be 'Google plex'[56] and considered scientists' reporting of statistics as, for example, 1 in 250 billion people to be 'ridiculous.'[57]

The intimidating nature of DNA evidence could result in differing responses to it. In some cases, lawyers regard it as determinative[58] and in others they treat it as highly suspicious.[59] Lawyers were also aware of the influence DNA evidence can have on criminal trial outcomes and their feelings of intimidation appeared to stem, in part, from this realisation.[60] The following statement by defence lawyer, L28, demonstrates these views: 'Well, the numbers are very intimidating and sometimes I know those numbers are in the millions or something rather than in the billions. They're terrifying.'[61]

The Vincent Report is critical of lawyers' failure to engage with DNA evidence more meaningfully.[62] This finding provides some explanation as to why lawyers have failed to challenge DNA evidence in the past, including in miscarriages of justice cases like *Jama*.[63] Lawyers are intimidated by what they refer to as 'ridiculous' numbers. This viewpoint may also provide insight into why they fail to engage more meaningfully in education initiatives[64] and discussions with experts on DNA evidence. If they are intimidated by the numbers they are less likely to actively engage with others to use the numbers and DNA evidence for the purposes of improving their criminal law practice.

There are potentially serious consequences for both defendants and the criminal justice system if lawyers avoid challenging DNA evidence because they are intimidated by probability ratios that

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53 Interview with L31 (28 September 2011).

54 Interview with L12 (8 September 2011) referring to the statistics and probability ratios used in DNA evidence.

55 Interview with L32 (22 June 2011).

56 Referring to the high numbers being generated by DNA evidence results.

57 Interview with L32 (22 June 2011).

58 Interview with L28 (28 July 2011); interview with L27 (21 June 2011); interview with L17 (27 July 2011); interview with L1 (23 June 2011).

59 Interview with L28 (28 July 2011); interview with L20 (25 July 2011); interview with L4 (25 October 2011).

60 See interview with L12 (8 September 2011) and interview with L3 (6 September 2011).

61 Interview with L7 (28 July 2011). See also interview with L12 (8 September 2011) and interview with L3 (6 September 2011).

62 Vincent Report, above n 4, 32–39.

63 *R v Jama* [2008] VCC 0886.

64 See Chapter 7: Educating lawyers about DNA evidence.

generate large numbers. There are scientific explanations for the expression of probability ratios in the words that are used. Lawyers need to understand what the terms are, what they mean and elucidate these explanations for juries so that they, too, accurately understand the strength of the DNA evidence. If lawyers do not engage with DNA evidence because the numbers 'are just too big', there is the risk of wrongful convictions in cases where DNA evidence may have been deposited in some manner other than that alleged by the prosecution if this possibility is not exposed effectively to fact finders.

6.2.2 Mixed profiles

As DNA technology becomes more discriminating, smaller and smaller traces are collected from crime scenes and the testing measures used can pick up more than one person's DNA profile at a time. Mixed profiles are increasingly being found in samples of DNA taken from crime scenes. As noted by one of the lawyers interviewed, mixed profiles are often classified as 'prejudicial evidence'.[65] This is because the assumptions made about the number of contributors and those contributors' profiles as compared to the general population are problematic and the statistics and mathematics involved are very complicated.[66] One of the judges interviewed questioned how far mixed profiles could be taken, because the results may allow you to 'come up with almost anybody if you want to construct a theoretical DNA profile.'[67] Lawyers find mixed profiles hard to question and hard to challenge. The increasing use of mixed DNA profiles in criminal trials has escalated lawyers' levels of confusion and their difficulties in dealing with DNA evidence. This confusion is evidenced in the quotes below:

> But mixed samples will continue to create difficulties**,** particularly about what comes out of the statistical analysis.[68]

> once you get mixes into the mix then it becomes very difficult, but it can be very persuasive.[69]

> But there's always this sense of alarm bells when you get mixed samples. Generally, lawyers are never really going to understand the actual testing technique.[70]

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65 Interview with L29 (22 June 2011).

66 For further discussion of the problems arising from the interpretation of complex mixtures and incomplete profiles see Peter Gill, *Misleading DNA Evidence: Reasons for Miscarriages of Justice* (Academic Press, 2014) 4.28 and lawyers' role in pushing for the testing of smaller samples in Erin Murphy, *Inside the Cell: The Dark Side of Forensic DNA* (Nations Book, 2015).

67 Focus group with P4 (3 May 2011).

68 Ibid.

69 Interview with L11 (24 June 2011).

70 Interview with L20 (25 July 2011).

The issue taken with mixed profiles is further described by L18 who says that 'mixtures are complicated: how they are calculated, how they're worked out; it's all hard.'[71]

L20, a defence lawyer, expressed distrust of mixed profiles. He said that he hears 'alarm bells when you get mixed samples' and believes that, 'it's suspicious that the numbers can be so high but not 100%, and lawyers are never really going to understand the actual testing technique, let alone with two profiles.'[72]

The difficulties that lawyers in this research have had with mixed DNA profiles are echoed in statements of Higgins CJ in the 2011 ACT Supreme Court case, *Meyboom.*[73] With constantly improving technology it is likely that there will be trace evidence found in increasingly smaller biological samples with increasing discrimination of DNA profiles found for multiple contributors. Mixed profiles are likely to become ever more complicated escalating lawyers' difficulties in coping with such evidence.

6.3 Difficulty with pre-trial procedure

The second area where lawyers noticeably have difficulty with DNA evidence is in respect of both pre-trial and trial procedure. Pre-trial, the major difficulties encountered fell into three main categories: first, the difficulty of identifying errors in the forensic process; second, a failure to investigate or challenge the evidence prior to the trial because of a lack of knowledge and confidence with DNA evidence; and, third, difficulties in detecting possible contamination of DNA evidence.

During criminal trials lawyers struggle in different areas, including in effectively examining and cross-examining experts and coping with an apparent blurring of the boundaries between the roles of the expert witness and the lawyer. These concerns will be addressed and explained below at 6.4, with the words of lawyers, judges and forensic scientists used to illustrate these themes.

6.3.1 Identifying errors

Although many lawyers claimed to understand the basic science behind DNA evidence, very few knew how to identify errors in laboratory testing or the collection of DNA evidence at a crime scene or police station. Lawyers had a common difficulty in finding out how to ensure DNA evidence is reliable.

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71 Interview with L18 (26 October 2011).

72 Interview with L20 (25 July 2011).

73 *R v Meyboom* [2011] ACTSC 13. A discussion of this case and the legal implications of Higgins CJ's judgment may be found in Chapter 2.3 at 27-28, but Higgins CJ essentially found that if there are a number of mixed profiles taken from a sample and few people can be excluded because of that, then the probative value of the evidence decreases.

Many compared their practices in dealing with these difficulties to a 'fishing exercise', sometimes undertaken 'in the forlorn hope that something odd might emerge ... potentially days of exploration in this forlorn hope.'[74] Some felt defeated by these difficulties. So, for example, even a fishing exercise was not something that L12 felt capable of performing. He stated that it was hopeless to expect lawyers to uncover forensic errors given that in *Chamberlain*[75] there were very senior lawyers, some of whom were QCs who, despite their forensic endeavours did not uncover the failures to supervise the scientific 'experts' or maintain proper records. The failure to uncover errors in *Chamberlain* occurred from the first trial all the way through to the High Court appeal. This led L12 to conclude that 'the trial process has not been very successful in unmasking these sorts of problems, in Australia at least, or in England.'[76]

Difficulties in detecting deficiencies in the evidence from scientific reports

Inevitably, an element of trust is extended to experts — their qualifications and the tests that they conduct on DNA evidence. The lawyers interviewed felt that it is too difficult, if not impossible for lawyers to detect issues from a forensic report:

> Particularly cross contamination and transference, and a lawyer won't be able to read that in the subpoenaed notes. You have to think a little bit creatively about whether that's possible or not and it's difficult and I don't know how it is you're supposed to raise the possibility of something which may or may not happen.[77]

Lawyers were open to analysing the forensic reports but if there were errors at the crime scene or in the laboratory then the information presented in the reports is unlikely to indicate those possibilities.[78] The following statement by L32 illustrates lawyers' difficulties in probing into or questioning the results given in forensic reports:

> For lawyers, there's a report that says X and they've got no idea [about] the process by which X is achieved. So, you can't do anything except say okay then. It's like, maybe a lot of this electronic stuff, I have no idea how or why, so all I can do is just say 'Oh okay'.[79]

The NAS and Vincent reports recommend ongoing legal and scientific education to improve lawyers' knowledge of DNA evidence with the aim of improving their ability to detect errors in this evidence.

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74 Interview with L12 (8 September 2011).

75 *Chamberlain v The Queen (No 2)* (1984) 153 CLR 521.

76 Interview with L12 (8 September 2011).

77 Interview with L18 (26 October 2011).

78 Interview with L30 (20 June 2011).

79 Interview with L32 (22 June 2011).

If, however, the information needed to make an adequate assessment of the evidence or the scientific procedure involved is not provided in forensic reports, then a lawyer's task in this regard may be insurmountable or, at least, appear to be so.

If lawyers feel uneasy about, or incompetent in, uncovering errors then they are less likely to challenge DNA evidence or even investigate its authenticity. This is clearly problematic when there is a risk of wrongful conviction because of reliance on flawed DNA evidence. It may not be possible for lawyers to detect potential weaknesses in DNA evidence from the information provided in forensic reports alone. This difficulty may partly be overcome by increasing the communication between lawyers and experts. Lawyers do not need to rely solely on forensic reports to interpret or understand the evidence. They can obtain assistance from scientific experts. However, self-imposed barriers may prevent lawyers from seeking such assistance as, for example, where they choose not to engage with scientists for tactical reasons (discussed above in Chapter 5[80]). This approach will deprive lawyers of a potential source of information that they may need in order to uncover possible sources of error in the collection and analysis of DNA evidence.

Crime scene investigators constitute another possible source of relevant information. Lawyers might question the experts and/or investigating officers to determine whether there is the risk of error. To do so effectively, of course, they must have a sound working knowledge of the best practices that apply to the collection, storage and analysis of DNA evidence. This will ensure that they can ask appropriate questions about what has occurred in individual cases and then usefully assess the implications for the reliability of DNA evidence of the answers they receive. The possibility for lawyers to gain access to files compiled during the course of investigation and analysis is considered at 5.3.2.[81]

6.3.2 Investigating and challenging DNA evidence pre-trial

The difficulty associated with investigating and managing DNA evidence pre-trial was a concern raised predominantly by defence lawyers. If defendants categorically deny involvement in the crime with which they have been charged, lawyers are required to question the evidence more closely. It is a truism that it is in the interests of the defence to find errors or weaknesses in evidence adduced by the prosecution. However, this can be a peculiarly difficult task where DNA evidence is concerned because of its apparent unassailability. Several lawyers commented on how difficult it is to investigate, with a view to later challenging, a seemingly 'unchallengeable' type of scientific evidence, particularly

[80] See above at 5.7.4 but also p 111, 121, 131 and 133.

[81] See above at p 115.

one that has been accepted by the courts as credible evidence for over 30 years.[82] The degree and types of challenge have changed in recent times. As one of the judges who participated in one of the focus groups explained:

> I think what's happened is that DNA was so abstruse that initially everyone just accepted what the experts said; then it became accepted and now it's being challenged much more. We've got over the early challenges, and now it's being more forensically challenged.[83]

There are varying degrees and sources of ambivalence about challenging DNA evidence. One defence barrister (L19) expressed the view that lawyers should not 'out-science the scientist'[84] by appearing to have knowledge about the more complex aspects of DNA evidence. L19 also said that the greatest question is whether to challenge the evidence at all.[85] Another interviewee, L22, felt that there would only be 'one, two or three lawyers [who] would ...even try to question DNA evidence, [rather] they would all more or less accept it.'[86]

Lawyers identified the length of time the sample has been at the crime scene and whether external factors such as rain, temperature and the other elements may have affected the evidence as potentially offering areas for questioning at trial. However, uncovering and exploiting any possible negative impact of even such mundane factors, entails a degree of scientific understanding and engagement with pre-trial investigators and forensic experts.

To challenge DNA evidence effectively, a lawyer must understand the processes and procedures utilised in the collection and analysis of it. In this regard one prosecutor noted,

> a lot of being able to present DNA evidence in a succinct and a comprehensible way effectively, usually kind of requires all the parties to be on the same base as to the process of collecting and testing for DNA evidence and knowing the procedures that are followed and so on.[87]

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[82] Interview with L5 (26 October 2011); interview with L6 (7 September 2011); interview with L19 (26 July 2011); interview with L12 (8 September 2011), interview with L3 (6 September 2011); interview with L32 (22 June 2011); interview with L35 (28 July 2011); interview with L37 (24 June 2011).

[83] Focus group with P2 (3 May 2011).

[84] Interview with L19 (26 July 2011) who said that lawyers who read textbooks about DNA evidence and then proceeded to ask obscure questions of forensic scientists were trying to 'outsmart' those actually qualified in this area to make them look poor on the stand.

[85] Interview with L19 (26 July 2011).

[86] Interview with L22 (20 June 2011).

[87] Interview with L36 (20 June 2011).

Defence lawyers[88] suggested that it is increasingly difficult to challenge any aspect of DNA evidence because of the difficulty in finding alternative experts from whom to obtain advice. For example, L12 believes there to be a 'dearth of people who can really inform defence counsel about what they should look at and what they should ask about'.[89] Because of the principle that there is no property in witnesses,[90] defence lawyers may, subject to certain conditions, properly seek information from any potential witness. Accordingly, defence lawyers do not need to engage a 'defence' expert to understand DNA evidence in more detail, or to investigate it with a view subsequently to challenging the evidence in any given case. Yet, only two defence lawyers stated that they can and do talk to State organisation or police-based forensic scientists.[91] However, they also noted that there are systemic and tactical decision-making considerations that affect whether they do so or whether, instead, they actively avoid talking to State experts.[92] Such tactical considerations primarily involve not disclosing defence arguments to prosecutors and 'State' witnesses before trial.[93] Some were just too intimidated by or scared of the evidence to investigate or question it pre-trial, for fear of looking ignorant or because they lack understanding of how to do so.[94]

This finding supports the research discussed in Chapter 3 as it demonstrates that lawyers acknowledge their lack of understanding and lack of confidence in challenging DNA evidence. It goes further by providing an additional explanation as to why defence lawyers avoid challenging DNA evidence and talking to experts. As detailed in Chapter 5, sometimes this is because they do not want to 'give away' their case to the prosecution or to forensic scientists whom they consider to be essentially the 'property' of the State. Sometimes, it is because they do not feel that they have the same level of access to those experts.[95] For some lawyers, as the data in this section show, it is because they do not

88 See interview with L17 (27 July 2011); interview with L1 (23 June 2011).

89 Interview with L12 (8 September 2011).

90 *Harmony Shipping Co SA v Saudi Europe Line Ltd* [1979] 1 WLR 1380, 1384.

91 Interview with L7 (28 July 2011); interview with L27 (21 June 2011).

92 Interview with L27 (21 June 2011). Also see 5.7.4: avoiding experts and trial by ambush.

93 See for example interview with L30 (20 June 2011) who stated 'we generally don't try [to talk to state DNA experts] because what's the point in talking to the expert on the prosecution side because you're going to flag the issues that you want to raise and you might not want to flag those in advance.' See also interview with L35 (28 July 2011): 'it is an adversarial [system] ... I would be very careful, very, very careful about playing my hand.'

94 For example, interview with L3 (6 September 2011): 'A lot of people are just a bit too scared to do anything other than just let it go through.' Also, see interview with L32 (22 June 2011) and interview with L6 (7 September 2011).

95 See interview with L31 (28 September 2011): 'I would not feel I would have the right to that sort of access. I feel I'd have to go through the prosecutor and the informant with any questions I had and they're not my witness.'

have sufficient confidence in their ability to do so. The lawyers in *Jama*[96] failed to challenge the DNA evidence that placed Jama at the scene of the crime and this resulted in a guilty verdict for the charge of rape. The defence lawyer did not actively seek to challenge the DNA evidence and instead explored other explanations of why Jama's DNA may have been on the victim.[97]

Challenges facing lawyers during the trial are discussed in more detail further below.[98]

Focus groups with forensic scientists revealed that experts are surprised about lawyers' failure to communicate with them pre-trial. They expressed this surprise both in relation to prosecution and defence lawyers. Some forensic scientists revealed that they had only ever had one or two pre-trial conferences with lawyers in over 80 cases:

> I've done it I think once in maybe 82 something court trials. Well actually I'll clarify that. I've had it once where it has been properly organised, informally in an office, days before the actual court trial.
>
> The other pre-trial conferences I have had are where the Prosecutor will rush out the door two minutes before you're due on the stand and do a conference. As far as a formal conference [goes], [I have had] one and it was a complex BPA job and it was excellent and it was really good to just explain what I will be able to say and what I won't be able to say. You can see how it had a really positive impact on the lines of questioning when I got on the stand. It actually made life significantly easier for me because I wasn't going in cold … I had sort of a good platform to start from … but I think fundamentally I was able to construct better answers. So, I think from that perspective it would have been better for the jury because I had a better grip on what was in contention. But that's once.[99]
>
> The ideal thing is just for them to want to meet to go through it thoroughly and then to give you a heads up if anything changes in the meantime. [Also it is important] to keep in contact with you particularly if it's a big case. Then in the actual witness box go through very methodically [and] logically [your evidence, asking short] questions or questions with [short] answers. Very, very few lawyers do this though — I really don't understand why.[100]

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96 *R v Jama* [2008] VCC 0886.

97 The cross examination of the DNA expert Ms Pamela Scott was conducted by defence barrister Ian Crisp on 16 July 2008, 37 (line 2) — 96 (line 9) of the transcript.

98 See 6.4 at 163 below.

99 Focus group with FS12 (25 October 2011).

100 Focus group with FS2 (4 June 2011). See also focus group with FS6 (25 October 2011): 'but then they still have enough time to bother you for your notes and for methods and all that crap that they don't half the time end up using but then they don't have time to talk to you.'

6.3.3 Contamination

Most of the lawyers interviewed for the study had a good understanding of contamination in general terms and how to be satisfied that there was continuity of samples in the laboratory.[101] Nevertheless, lawyers stated that they did not know how best to expose contamination of the kind that occurred in *Jama*, even though the cause of the contamination in that case was uncomplicated. Accordingly, while lawyers are aware of the potential for contamination in their cases, they find it difficult to envisage how they might identify whether this has occurred in practice. One of the defence lawyers explained this difficulty as follows:

> How are you going to find that anomaly, what sorts of questions do you ask to get somebody to admit, "yeah we don't always wash our bench tops". I mean who would have thought to say tell us what your protocol for cleaning the laboratory desktops is, and did you do it on that occasion, can you absolutely swear to the fact that you or Fred did it?[102]

Their capacity to do what is discussed in this quote is, moreover, restricted by the fact that they do not fully understand where in the process of the collection and analysis of trace evidence contamination may occur. This is illustrated by the following quote:

> also, just in terms of how to go about that, well, I'm aware that there can be potential for contamination or things like that. It's not necessarily obvious which points of the process are contentious points and where it is that we should be focusing our attention and, often, there have to be a lot of forensic decisions made in a matter before it gets to trial. Like you need to turn your mind to that at an early stage and you don't normally have counsel engaged till later in the process and while counsel might have a lot of the experience you need in relation to DNA, you really need that experience closer to the start of the proceeding, rather than the end of the proceeding.[103]

Another restraint on their ability to distinguish a real prospect for contamination is the dearth of information provided to them about the processes utilised in the collection and analysis of the DNA samples. Consequently, lawyers questioned why it is difficult to obtain information about the practices employed to ensure the continuity of samples and, indeed, about all the procedures utilised throughout the DNA collection and analysis processes in the cases on which they work:

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[101] Continuity of samples means ensuring that a sample goes from a crime scene to a laboratory and then into and out of storage as it is tested. This is important for ensuring that contamination does not occur, either by those testing the sample or between other exhibits in the laboratory. Also see 5.3.2 at 115 for further discussion of continuity, transference and contamination issues.

[102] Interview with L12 (8 September 2011).

[103] Interview with L13 (27 July 2011).

> It can sometimes be very difficult to actually establish continuity if there are a number of different samples and a number of different tests being made. So, the first thing I'd raise is this kind of simple issue of why is it so difficult? Why is it so difficult for a defence lawyer to be able to trace continuity; continuity should be a given. Police can either establish it or not. You would expect it to have proper decisions and they should be able to establish it. There should be the whole exercise of confirming continuity of an exhibit that is relied upon for DNA testing. It shouldn't be as difficult as it is, in my view.[104]

It is also important to acknowledge at this point that the problems in *Jama* could not have been uncovered simply by looking at the forensic file in his case. Defence counsel and defence experts would have been highly unlikely to identify the possibility of cross contamination and transference simply by examining the subpoenaed notes. Detailed information about the agency's cleaning procedures was needed. Also, the lawyers involved in this case needed to be alive to the dangers of cross-contamination from the earlier sample taken from Jama. Their concerns in relation to this sample lay elsewhere — in preventing the jury from learning about its existence and becoming aware of his involvement in another criminal investigation.

The findings discussed here accord with comments made in the Vincent Report about lawyers' inability to identify contamination and challenge DNA evidence in a way that ensures that there has been no contamination of the sample in their case. Contamination has been identified by lawyers as an area of perceived difficulty. In practice lawyers find it hard to gain access to all the information they might need to detect possible contamination. If lawyers find contamination easy to understand but difficult to uncover, there remains the risk of contamination in criminal trials leading to wrongful convictions.

6.4 Procedural difficulties during trial

Lawyers participating in the study spoke of their difficulty in managing DNA evidence during the criminal trial. This discussion will focus on two of the most common areas of concern. The first is the process of examining and cross-examining DNA experts. The second relates to the problem encountered by a few lawyers of delineating with some degree of certainty the roles and responsibilities of counsel and expert witnesses in the presentation of this evidence. Many lawyers in the study spoke of there being a blurring of the boundaries in this regard. The issue here is to what extent do and should lawyers assign responsibility to expert witnesses for ensuring that the evidence they give is complete and comprehensible.

[104] Interview with L28 (28 July 2011).

6.4.1 Examining and cross-examining experts in court

It is at this stage of the process that we see all the deficiencies in lawyers' knowledge and the difficulties experienced in the pre-trial stage coalesce. Those deficiencies and those difficulties largely cause the problems that occur at this stage of the process. The problems arise in both examination and cross-examination of expert witnesses. This means that the party calling the witness does not elicit that evidence satisfactorily and the opposing party does not challenge it adequately.

These problems are exemplified in expressions of frustration made by forensic biologists who believe that they have been hampered in giving clear, complete and cogent evidence because lawyers do not ask them the right questions.

These problems also manifest themselves in the ways that lawyers approach the questioning of expert witnesses on DNA evidence. Lawyers calling the expert witnesses largely abrogate responsibility for adducing their evidence clearly, cogently and completely to the witnesses themselves. Opposing counsel may simply abandon the field. They have not previously felt able to identify any potential areas of weakness in the evidence and, at trial, they do not feel adequately equipped in terms of knowledge or information to test the evidence before the fact finder. So, it remains in no small measure untested.

Expert witnesses' frustration and their view that lawyers do not understand what questions to ask to elicit their evidence in examination-in-chief in a manner that enables fact finders to assess its weight accurately, is exemplified by the following quote from one forensic scientist:

> when you're being led through your evidence and you're being asked questions that don't make sense technically … you feel like you're scanning around and or rephrasing it and ... your evidence becomes more ineffective.[105]

[105] Focus group with FS2 (4 June 2011). FS2 also said: 'We that's right and what was really frustrating on the stand is when you get a prosecutor or the defence, it doesn't matter. … when they're asking you questions they obviously don't understand, they're asking you in way where you come across as obstructive or whatever it is because you have to keep saying, look, I can't answer it that way or rephrasing their questions.' See also focus group with FS1: 'Yeah, and even in the cross [she] was sort of trying dig her way [out of it], I guess and it came across that way and the judge in that instance actually stepped in and sort of helped me because I was struggling to answer her questions in a way that was actually clarifying anything, we were just getting further and further down this whoa, don't want to go there track' (4 June 2011); focus group with FS9 (25 October 2011): 'Some of them seem to have a lot of knowledge though. I have had ones who get up there and ask all kinds of things about procedures, some of them are really good … that walk you all the way through … and then you get to the opposite end where I've had lawyers who've got you on stand and immediately said what were the DNA results and the judge has interjected and said you think we can ask her what DNA is first and the judge has actually led me through my evidence rather than the prosecutor, because the prosecutor was a bit hopeless. And then you get the opposite where they ask you all the right questions

Forensic scientists and judges in both jurisdictions included in the study expressed the view that prosecution counsel have less understanding of DNA evidence than defence counsel. This is illustrated by the following discussion by one of the groups of forensic scientists that took part in this research:

> FS2: and I think it takes away a lot from our evidence when we're battling with the lawyers and usually …
>
> FS4: Particularly the prosecutors.
>
> FS2: usually it's prosecutors.
>
> FS1: Yeah
>
> FS4: Particularly.
>
> FS2: I find that prosecutors are the worst.[106]

The consequences identified by forensic scientists are that prosecutors concede to defence challenges too readily and fail to ask pertinent questions or to remediate defence challenges in re-examination, which then leaves a level of uncertainty about their testimony. This is illustrated by the following statement:

> I think that's where some prosecutors let themselves and their cases down because by not understanding it enough they concede sometimes too easily and they don't ask questions; they don't re-examine or they don't use tools that they have got where they can use it in the courtroom to their advantage …[107]

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and almost get too technical and start saying, well what is DNA type and allele and introducing too many terms all at once. It can be quite frustrating and you get the full range of questions, both poor and too technical.'

[106] Focus group with FS2 (4 June 2011). Focus group with FS10 (25 October 2011) also contained the following: 'a lot of prosecutors that I've found have just thought oh well, you know, we'll take care of it. In the end they don't have to understand the science and the stats so much and with the defence lawyers they're really on top of what's going on, which I found, I guess, frustrating sometimes because the defence will put up some ridiculous arguments or you know start badgering us and the prosecutors are just, get switched off, sitting back.' Also see focus group with FS5 (25 October 2014): 'to tell you the truth, I've had a lot more defence lawyers that are on top of everything than when I had prosecutors.'

[107] Focus group with FS2 (4 June 2011). See also FS6, FS8, FS9 and FS10 (25 October 2011) with the exchange below:

FS6: Because you're depending on them to ask you the right type of questions to get the right information out, so they need to know to guide you to the jury, does that make sense?

FS10: I guess that's the frustrating [part], especially if the defence are on top of what's going on and the prosecutor isn't and the defence are trying to imply certain things by asking certain questions and then the prosecutor just sits there and …

FS9: Isn't saying anything.

In relation to the approach lawyers adopt to questioning DNA experts in court — in eliciting evidence in examination-in-chief, a number of lawyers stated that they viewed their responsibility to be leading the witness competently through their evidence. This view essentially devalues the desirability of understanding that evidence themselves. So, for example, L9 said 'it probably doesn't matter at the end of the day whether you understand precisely how they're getting to the bottom line if you can lead them through the evidence.'[108]

The problem with this approach is that the lawyers may then not be alive to any deficiencies, anomalies or inaccuracies in the evidence that has been presented. It means that they may fail to identify features of the evidence that may warrant clarification, further explanation or even re-expression in, perhaps, more readily available terms for the jury. The problems associated with how lawyers' view their own and expert witnesses' roles in communicating the evidence to fact finders, is explored in greater detail in the next section, because it is an issue of individuated significance.

An important aspect of the failure to ask appropriate questions is lawyers' lack of understanding about the limits of the expert witnesses' knowledge, which may define what propositions they can or cannot agree to, what explanations they can provide and how far they can go in assisting the determination of facts in issue. So, in focus groups, forensic scientists expressed the view that lawyers did not have,

> [a]n understanding of the boundaries of our knowledge and so therefore what extent we can go to with answering questions. And I know we always can say that's beyond my area of expertise but I guess if they had an understanding of that, perhaps you wouldn't get those questions that then start to make you feel like you're not the expert you're there to be because once you start saying that's beyond my area of expertise, how many times can you say that before they go well, what are you an expert in?[109]

Notwithstanding the view that defence lawyers are more knowledgeable about DNA evidence than prosecution lawyers, forensic scientists were also of the view that the failure to ask 'the right questions' was also evident in cross-examination (usually the defence is the cross-examining party).

FS10: yes, and doesn't respond or doesn't follow up on it. I think they are the most frustrating court [trials] that I've ever had is where the defence are implying something [and they] can ask you all these questions going down a certain line and what they're asking you, you have to say it's a possibility but it's not the most likely explanation for the DNA evidence. But the prosecutor never asks you [the right] questions …

FS6: And you can't just say it without being asked.'

[108] Interview with L9 (7 September 2011).

[109] Focus group with FS11 (25 October 2011).

The following statement from L12 compares the role of the defence in challenging DNA evidence with the relative ease of the prosecution role in adducing it:

> It's easy enough prosecuting. You simply adduce the evidence. The experts are on top of their area. We all know what they can and can't say. They mustn't engage in the prosecutors' fallacy and they know in general terms how to communicate that which can be communicated. So, in adducing it as a prosecutor it's fine.[110]

A recurring theme in relation to the difficulties facing cross-examining counsel is the unequal positions of the defence and the prosecution, with the prosecution having expert advice available to it and the defence often having to cope with a dearth of available, alternative expert assistance in challenging the evidence appropriately and effectively. In the words of L12, when describing the difficulties counsel experience in discharging their responsibilities, 'to sniff out where there might have been some anomaly or technical deficiency' in the evidence[111] '[i]t's almost wholly dependent upon an expert providing some guidance and as I've said there's very few of them.'[112]

In the absence of alternative experts available to defence counsel to help them improve their understanding of DNA evidence, defence lawyers feel ill-prepared to cross-examine prosecution or State forensic scientists. As a result, they find it 'deeply intimidating'.[113]

Another example comes from L37 who said, 'how do you cross-examine something you don't understand?'[114] Quite clearly what is being lamented here is a lack of adequate knowledge about DNA evidence.

Cross examination in these circumstances can leave counsel perplexed about how to elicit comprehensible information for the jury: 'How to ask the right questions and how to also put yourself in the shoes of the jury and work out what's going to be going over their head and what's not is the most difficult thing.'[115]

Some lawyers, like L19, therefore, view the task of whether to cross-examine DNA experts at all as being one of the 'greatest questions ... of all.'[116]

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[110] Interview with L12 (8 September 2011).
[111] Ibid.
[112] Ibid.
[113] Ibid.
[114] Interview with L37 (24 June 2011).
[115] Interview with L3 (6 September 2011).
[116] Interview with L19 (26 July 2011).

What is manifest from the analysis here is that the tasks of eliciting evidence in examination-in-chief and challenging it in cross-examination are hobbled by lawyers' lack of understanding of that evidence and by what they don't do or consider that they can't do pre-trial to learn about the evidence in their case. These tasks are also hampered by their perceptions of the impenetrability of the evidence and the degree to which it is 'bullet-proof'.[117]

The role of the defence lawyer was often interpreted by defence lawyers in a tactical way — some felt that their role was to confuse the jury and make the DNA evidence 'bamboozling, baffling science that is impenetrable, that's what the defence lawyer has got to do.'[118] Similar tactics in presenting the evidence were also espoused by another defence barrister, who does not like to go through 'DNA evidence 101' with the jury, and in fact prefers to make the evidence seem as complicated as possible so that the jury does not take the evidence into account.[119] The objective of these lawyers in relation to DNA evidence that linked the accused to the crime, is to reduce the impact of that evidence by making it seem incomprehensible or so confusing that the jury may simply disregard it.

Defence lawyers' hesitancy to cross-examine forensic biologists has implications for practice as the process of cross examination is heralded as being one of the 'greatest legal engines ever invented for the discovery of truth.'[120] A lack of knowledge on how to find the anomalies or technical deficiencies then becomes an inability to cross-examine in a competent manner, and the expert evidence is not tested thoroughly and challenged adequately. Cross-examination is arguably the best method of uncovering the truth, as Wigmore argues,[121] but not if lawyers dread the process, feel intimidated by cross-examining DNA evidence and avoid having to challenge the evidence in their criminal trials.

6.4.2 The roles and responsibilities of lawyers and experts — blurred boundaries?

One of the predominant themes to emerge from the data was confusion about the roles of lawyers and experts in presenting DNA evidence during examination-in-chief and re-examination. The confusion arises from the divergent views lawyers have about their own and experts' roles in these questioning sessions. As discussed below, forensic scientists see their role as responding to the questions of lawyers about the evidence they have collected, analysed and/or interpreted — not explaining how their evidence applies to the trial at hand.

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[117] DNA evidence was seen as 'bullet proof' by L28 (28 July 2011).

[118] Interview with L19 (26 July 2011).

[119] Interview with L27 (21 June 2011).

[120] John Wigmore, *A Treatise on the Anglo-American System of Evidence in Trials at Common Law* (Little Brown, 3rd ed, 1940) 3.

[121] Ibid.

Judges, forensic scientists and some lawyers interviewed consider that lawyers have a responsibility to bring a sound knowledge of DNA evidence to bear on the task of adducing evidence from DNA experts. In contrast, some lawyers expressed the view that lawyers need to know only enough to ask simple questions of experts who then have the responsibility to make this evidence intelligible to a jury. The concern is that, in the absence of a consensus about who has responsibility for what in the presentation of DNA evidence in court, that evidence may not be provided in the most lucid form for fact finders.

The approach of lawyers who take a minimalist approach to their own role was encapsulated by L3: 'But really, it's a matter of the experts, they're the experts. I think lawyers sometimes try to be experts and I don't think they can be.'[122]

To similar effect L25 expressed the view that it is the role of the expert to explain DNA evidence and that the role of the lawyer is to ask questions that elicit the most important information:

> All you've got to do is make sure that everybody understands. So, what, why, how, when questions, will explain that. Well that's all an advocate really needs to do. The expert should be able to do the rest.[123]

Lawyers have a great responsibility to ask questions that will elicit the expert's evidence in the best possible form to maximise fact finders' understanding and appreciation of it, and to ask the right questions lawyers need to have the right information and level of understanding about the evidence. L36 sees this as a two-way process:

> I think there's a fair bit of responsibility on the lawyer because an expert, like any witness, can only answer the questions that are put to them ... They do scientific analysis fulltime. They're scientific experts ... it's up to the lawyer to ask questions and to delve further so, if the experts are talking about things in a way that isn't easy to understand, the lawyer does have the responsibility to bring them back and break those concepts down into a way that can be easily understood.[124]

The overall view was that lawyers need not have an understanding of DNA evidence that rivals that of forensic biology experts, but that they should have enough understanding of the evidence to address informative and appropriate questions to the expert before trial and during both examination-in-chief and cross-examination. Freckleton, Reddy and Selby's research supports this finding in suggesting

[122] Interview with L3 (6 September 2011).
[123] Interview with L25 (8 September 2011).
[124] Interview with L36 (20 June 2011).

that, although many judges are content with the quality of the advocacy in their courtrooms, where expert evidence is concerned, there are many who are dissatisfied both with the advocacy of the lawyers and with the role played by the experts.[125]

The risk of asking questions without understanding either the question or the answer may also result in evidence that does not advance the State's or the defendant's case, or that complicates the case to the point where it no longer assists the trier of fact in their decision making.

DNA evidence that is confused by ineffective questioning of an expert by either the prosecution or the defence in a criminal trial does not contribute to a case as strongly as it might have if presented competently. Ineffective questions prevent the trier of fact from fully understanding the issues and evidence in the case. If there have been any problems in the collection or processing of the DNA evidence and this has not been detected before it gets to the courtroom, then it is the role of the lawyer to prevent a miscarriage of justice from occurring. If they cannot competently interrogate the evidence, the DNA results may be given more weight than they deserve, or in the alternative, they may be undervalued by the court because they have not been used to their full potential. Both these outcomes are not ideal for the criminal justice system.

Lawyers of course understand that experts necessarily have a greater knowledge about DNA evidence than they.[126] However, DNA evidence appears to be an area of expertise where there are particularly disparate knowledge levels between lawyers and experts.[127] Inevitably, the nature of the role lawyers assume in eliciting DNA evidence will be determined by the amount of time they can devote to preparation of the case. In reality, as seen in Chapter 5, more often than not lawyers have limited time to prepare evidence for criminal cases.[128] As noted there, cases are always changing and as L3 noted it might be 'DNA one day and ... other evidence on another.'[129] So while lawyers may have a desire to understand the evidence fully, limitations of time may confine the role of the lawyer (specifically the prosecutor) merely to providing the expert witness with the opportunity to present and explain the DNA evidence to the jury.

The prosecutor's role is to adduce DNA evidence from expert witnesses during examination-in-chief and later to re-examine these witnesses after they have been cross-examined by the defence.

[125] Freckelton, Reddy and Selby, above n 11.

[126] Interview with L12 (8 September 2011).

[127] Ibid; Interview with L26 (8 September 2011), Focus group with P2, P3 and P4 (3 May 2011).

[128] See 5.6: the nature of working on a case-by-case basis.

[129] Interview with L3 (6 September 2011).

However, forensic scientists participating in the study complained that many prosecutors failed to re-examine them on contentious points and conceded defence points too readily.

L19 drew a distinction between their responsibilities in relation to DNA evidence at the pre-trial stage of proceedings and subsequently at trial:

> I think it is very important for a lawyer to know a lot about DNA *pre-trial*, I don't think it is necessarily important for the lawyer to know much about DNA in the courtroom, because I'm assuming that if the lawyer has done his or her work properly and there's been a problem with the DNA in the pre-trial process then it will be excluded either by agreement or by order. … so, I'm assuming that if you get to a point where the DNA is being admitted into evidence it's been through that process of scrutiny beforehand. You shouldn't necessarily get into a criminal trial and then start to, 'oh shit DNA what are we going to do about it now?' It's too late. Should a lawyer have a scientist's understanding? No.[130]

Such views have implications for lawyers' approach to the acquisition of knowledge about DNA evidence. They indicate that there is a lack of consensus about how much lawyers should know about DNA evidence. Many lawyers and forensic scientists believe that lawyers should know about more than just the basics of DNA evidence and that this is required if they are to ask experts the most appropriate questions in court. In practice, if lawyers do not feel it is their role to understand DNA evidence beyond being able to ask basic relevant who/what/when/where/why questions of experts, then they may not attempt to improve their knowledge beyond elementary procedural requirements of proofing an expert. Experts can only answer the questions lawyers put to them in court and the concern is that if a lawyer does not have the knowledge that allows them to ask the right questions of experts, then the court may be left without the most robust and accurate account of the DNA evidence in any given criminal trial.

6.5 Difficulty with communication

The third most common area of difficulty has been categorised into the theme of 'communication'. This covers the difficulties that lawyers have both in communicating DNA evidence to fact finders and their difficulties in communicating with expert witnesses. The most common themes that are discussed in this chapter include the use of forensic reports, explaining DNA evidence in court, the language and terminology used by those communicating DNA evidence and the notion of lawyers 'asking the right questions' and the ramifications of their failure to do so.

[130] Interview with L19 (26 July 2011).

6.5.1 Forensic reports

The communication of DNA evidence to lawyers, to fact finders and the court generally occurs in the form of a written forensic report. This is prepared by forensic biologists in the laboratory where the testing and analysis has taken place and is often given to lawyers in a truncated and summarised form.[131] Lawyers participating in the study expressed difficulty with forensic reports for two main reasons — the language and expression used and the level of detail in the information provided.

Language and expression

> They use a different language, if you don't understand the language and you don't understand what you're looking for its meaningless.[132]

Lawyers' difficulties with the scientific expression of DNA results is explored in detail at 6.2 above.[133]

The language used by forensic biologists in their written reports received mixed reviews from the lawyers interviewed. There have been concerted attempts to simplify the scientific language used so that the results of DNA tests are delivered in the most comprehensible manner possible.[134] Lawyers gave different reasons for the difficulties they experience with the language and expression used in forensic reports. One lawyer said that the last DNA report he had seen contained over 10 pages of dense scientific material. This had the effect of both lawyers and jurors having their 'eyes glaze over one tenth of the way into the report.'[135] Other lawyers said that the reports have improved in their use of plain English and because they now include an Appendix, which further explains their findings and the terms used.[136] Nevertheless, as noted above at 6.2, there are many lawyers who struggle with the presentation of the probability ratio, in terms of both the use of large numbers and the language used to present the results.

[131] Focus group with FS1–FS4 (4 June 2011).
[132] Interview with L14 (28 July 2011).
[133] See p 145.
[134] Focus group with FS15–FS20 (25 October 2011).
[135] Interview with L15 (7 September 2011).
[136] Interview with L23 (8 September 2011).

Level of detail

To make the reports easier to understand many laboratories have reduced their level of detail, simplified the language used and summarise their findings for ease of use by lawyers and the courts.[137] While this has made it easier to find the final probability ratio for that report, it has meant that lawyers still have little information available to them on the procedures and analysis techniques utilised and the limitations of the results themselves. One lawyer compared DNA forensic reports with those used in civil trials and argued that if reports like the forensic biology DNA results were used in civil trials 'judges would laugh at them because they don't have any of the findings and all the background work. It just says "a hit was made" and that's the probability.'[138] The data from the present study show apparently contradictory responses from lawyers to forensic DNA reports, with some lawyers having trouble with the length and detail of the reports, and others criticising the lack of detail and information in them. There was no single accepted view of the desirable level of detail and language that should be used by forensic scientists in their reports.

The lack of detail in the reports — or the absence of detail that would enable a lawyer to discern possible contamination issues, is best illustrated by the comment of a prosecutor:

> The reports are useful enough for the purpose of presenting the evidence in court and there's not much more than that. But what I'm suggesting is what's behind the report is not transparent — it's just not there. How can I possibly spot contamination if it's present then?[139]

The opinions expressed by lawyers in the present study concerning their difficulty in understanding the language, expression and presentation of information in forensic reports accords with the research of Howes et al.[140] These researchers recommended that information contained in forensic reports be simplified to make it more comprehensible to end users of the reports, namely the courts.[141] This recommendation draws on principles of content and sequence and on language principles.[142] Adoption of this recommendation would go some way to ameliorating the concerns of lawyers presented in this thesis. In recognition of this problem Victoria Police have considered the

[137] Interview with L17, (27 July 2011); Focus group with FS15–FS20 (25 October 2011).

[138] Interview with L5 (26 October 2011).

[139] Interview with L34 (6 September 2011).

[140] Loene M Howes et al, 'The Readability of Expert Reports for Non-Scientist Report Users: Reports of DNA Analysis' (2014) 237 *Forensic Science International* 7.

[141] Ibid.

[142] Ibid. Content, sequence and language principles refer to how written work is presented — specifically in this research, how forensic reports are written.

Victorian Supreme Court Practice Direction on the presentation of expert evidence[143] and, as requested by the courts, have recently produced standardised reporting practices across all disciplines.[144]

Alternative methods of presenting DNA evidence have been discussed by Goodman-Delahunty, Hewson[145] and Freckleton and Selby.[146] Their work, and the confusion generated by written forensic reports revealed by the present study, suggest that investigation is warranted into a more regular use of non-verbal communication of this information. Non-verbal means of communication including audio and visual PowerPoint presentations were recommended by Goodman-Delahunty and Hewson[147] and by the courts in the cases of *Pantoja*[148] and *Green*.[149]

6.5.2 Explaining DNA evidence in court

The role of the forensic scientist as seen by lawyers, judges and forensic scientists themselves can be explored through several key themes — cooperation, communication, preparation and education. Enhanced communication and cooperation between forensic scientists and members of the criminal justice system was acknowledged by many interviewees to be extremely important. For example, it can prevent the kind of problems alluded to by Judge P3 in the following quotation:

> I think [the issue] was poor presentation by the forensic scientist, but the prosecution lawyer clearly hadn't discussed it with him and didn't have a clue about how to resurrect the error that the defence lawyer had created.[150]

This statement, though brief, identifies a number of shortcomings in what occurred in the case in question, which can all be attributed to a lack of communication between prosecution counsel and the expert witness. As a result of this failure to communicate, the prosecution adduced the evidence poorly and defence counsel exploited these inadequacies to create the appearance that the prosecution evidence was erroneous. Further, the prosecution was unable to rehabilitate the evidence

[143] Supreme Court of Victoria, *Expert Evidence in Criminal Trials* (Practice Note 2 of 2014) 1, 3–5.

[144] Bryan Found, 'Standardised Reporting: Improving the Transparency of Forensic Science' (Paper presented at Australian and New Zealand Forensic Science Symposium, Adelaide, 3 September 2014).

[145] Jane Goodman-Delahunty and Lindsay Hewson, 'Improving Jury Understanding and Use of Expert DNA Evidence' (2010) 37 *AIC Reports, Technical and Background Paper Series*, 1–68.

[146] Freckelton, Reddy and Selby, above n 11.

[147] Goodman-Delahunty and Hewson, above n 145, 1-68.

[148] *R v Pantoja* (1996) 120 A Crim R 543.

[149] *Green v The Queen* (1971) 126 CLR 28.

[150] Focus group with P3 (3 May 2011).

by correcting the assertions made by defence counsel. The result may have been that the fact finder was left with a misrepresented view of the evidence.

There is a divergence in views between forensic scientists and lawyers on the way that forensic scientists should give evidence. The possible implication of this for lawyers is the miscommunication of DNA evidence in certain trials. If scientists expect lawyers to ask questions and explore evidence in a scientifically informed and educated way, and lawyers have an expectation that scientists will present DNA evidence in legal language, the DNA evidence may never have the authority or explanation that it might otherwise deserve or require. Lawyers and forensic scientists expressed a degree of frustration with regard to their disparate expectations of each other. Their failure to reconcile these differences endangers the accurate presentation of the evidence and creates a risk that it will be misinterpreted and miscommunicated to the fact-finder. This problem might be mitigated with improved communication about the evidence pre-trial. Pre-trial communication between lawyers and forensic scientists might expose some of the tensions highlighted in this section and the role of both forensic scientist and lawyer might be better understood by the other party.

Lawyers believe that scientists should tailor their evidence to suit the justice system. This view is incompatible in some ways with the limitations inherent to the forensic science disciplines. Lawyers' perceptions are illustrated by L24, a prosecutor responsible for introducing forensic biology experts in court, who commented that forensic scientists will not 'concede, they will not go past what they believe to be scientific or the way they're supposed to give their evidence in a scientific manner.'[151] The same lawyer suggested that forensic scientists avoid speculation because they want to maintain 'rigidity ... in how they give their evidence.'[152] Accordingly, there is clearly a divergence of views about whether scientists should be less 'scientific', as L24 appears to argue.

Nevertheless, because forensic biologists are professional witnesses there is an expectation that regardless of the content, they should communicate complicated scientific evidence clearly and comprehensibly to lay people. One lawyer explained, by analogy, the necessity to achieve a balance between maintaining scientific integrity and clearly communicating DNA evidence:

> From my view if you're a biologist who just deals with DNA that's fine. You can be an expert just in DNA, but if you're a biologist [who is] a professional witness, half of the skill set you're required [to have] is the ability to explain your science to a lay person. It's kind of a difference between a

[151] Interview with L24 (24 June 2011).

[152] Ibid.

> biologist and a biology teacher and they really need more teacher skills [like] the ability to break it down and submit a form and analogy and those sorts of things.[153]

This divergence in expectations about the 'performance' of the forensic scientists may indicate lack of cooperation, communication and understanding by both lawyers and forensic scientists about the role of the expert witness in relation to DNA evidence. Judges like P3, quoted above, acknowledge this tension. Lawyers' frustration about forensic scientists' reluctance to 'tailor' their evidence to a lay audience is a tension that may be overcome with improved pre-trial communication about the DNA evidence in particular cases. Blaming scientists does not help lawyers to fulfil their duty to make sure the evidence adduced can be understood by all in the courtroom. This cannot be done if they fail to communicate with forensic scientists or to obtain a level of understanding about the evidence that would enable them to see a way forward that preserves the integrity of the evidence and yet increases its comprehensibility.

Standard presentation

Many of the interviewees suggested that standard presentations for universally-accepted and non-contentious areas of DNA evidence should be introduced into criminal trials. This may assist in greater understanding not for only jurors, but also for lawyers and judges. Judicial participant P5, suggested that a chart be drawn up of accepted DNA evidence to avoid the situation where the jury is considering 'big numbers ... when it's not a real issue in the case.'[154]

In Victoria, L16 referred to a standard PowerPoint presentation used by forensic biologists at the Victoria Police forensic laboratory to explain their expert opinions in court and introductory films were also referenced by interviewees.[155] Both these measures were particularly useful for presenting non-contentious DNA evidence in criminal trials.

Simplifying complex evidence

Lawyers and expert witnesses, when dealing with DNA evidence, are faced with the unenviable task of simplifying very complex, scientific evidence for lay people. Essentially, what is required is for the evidence to be comprehensible, which means that scientists must be able to communicate information about DNA evidence in a 'way which enables them to be questioned about it and for the observers to understand their answers and again process what those answers mean.'[156]

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[153] Interview with L29 (22 June 2011).

[154] Focus group with P5 (3 May 2011).

[155] Interview with L16 (7 September 2011).

[156] Interview with L12 (8 September 2011).

It is, of course, not an easy task to present complex scientific evidence in a form that is comprehensible to lay people. One of the interviewees, L34, referred to a medical practitioner who gives evidence in Victorian courts as being an example of someone who can do this, but noted that there is no comparable DNA expert:

> [he is able to] explain to a jury in the simplest of terms that this is, what it's about ... He can translate his medical concept of the cause of death or the injury or whatever into simple terms that the jury can understand. I'm yet to find anyone giving evidence of DNA that's got the capacity to do that.[157]

Words like 'match', 'consistent with' and 'more probable than' are interpreted very differently by different people. Judges acknowledge the research in this area:

> P4: Especially when there are studies as well aren't there, on the interpretation of words. You can say to someone, what's stronger, highly probable or consistent with, and they'll interpret it completing differently. They might say consistent with is much stronger than highly probable when, in fact, ...
>
> P3: It's the other way around.[158]

The word 'possible' is not one favoured by most lawyers, particularly prosecutors who feel that the use of the word 'possible' means that defence lawyers can 'make hay [with DNA evidence] while the sun shines.'[159]

Lawyers participating in the study commonly referred to forensic scientists using 'jargon', but some lawyers and judges acknowledged that the evidence given by forensic biologists about DNA can never really be jargon free because there are words and expressions that come from within the discipline. This also applies to the jargon used by lawyers that forensic scientists say they find difficult to understand.[160] Many lawyers used words like 'gibberish'[161] and 'gobbledy-gook'[162] to describe the language of experts presenting DNA evidence. L5 agreed that lawyers need to know about the processes used and concepts involved in DNA testing and the results but found that when he challenged experts for the prosecution they reverted to using more complicated terminology and this

[157] Interview with L34 (6 September 2011).
[158] Focus group with FS1–FS5 (3 May 2011).
[159] Interview with L24 (24 June 2011).
[160] Focus group with FS5–FS10 (25 October 2011).
[161] Interview with L34 (6 September 2011).
[162] Interview with L30 (20 June 2011) in referring to speaking with a 'defence expert'.

was difficult to follow.[163] Time is then spent trying to understand what is said, rather than seeking to address issues with the evidence itself.

The importance of language and the ramifications of using words was explored in Martire et al's research[164] which focused on the use of verbal descriptors of strength as compared with numerically presented probability ratios. This research supports the proposition that people interpret the same words, for example 'match' in very different ways, assigning it varying degrees of strength. In contrast, in *Aytugrul v the Queen*[165] the High Court failed to acknowledge the significance '… research like that of Martire et al[166] by finding that the jury was likely to 'contain at least one juror capable of realising, and demonstrating to the other jurors, that the frequency estimate [used in the case] was the same as the exclusion percentage.'[167] This assumption, given Goodman-Delahunty and Hewson's work[168] in this area, is dangerous with respect to the communication of DNA evidence in serious criminal trials.

A good forensic expert must be able to communicate and explain DNA evidence in simple terms without losing scientific authority. Some lawyers believe that scientists should not use jargon and that 'they've got to simplify it, but give a proper explanation without all the ... caveats.'[169] However, scientists may fear losing accuracy if they abandon scientific terminology, in the same way that lawyers may fear losing legal authority if they abandon legal language in liaising with scientists. It is unrealistic to expect scientists to present their evidence without using any of the scientific language of their discipline. Equally, they are unlikely to desist from applying caveats to their evidence; their concern is to convey an accurate indication of its strength and correct interpretation. Nevertheless, a form of expression needs to be devised to maintain the integrity of the evidence and yet achieve its effective communication in court. The dilemma was expressed by L34 as follows:

> Well our job [is to be] more a communications expert than anything else, being able to convey [the evidence] to a jury in a way that the jury can understand. And to me that's the gulf that you have

[163] Interview with L5 (26 October 2011).

[164] See Martire et al, 'On the Interpretation of Likelihood Ratios in Forensic Science Evidence: Presentation Formats and the Weak Evidence Effect', above n 27; Martire et al, 'The Expression and Interpretation of Uncertain Forensic Science Evidence: Verbal Equivalence, Evidence Strength and the Weak Evidence Effect', above n 27; Martire, Kemp and Newell, above n 27.

[165] *Atygrul v The Queen* [2012] HCA 15.

[166] Martire et al, 'On the Interpretation of Likelihood Ratios in Forensic Science Evidence: Presentation Formats and the Weak Evidence Effect', above n 27; Martire et al, 'The Expression and Interpretation of Uncertain Forensic Science Evidence: Verbal Equivalence, Evidence Strength and the Weak Evidence Effect' above n 27; Martire, Kemp and Newell, above n 27.

[167] *Atygrul v The Queen* [2012] HCA 15, 75.

[168] Goodman-Delahunty and Hewson, above n 145, 1.

[169] Interview with L22 (20 June 2011).

> with DNA evidence and the communication of it. So, you've got this fear that you can't say anything that's not absolutely 100% right. So, you can't simplify it for the jury, but for the jury to understand it requires simplification.[170]

Goodman-Delahunty and Hewson's work suggests that jurors have limited knowledge of DNA evidence and that conviction rates are high among mock jurors with low levels of knowledge of DNA evidence.[171] If these convictions are based on an unjustifiable faith in, and lack of a sound understanding of, DNA evidence, it is clearly critical that lawyers and experts ensure that their expression of this complex evidence is simple and comprehensible. Wheate's 2010 research suggests that forensic experts cannot simplify their evidence to a point where it loses meaning, so a delicate balance must be struck between explaining DNA evidence adequately so that it has the requisite authority and ensuring jurors understand the evidence.

Communicating complex scientific evidence like DNA is not an impossible task. Although the profession needs to acknowledge that complex scientific evidence cannot be 'dumbed down', there is the possibility that it can be explained in more simple terms, perhaps using analogies as lawyers find these helpful or using visual aids like those found useful by L16. It is important that lawyers, judges and juries understand DNA evidence as presented by forensic experts both pre-trial and in court. Similarly, forensic experts must understand the legal framework in which they are communicating their evidence. Neither party should have to present 'over-simplified' evidence purely so that others may understand it. Rather, they should present evidence as their discipline requires, with lawyers then responsible, as L34 suggests, for being the 'communications expert[s]'.[172]

The implications for practice in this area are profound. The research suggests that when experts say one thing, lawyers and jurors may hear something entirely different. There needs to be a balance between communicating the appropriate terminology for the scientific and legal disciplines in criminal practice, and simplification of each discipline such that DNA evidence is understandable by lay people and non-scientists. If lawyers continue to expect scientists to change their language, and, in consequence, fail to communicate with them about what the terminology of DNA means, both science and justice professionals will lose an opportunity to maximise the ability of DNA evidence to assist in solving legal problems. Lawyers may use the wrong terms to describe the strength of probability ratios and jurors may interpret those words in an entirely different way to that intended by both scientists and lawyers.

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[170] Interview with L34 (6 September 2011).

[171] Goodman-Delahunty and Hewson, above n 145, 1.

[172] Interview with L34 (6 September 2011).

6.6 Conclusion

Lawyers have been dealing with DNA evidence in criminal cases for over two decades and yet, as the present research demonstrates, they still struggle with this evidence in several key areas. This chapter has answered the secondary research question of 'what do criminal lawyers find most difficult to understand about DNA evidence?' The predominant themes identified in the data have been discussed above, with illustrative quotations from the interview transcripts provided. Links between the themes identified in the data and the literature or case law in this area were established and the implications for criminal law practice were explained.

Lawyers have difficulty with the scientific principles associated with DNA evidence. The probability ratios and statistics being used in today's forensic biology laboratories are complicated and confusing for most lawyers working in the criminal law area. The mixed profiles that are now being found in traces left at crime scenes have proved to be problematic not only for criminal lawyers, but also for judges in both jurisdictions included in this research.

Procedural difficulties were divided between those occurring pre-trial and those encountered during the criminal trial. Pre-trial concerns were primarily about how to identify errors in DNA evidence and how to challenge the process used to generate the results in any given case. What contamination is and the importance of asking about contamination was well understood by lawyers, but they nevertheless experience problems in detecting possible cases of contamination from the information that is routinely provided. During trial, lawyers experience problems with how to examine and cross-examine experts meaningfully on DNA evidence. They have difficulty defining the nature of their and the forensic expert's role in presenting the evidence to the court. If it is indeed the forensic scientist who bears primary responsibility for ensuring that the evidence presented is comprehended and complete, this begs the question of what the role of the lawyer should be and how much do lawyers need to understand about the evidence.

The communication of DNA evidence is problematic, with lawyers critical of the information provided in forensic reports by biologists and confused about the role forensic experts and lawyers should each play in explaining DNA to the court. The language and terminology of DNA evidence and forensic experts in court was criticised by lawyers, with many having unclear expectations of what forensic scientists can and cannot say and the terminology they should and should not use. The theme of 'asking the right questions' was an important one for communicating DNA evidence to lay people during criminal trials. Forensic scientists interviewed were overwhelmingly of the view that lawyers are not asking the right questions of them and that the evidence is, therefore, not being given the correct weight in individual cases.

With an understanding of the practical realities of legal practice and the difficulties that lawyers face with the scientific, procedural and communication aspects of DNA evidence, it is possible to evaluate what DNA education programs might be most useful to lawyers and as well as being most likely to be utilised by them. The various methods available to lawyers to learn about DNA both formally and informally are discussed in the next chapter (Chapter 7).

7 Educating lawyers about DNA evidence

7.1 Introduction

This chapter explores how lawyers learn about DNA evidence. It is the key analysis chapter for the second research question which pertains to the opportunities and resources available to lawyers in this area. The focus is on identifying the various ways that lawyers have learned from others or taught themselves about the evidence. It presents the interviewees' views on whether the various methods of education currently available are considered 'useful' and which options they might use in the future. Lawyers' opinions of these measures are important because of their potential influence on their attendance at education programs and any improvement in their knowledge in this area. If the options available are not useful but continue to be offered, then lawyers may avoid engaging with DNA evidence education and their knowledge will not improve. Criticisms of lawyers in handling DNA evidence, as highlighted by the discussions of DNA evidence and its use in the courtroom in earlier chapters, warrants the investigation of the issues associated with further education for lawyers on DNA evidence.

Education and training program design is important. As early as 1982, education academics wrote about accommodating learning styles in designing education programs for professionals.[1] Dixon, a noted adult education expert, highlighted several factors that must be considered when designing educative programs for professionals. These include content, external constraints, the skill and preferences of the profession and the learning styles of participants.[2] This chapter focuses on the learning styles and preferences of lawyers, and to some extent judges, in relation to complex scientific evidence like DNA. There is research which indicates that programs that are designed with participant learning styles in mind are evaluated more highly by participants.[3] Accordingly, the present study investigates whether the education programs available to lawyers on DNA evidence are designed taking into account lawyers' learning styles.

This chapter looks firstly at formal DNA education programs in Victoria and the Australia Capital Territory (ACT) and then discusses several examples from overseas jurisdictions. The discussion next

1 Nancy Dixon, 'Incorporating Learning Style into Training Design' (1982) 36(7) *Training and Development Journal* 62.

2 Ibid.

3 H A Witkin, 'Field-Dependent and Field-Independent Cognitive Styles and Their Educational Implications' (1977) 47(1) *Review of Educational Research* 1.

moves to more informal measures of self-education including learning from scientists, learning from peers and undertaking personal reading and research with available materials online and in text.

7.2 Formal sources of DNA education

Lawyers were asked about the options available to them in accordance with research and interview question 1C.[4]

There are many formal DNA education programs and initiatives in Australia and overseas run by registered and certified education bodies, law societies, legal organisations and institutes and forensic science providers. They vary from one hour seminars and three or four day workshops to professional certification programs tailored to lawyers' availability. It is outside the ambit of this thesis to discuss all these initiatives. What this thesis does is introduce some of the available options for lawyers in Victoria and the ACT for education in this area. It also considers other courses and workshops in Australia and overseas for comparison and discussion purposes. They provide examples of the variety of information and courses available to Australian lawyers. Examples of programs organised by legal accreditation bodies — both face-to-face and online — are discussed, as well as those offered by private providers in Australia, the United States, Canada, the United Kingdom and Europe.

7.2.1 Law Institutes and Societies

In Australia, lawyers must attend continuing professional development (CPD) courses to retain their practising certificates as barristers and solicitors in their respective jurisdictions.[5] In the two primary research jurisdictions of Victoria and the ACT these courses are primarily, though not exclusively, run by the Law Institute of Victoria[6] and the ACT Law Society.[7]

Law Institute of Victoria

The Law Institute of Victoria conducts CPD courses on DNA evidence on an irregular basis. Following the 2009 release of the *Inquiry into the Circumstances that Led to the Conviction of Mr Farah*

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4 Research question 1C: What form of continuous legal education is available to criminal lawyers in Victoria and the ACT on the use of DNA evidence, and how does this compare nationally and internationally? See 4.4.1 above for discussion of this question.

5 *Legal Profession Continuing Professional Development (Solicitors) Rules 2015* (Vic) r 8; *Legal Profession Uniform Continuing Professional Development (Barristers) Rules 2015* (Vic) r 8; ACT Law Society, *CPD Guidelines: A Continuing Professional Development Scheme for Canberra's Legal Practitioners* (1 April 2015) ACT Law Society <https://www.actlawsociety.asn.au/documents/item/1124>.

6 For more information about the Law Institute of Victoria, see <http://www.liv.asn.au/>.

7 For more information about the Law Institute of the ACT, see <https://www.actlawsociety.asn.au/>.

Abdulkadir Jama[8] (Vincent Report), in 2010 the Institute hosted professional development initiatives on DNA evidence for practising criminal lawyers. These were on a once only basis, though they may repeat the courses in future. One of the first events of the 2010 program was a one-hour seminar presented by forensic scientist Jane Taupin, called 'Forensic Science Evidence in Criminal Trials.'[9] The aim of the seminar was to highlight some of the contentious issues that lawyers should explore in cases involving forensic science evidence. DNA evidence was the primary focus of the presentation. The seminar was available both in person and via teleconference and the author of this thesis was in attendance by distance. The material presented was introductory in nature, though it did cover some information on contamination and miscarriage of justice cases. Although the agenda promised further discussion of these areas, and of issues relating to the use of DNA evidence specifically, the allocated time expired before the presenter had the chance to discuss them. Lawyers in attendance received their CPD points, but did not gain the in-depth view of current issues with DNA evidence that they may have otherwise had if the seminar had been fully completed.

Just over one month later, the Institute held their Criminal Law Conference on the 30th of July where former Supreme Court Judge and author of the Vincent Report, Frank Vincent gave a presentation about his report and DNA evidence.[10] He presented the findings of the Vincent enquiry and the circumstances that led to Jama's conviction and later acquittal. There was a clear focus on how the DNA evidence was adduced in the *Jama* case and on the lack of challenge and communication by all those involved in the forensic and legal processes. No further courses on DNA evidence have been publicly advertised on the Institute's website since 2010, although they may have been conducted on a more ad hoc and informal basis since that time.[11]

ACT Law Society and Bar Association

The ACT Law Society is the body responsible for many CPD programs run for lawyers in the ACT. It has not held any DNA evidence-specific training programs in recent years. However, in July 2015 barrister

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8 Frank Vincent, *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (2010) Parliament of Victoria <http://www.parliament.vic.gov.au/papers/govpub/VPARL2006-10No301.pdf>.

9 Law Institute of Victoria, *Forensic Science Evidence in Criminal Trials* (2 June 2010) <http://www.liv.asn.au/whatsoncalendar?evpage=CPDDetail&function_code=CPD10S0206/CPD10S0206&eventid=CPD10S0206>.

10 Frank Vincent, *LIV Criminal Law Conference* (30 July 2010) Law Institute of Victoria <http://www.vicbar.com.au/GetFile.ashx?file=pdf/LIV_Criminal_Law_Conference.pdf>.

11 Many organisations hold in-house presentations that are not documented online, and that are open only to staff within those organisations. These might occur at the request of lawyers or scientists or may be conducted on a case-by-case basis as the need arises.

Hugh Selby delivered a CPD course on preparing and presenting expert witness evidence,[12] which targeted criminal lawyers who prepare and present forensic biology evidence, among other kinds of expert evidence in court.

The ACT Bar Association runs annual conferences on topics relevant to barristers in that jurisdiction. Former barrister Shane Gill delivered an information session on the use of statistics in DNA evidence at the CPD conference for the ACT Bar Association in 2011. During the 90-minute workshop, Gill, the 2014/15 President of the ACT Bar Association, addressed his concerns about the 'deceptive characteristics of the numbers typically used in prosecution evidence to give the evidence of potential match strength.'[13]

7.2.2 Private CPD course providers

Private organisations and educators in Australia and overseas provide education and training that may be relevant for Australian criminal lawyers. The discussion here does not provide an exhaustive list of the options available, but it does demonstrate the breadth of courses, seminars and workshops currently available to practising lawyers in the various countries and jurisdictions discussed. Many are available online.

One Australian private organisation that offers short courses on DNA evidence for lawyers is Forensic Foundations in Melbourne.[14] Many of these are certified by law institutes or societies for CPD points, and others are used by governmental organisations for their practising lawyers. The courses listed below are run as three-day workshops spread over three weekends that may be taken as an entire course or as individual units. The first day focuses on 'DNA Profiling: Theory and Practice.' This covers the more fundamental basics of DNA evidence — what it is, the information it can provide and the systems used for DNA evidence typing. The second day of the course gives a more hands-on experience of testing for DNA evidence (using participants own buccal swabs) and the amplification and information gathering processes. Lawyers are then invited to interpret and present their analysis with guidance from forensic practitioners. Day three is titled, 'DNA Profiling: Analysis and Interpretation' and focuses on the use of statistics and probabilities, Bayes theorem, the prosecutors

[12] Hugh Selby, *Preparing and Presenting Expert Witnesses* (22 July 2015) ACT Law Society <https://www.actlawsociety.asn.au/events/event/preparing-and-presenting-expert-witnesses>.

[13] Shane Gill, *The Use of Numbers in DNA Evidence* (June 2011) <http://shanegill.com.au/ethics-dna/>.

[14] See Anna Davey, *About Us* (2016) Forensic Foundations <http://www.forensicfoundations.com.au/who-we-are/about-us/>.

and defence lawyers' fallacy and the use of DNA databases.[15] The focus of all these courses is more on the scientific principles used in DNA evidence collection and analysis than on legal procedure.

Information on a 'DNA for Legal Practitioners' course offered by Forensic Foundations is presented in Table 1 below. This course is run by Anna Davey, Director of Forensic Foundations. The Table provides a snapshot from 2012–2014 of the clients who requested this course and of the attendance rates for different client groups on different dates. We see that on some occasions the course was well attended[16] as when the client was Victorian Legal Aid in July of 2012. On other occasions the course was run with the minimum number needed for it to go ahead and was offered by Forensic Foundations and advertised generally to the profession.[17]

Table 1 – Forensic Foundations 'DNA for Legal Practitioners' Course Summary 2012–2014

	Date	No of Attendees	Location	Client
1	March 2012	6	Melbourne	General
2	July 2012	20	Melbourne	Victorian Legal Aid
3	June 2013	5	Melbourne	General
4	Feb/March 2014	9	Sydney	General
5	Dec 2014	8	Sydney	Commonwealth DPP and NSW DPP

This Australian example is one of very few privately provided courses that offers training on the forensic sciences for those in the legal profession. Attendance rates for those courses run by organisations that employ lawyers, always had higher attendance than general sessions. This may have been due to greater advertising within those organisations or practitioners choosing not to utilise the course and the content.

DNA education is also offered by private providers in the United States who are certified to award CPD points to Australian practising criminal lawyers. One such course is the 'DNA Identification for Lawyers' course by Cybergenetics,[18] a company that runs DNA workshops using real life case examples and presentations on a wide range of DNA topics. Cybergenetics are the founders of the TrueAllele DNA testing system that is used by investigative organisations and laboratories around the world. Topics in the 'DNA Identification for Lawyers' self-paced training course include 'biology and information',

[15] Personal communication, Anna Davey, April 2015.

[16] Personal communication, Anna Davey, April 2015.

[17] The March 2012 and June 2013 courses fell into this category.

[18] Cybergenetics, *DNA Identification for Lawyers: CLE* (4 March 2011) <https://www.cybgen.com/information/courses/2010/DUCLE/Perlin_DNA_Identification_for_Lawyers_CLE/page.shtml>.

'mixture and interpretation' and 'True Allele Testimony'. The material is presented as a video, handout and PowerPoint that participants may keep.[19]

Private providers in the United Kingdom run CPD programs both on site at various locations around the United Kingdom and in legal firms and government organisations that request their services. Anglia DNA Services Ltd is one such provider and is accredited by the Solicitors Regulation Authority to offer a regular CPD course, 'The Use of DNA Testing in Legal Practice.'[20] The course covers the following modules:

- an introduction to DNA testing;
- an overview of the use of DNA testing for legal purposes;
- an explanation of paternity and family relationship (for example, sibling) testing in relation to legal practice;
- an understanding of the wording used in reports generated from DNA testing;
- an overview of some of the problems and limitations of DNA testing;
- an overview of the consent and ethical issues related to DNA testing;
- a guide to some of the current and most useful DNA information resources available to legal professionals; and
- a forum to ask questions and discuss related topics.

This course is run as a face to face offering rather than as an online, self-paced course.

In the United States, there is a large variety of online materials for DNA evidence education. A prominent provider of online courses on DNA evidence is the National Institute of Justice (NIJ), which is a registered training organisation that provides courses aimed at officers of the court. These are either run directly by the NIJ or by organisations deemed 'grantees' (including, for example, West Virginia University or RTI International).[21] The NIJ makes recorded webinars and seminars through partners like West Virginia University and RTI International.

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19 Ibid.

20 Anglia DNA Services Ltd, *The Use of DNA Testing in Legal Practice* <http://www.angliadna.co.uk/Continuing-Professional-Development>.

21 See RTI International, *About Us* (2016) <http://www.rti.org/page.cfm/About_RTI>.

Courses are fully delivered online and many are free to 'public safety employees'[22] and members of the public. Many of the courses are deemed to be 'on demand' and thus lawyers can utilise a self-paced learning model.[23] An example of these self-paced courses is 'DNA – A Prosecutor's Practice Notebook', with lessons that include the following:

- Investigating Cases Involving DNA;
- Preparing Cases Involving DNA;
- Presenting Cases Involving DNA;
- Special Case Circumstances; and
- Lab Report Analysis.[24]

Another is 'Principles of Forensic DNA for Officers of the Court'[25] with fifteen modules and lessons covering:

- The biology of DNA, including statistics and population genetics;
- DNA laboratories, quality assurance in testing, and understanding a laboratory report;
- Forensic databases;
- Victim issues;
- The presentation of DNA evidence at trial; and
- Post-conviction DNA cases.

This particular course involves a case study analysis of a rape and murder trial that focused heavily on DNA evidence.

Canadian organisations run self-paced and online education initiatives for lawyers on DNA evidence. For example, from 2010 the Canadian Police Knowledge Network has run an online course for police officers and other 'law enforcement officers' (which arguably includes lawyers) that is 3.5 hours in

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[22] For example, police officers and court officers, see National Institute of Justice, *Training: Courts and Courtroom* (16 April 2013) Office of Justice Programs <http://nij.gov/training/Pages/courts.aspx>.

[23] See discussion in Jackie Dobrovolny, 'How Adults Learn from Self-Paced, Technology-Based Corporate Training: New Focus for Learnings, New Focus for Designers' (2006) 27(2) *Distance Education* 155, 7.4.

[24] National Institute of Justice, *NIJ-Sponsored Course or Event: DNA – A Prosecutor's Practice Notebook*, Office of Justice Programs <http://nij.gov/training/pages/training-detail.aspx?itemid=71>.

[25] National Institute of Justice, *NIJ-Sponsored Course or Event: Principles of Forensic DNA for Officers of the Court*, Office of Justice Programs <http://nij.gov/training/pages/training-detail.aspx?itemid=70>.

duration and is coordinated by the Justice Institute of British Columbia.[26] Upon completion of the course participants should arguably be able to:

- Recall the basics of DNA science and its uses in law enforcement investigations;
- Identify biological substances and other unusual exhibits that may be used for DNA analysis;
- Recall DNA evidence collection issues;
- Recall the definition of 'accountable contamination';
- Recall the ways that DNA evidence results may be reported and interpreted;
- Recall the procedure for obtaining and executing a DNA warrant;
- Recall legal issues related to forensic DNA evidence; and
- Recall the federal DNA database legislation and how it affects forensic DNA evidence.

Canadian lawyers also have access to online resources in the United States, examples of which have been discussed above.[27] In addition to online courses, law conferences that focus exclusively on DNA evidence are advertised by the Nova Scotia Law Society. They are accessible both online and in person.[28] On 28 April 2012, the last of the thirteen Annual Canadian Symposiums on DNA Forensic Evidence was held in Toronto. It was run by the Osgoode Professional Development Centre through Osgoode University.[29] Topics included:

- The latest on the science of DNA;
- Understanding the difference between viral DNA and molecular DNA;
- Pitfalls and practical tips when presenting DNA evidence at trial;
- DNA data banking – current update, emerging issues and the future of the DNA data bank;
- The role of Interpol and international DNA data bank blunders;
- Impact of the National Research Council Report in Canada;

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[26] Justice Institute of BC, *Forensic DNA Evidence* (11 February 2010) Canadian Police Knowledge Network <http://www.cpkn.ca/course_dna>.

[27] Ibid.

[28] Ricardo G Federico and David S Rose, *12th Annual Canadian Symposium on DNA Forensic Evidence* (28 April 2012) Nova Scotia Barristers Society <http://nsbs.org/event/2013/01/12th-annual-canadian-symposium-dna-forensic-evidence>.

[29] Ibid.

- Legislative and case law updates in DNA search and seizure; and
- Admissibility of scientific evidence.

The Faculty of Law and Criminal Sciences at Lausanne at the University of Lausanne in Switzerland, alongside the Ecole Polytechnique Fédérale de Lausanne, offers a Certificate of Advanced Studies 'Statistics and Evaluation of Forensic Evidence.'[30] This course targets not only chief scientists but also other scientists involved in the testing and analysis of samples, the police and lawyers. It runs for 18 months and confers university credit on participants. The weekly, online commitment is approximately four hours with an additional four hours per week of personal work required outside the online platform. Shorter courses with a 150-hour commitment are also available on the 'Essentials of DNA Interpretation'; 'Essentials of Forensic Interpretation' and 'Essentials of Bayesian Networks in Forensic Science.'[31]

The Netherlands Forensic Institute (NFI) ran courses for lawyers, prosecutors and judges to help improve their ability to read and interpret the findings of forensic experts. One of these courses, which was available online, was titled 'Forensic DNA Analysis – Lawyers.' It is no longer available online.[32] This course concentrated on imparting scientific knowledge and had very little focus on the use of forensic evidence in a legal setting. It began with an introduction to forensic science and continued with sessions on quality assurance, 'ideal' forensic laboratories and expertise more generally.

Conferences run by universities and industry specific societies

Many conferences that are run by universities and industry specific societies are available to lawyers and forensic biologists. They may be eligible for CPD points for both professions. The Australian and New Zealand Forensic Science Society (ANZFSS)[33] runs bi-annual conferences in Australia and New Zealand and these can be attended by any interested lawyers[34] and forensic scientists. Such conferences would provide opportunities for communication to occur and informal relationships to

[30] European Network of Forensic Science Institutes, *Statistics and the Evaluation of Forensic Evidence Certificate of Advanced Studies (CAS)* (1 February 2014) <http://www.enfsi.eu/agenda/statistics-and-evaluation-forensic-evidence-certificate-advanced-studies-cas-online-course-18>.

[31] University of Lausanne, *Statistics and the Evaluation of Forensic Evidence – CAS* (March 2007) Formation Continue <http://www.formation-continue-unil-epfl.ch/statistics-evaluation-forensic-evidence-cas>.

[32] The Institute also ran two day 'Forensic Expertise – Lawyers' and two day 'Forensic Expertise – Prosecutors and Judges' courses as well as short course, 'Introduction to the value of Forensic Expertise in Criminal Justice Systems. None of these are currently available to lawyers online.

[33] See <www.anzfss.org> for further information.

[34] Like that of L36 who was a member of a state branch of this national body.

be developed between scientists and lawyers. The Expert Evidence Conference in Canberra[35] is another example of an industry-specific conference that gives lawyers the opportunity to interrogate and understand forensic biology evidence like DNA.

7.3 Lawyers experiences of CPD

The data reveal that interviewees had mixed experiences of formal DNA education programs they had undertaken. They were asked about these experiences in accordance with research and interview question 2C.[36] Interviewees' attendance rates were disparate and lawyers' attendance rates at education programs varied widely. Some had never attended formal DNA evidence training. L31, for example had 'never been to a single workshop or seminar in relation to DNA.'[37] L17 could not remember 'the last time DNA was covered' in his legal training or workplace.[38] Others had attended just one or two hour-long seminars in their careers.[39] In contrast, L14 said that he had attended so many workshop-style courses that he couldn't remember them all. His experiences were varied:

> we visited the McLeod forensic science centre in a conference situation. We attended lectures there with a scientist and viewed the lab and how they do it and the machinery used, the process. It was all very interesting but I didn't really understand it. I've been to numerous lectures put on by lawyers about the law in relation to it. I've been to numerous lectures put on by Victorian Forensic Science, other lectures put through the Victorian bar — the continuing legal education program — through other scientists independent of Victorian Forensic Science ... Heaps and heaps of lectures like that, they all seem a bit 'same same' after a while and in fact I've seen one lecture about three or four times.

L14 remembered having attended lectures 'put on by lawyers about the law in relation to it [DNA evidence] ... and lectures put on by the Victorian Bar.'[40] Similarly, L7 remembered attending hour long sessions organised by the Bar Association[41] and L28 noted that Legal Aid provide access to professional

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35 Last run in 2010 by the Australian National University College of Law. See <https://law.anu.edu.au/sites/all/files/conferences/files/expert-evidence/expertevidence.pdf> for presentation guide.

36 Research question 2C: What is the lawyer experience of education or training on DNA evidence? See 4.4.1 above.

37 L31 preferred talking to colleagues over formal sessions. Interview with L31 (28 September 2011).

38 Interview with L17 (27 July 2011).

39 Interview with L9 (7 September 2011); interview with L8 (7 September 2011) who also felt that it 'doesn't seem to be available.' Interview with L25: 'I have been to one session' (8 September 2011).

40 Interview with L14 (28 July 2011).

41 Interview with L7 (28 July 2011).

learning on DNA evidence.[42] As stated earlier, accredited courses are provided by organisations like Forensic Foundations in Victoria[43] and more informal sessions and lectures are run fairly regularly by forensic experts from State laboratories. These informal and ad hoc sessions are generally provided by private organisations and law societies upon request to government organisations or Chambers. L2 has attended sessions run by the Australian Federal Police[44] and L26 has asked experts from the Melbourne forensic laboratory at Macleod to coordinate regular sessions with lawyers as part of an ongoing education program.[45] Only one lawyer interviewed, L32, had personally attended a forensic science conference run by the ANZFSS.[46] He noted that the connections with forensic professionals forged as a result of attending this conference has proved to be invaluable in his work as a barrister:

> I know a lot of these people now, which is of course always useful when you're in an adversarial environment. If you've got a relationship with somebody they don't just see you as the enemy, they say, 'hang on, he's not a bad bloke and he understands his science a bit and that we're just doing our job.' Again that [means they're] less likely to want to bullshit because people don't want to be seen as potentially compromising their integrity to somebody who might be able to pick it up.[47]

L32 joined ANZFSS as a young lawyer and found the conference run by this organisation on forensic evidence to be invaluable, including the sessions on DNA evidence.[48] This is because of the connections he made there with the forensic science community, the communication that occurred between members of the legal and scientific professions and the familiarity he gained with terms and scientific procedures used by forensic biologists in testing and analysing DNA evidence.

The lectures, seminars, workshops and courses with modules or content published online that are discussed in this chapter all varied along a spectrum from purely scientific information and information on contentious issues or errors in forensic testing, to the use of DNA evidence in very specific legal contexts. L8 remembers a DNA evidence seminar that focused exclusively on the scientific principles of DNA testing and analysis, with no focus on the use of DNA evidence in legal settings.[49]

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42 Interview with L28 (8 September 2011).

43 See p 185-186 above.

44 Alongside Hugh Selby, barrister and author. Interview with L2 (21 June 2011). L24 (24 June 2011) has also attended AFP run sessions with forensic scientist Dr Simon Walsh.

45 Interview with L26 (8 September 2011).

46 See the Australian and New Zealand Forensic Science Society website at <www.anzfss.org>.

47 Interview with L32 (22 June 2011).

48 Ibid.

49 Interview with L8 (28 July 2011).

L3 similarly found that most of the DNA education programs he had undertaken had focused on scientific issues. He used the issue of cross-contamination as an example, noting that discussion of this matter had concentrated on how cross contamination occurred, and how one laboratory where it had occurred had improved its practice to ensure it did not happen in the future.[50] This is useful information for lawyers to know for the purposes of pursuing particular lines of enquiry in preparing for trial or eliciting information from witnesses. However, L3 stressed that little information had been provided about how lawyers might expose the fact that cross-contamination had occurred or might possibly have occurred.

L33 had had the opposite experience:

> most of the CLEs, certainly that I've seen in relation to DNA [focus on] the way in which it has arisen in court rather than [the science]. There have been a couple that have … given more about the scientific underpinnings of it.[51]

Twenty of the forty lawyers interviewed commented on the usefulness (or otherwise) of the various education programs on DNA evidence on offer. The consensus about formal education programs provided by way of seminars or lectures was that they were not particularly relevant to lawyers' daily criminal practice. For example, L35 said,

> [w]e had a DNA expert give a lecture here sometime late last year. … I wasn't too impressed with that one. I think it was too focused on the historical aspects of DNA like how it came about. Alec Jefferies and all of that jazz as opposed to actually how we can use DNA. I think we need something a bit more nitty-gritty where it's focused on how to interpret DNA profiles [in specific cases].[52]

L18 similarly complained about a mismatch between what lawyers hope to learn and what is actually covered in education programs provided:

> [The question lawyers have is] can I win my case? [T]his is the problem with these lectures. What you'll find is someone will turn up and say, 'we have these repeating base pairs' and then someone puts up their hand and says, 'I've got a case with a sperm sample and I want to know if I can get it excluded', and off you go. So, I think with lawyers you need to start with that.[53]

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50 Interview with L3 (6 September 2011).

51 Interview with L33 (25 July 2011).

52 Interview with L35 (28 July 2011).

53 Interview with L18 (26 October 2011).

L29 felt that offering DNA evidence education at set times throughout the year had the effect of reducing its practical relevance: 'I go to a seminar and listen to it ... absorb 50% and not apply it for a year and then forget it.'[54]

L3 simply described organised DNA education as 'not useful' and a 'waste of time' because the systems being used by the laboratories change over time.[55] The reason why L30 felt that formal DNA education was not useful was because learning is by doing for him as a lawyer,[56] but for L8 it was also because of a lack of time: 'I mean lawyers are busy, as you know, and I don't think there'd be much uptake for a day long or two-day workshop, seminar, or whatever.'[57]

Some interviewees found formal seminars, workshops and courses 'very useful',[58] and L20 felt they could 'get a lot from them'.[59] For example, L35 left his course with 'PowerPoint presentations that I kept with me for quite a while.'[60]

Although lawyers like L23 felt that formal DNA education was not particularly useful, they acknowledged that learning comes from a variety of sources, and that many people learn in different ways:

> I learn more when I'm under pressure for a particular case and I need to learn about it and I've got direct face-to-face interaction with my expert. I'm going to get a lot more out of that than I would at a seminar. But in some ways, I have to accept that's a personal thing. I wouldn't criticise seminars ... [and] I wouldn't dismiss that as a valuable source. Just from my point of view it's not the most valuable and I'm more likely to learn on a case-by-case basis. But I suppose it begs the question that we've had mistakes with DNA in the past and obviously there needs to be a system in place where people don't misunderstand DNA evidence. Now how did that misunderstanding arise — maybe that misunderstanding wouldn't have arisen had there been more education. So, I wouldn't dismiss education.[61]

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54 Interview with L23 (8 September 2011).

55 Interview with L3 (6 September 2011). L29 felt that 'formal seminars on DNA evidence suffer the same problems they suffer in the courtrooms; it's still scientists talking science', interview with L29 (22 June 2011).

56 Interview with L30 (22 June 2011).

57 Interview with L8 (28 July 2011).

58 Interview with L19 (26 July 2011). L28 found them useful when used in combination with other learning tools (28 July 2011); interview with L20 (25 July 2011); interview with L19 (26 July 2011); interview with L16 (7 September 2011).

59 Interview with L20 (25 July 2011).

60 Interview with L35 (28 July 2011).

61 Interview with L23 (8 September 2011).

Although the formal reports on the use of DNA and forensic evidence[62] recommend that more education on DNA evidence be provided for lawyers, it is important that there is a combination of approaches available to suit various learning styles. Most lawyers who commented on formal DNA education workshops and seminars did not find them useful, but many[63] saw that they had a place in assisting lawyers to become more knowledgeable and competent with DNA evidence in some way. This feedback may go some way to explaining why more lawyers do not engage with formalised programs and why there remains a knowledge gap in this area.

A great many interviewees saw a high value in more informal measures for improving their knowledge of DNA evidence and how to apply it in their criminal trials. The data indicate that lawyers learn about DNA evidence from a variety of sources, including talking to other professionals, from texts, articles and books and online resources available worldwide.

7.3.1 Talking to other professionals

The use of DNA evidence in criminal trials necessarily requires some manner of cooperation and communication between the forensic science and legal professions. For some interviewees,[64] the forensic biologists analysing and interpreting DNA evidence in their cases were their primary source of information about questions on DNA evidence. One of the judges taking part in the focus groups went so far as to say that 'everything I know about it; I've learnt from listening to [expert] witnesses.'[65]

One of the benefits of learning informally from forensic biologists is the accessibility this gives to information at the point in time when lawyers have a case involving DNA evidence. It is important to note here, however, that this proposition tends to only apply to prosecutors.[66]

Better communication between lawyers and experts was recommended by the Vincent Report as a possible solution to the problems that arose in *Jama*[67] such an approach can lead to informal education about DNA evidence. Because he views 'professional development courses as being

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62 See Chapter 2 on justifications for the research.

63 See, for example, interview with L28 (28 July 2011); interview with L12 (8 September 2011); interview with L17 (27 July 2011); interview with L22 (20 June 2011).

64 See interview with L38 (7 September 2011); focus group with P4 (3 May 2011); focus group with P1 (3 May 2011).

65 Focus group with P4 (3 May 2011). Also see interview with L38 (7 September 2011): 'it's mostly the experts.'

66 See 5.7 at 131 for a discussion of how your 'side' counts.

67 Where each of the professionals involved in collecting, testing, analysing and then forming a criminal case around the evidence did not communicate and operated in silos, see Frank Vincent, above n 8.

something too hit and miss',[68] judge P1 falls back on the interaction between experts and lawyers as an ideal education tool.

One prosecutor stated that if prosecutors are given a criminal brief that involves DNA evidence, they often just 'get the ... experts from FSL in and go through it and get them to teach [them] for that case.'[69] This accessibility leads to more open communication about the most relevant aspects of DNA evidence to particular cases and allows further conversation about what is and is not contentious about the evidence. Many lawyers ask that scientists begin their explanations from first scientific principles each time and apply them to each case specifically.

> Your ability to listen and accept that you don't know anything is really beneficial. And part of what I've found in my experience of law and having to quite often understand areas that I've never had any experience with is [the benefit of] actually sitting with the person and going 'take me through, like lead me by the hands through the woods and point out the trees as we go.'[70]

However as detailed in chapters 5[71] and 6,[72] defence counsel feel that experts are not as accessible to them as they are to 'State' lawyers.[73] One of the defence lawyers interviewed for this study (L12) said that while he learns a lot from scientific experts he does not feel that there is a 'culture of accessibility and openness prominent at the forensic science laboratory' to promote and further his education from this source.[74]

Although this same lawyer finds it generally useful, in learning about most areas of expert evidence, to build a strong and positive rapport with experts who regularly present evidence in court, this is not as often the case where DNA evidence is concerned:

> What I find really useful is in areas where we use experts all the time, for instance psychiatrists or psychologists. Once you've established a rapport with [that] expert over time, you can just call that person and informally speak to them and get a lot of useful information. But you're unlikely to use DNA experts often enough that you would build up that rapport.[75]

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68 Focus group with P1 (3 May 2011).

69 Interview with L15 (7 September 2011).

70 Interview with L27 (21 June 2011).

71 See 5.7: does your side count at 131 above.

72 See 6.3.2: investigating and challenging DNA evidence pre-trial at 158.

73 See 5.7: does your side count at 131 above.

74 Interview with L12 (8 September 2011).

75 Ibid.

Learning from forensic biologists who will be expert witnesses in court, not only allows lawyers to become better educated about the issues involved in specific cases, but also allows prosecutors to prepare for examination in chief:

> your preparation would be to talk to your expert first. Talk to your expert and find out where this all travels to, so that you can spend some time thinking about the questions you might need to ask so that your expert can let everyone know [in court] what we don't know and the[y] do know.[76]

Forensic scientists felt that they could be better utilised if lawyers understood the limitations of their knowledge and were better educated about their evidence and what questions to ask of them in court.

> What I think would benefit both sides would be an understanding of what's allowed and not allowed [to be asked of experts], what our boundaries are as expert witnesses and also what their boundaries are as lawyers.[77]

Learning from forensic biologists requires skilled communication,[78] though as L24 noted, 'as far as science is concerned it's a two-way street ... we have got to learn to communicate with them [and] they've also got to learn to communicate with us.'[79] This two-way street is often difficult to navigate because, as L30 explained, 'lawyers ask legal questions and biologists give scientific answers'.[80] However, if lawyers learn from forensic biologists informally, the disjunction between what is asked by lawyers and answered by experts may be reduced.

The problem with relying on informal education from scientists is that the tensions identified in Chapter 5 — time, access and the adversarial system more broadly — all have an influence on the degree to which this source of knowledge can be relied upon. As the quote above from defence counsel, L12, demonstrates, there is not a culture of accessibility to forensic biologists by defence counsel. L15, a prosecutor, agreed with this proposition:

> in an ideal world you have the time to keep up with recent developments in DNA in an effective way and are able to talk to witnesses easily and as much as you like; to be able to re-brief you at every stage, you need that done. But those things are all available at a place like this. It's easy to

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76 Interview with L27 (21 June 2011).

77 Focus group with FS1 (4 June 2011).

78 As suggested by the National Research Council Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) National Academy of Sciences <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> ('NAS Report') and Vincent Report, above n 67.

79 Interview with L24 (24 June 2011).

80 As noted in an interview with L30 (22 June 2011).

> click your fingers [and] say, 'I want the witness here' and they'll come. For the defence it's not so easy for them to do that, they have to be more proactive and be prepared to go out and see them.[81]

As the discussion in this section has shown, many of the lawyers interviewed have found that talking to experts and learning from forensic biologists is the most useful form of education on DNA evidence. Issues of access aside, language difficulties and communication of the evidence both prior to and during trials can only be improved if conversations occur between scientific and legal professionals. However, the tensions created by working in an adversarial system identified in Chapter 5 and the unequal access that lawyers have to DNA experts make it inappropriate for this kind of informal education to be the *only* form of education lawyers receive on DNA evidence. Nevertheless, it clearly plays an important role in bridging the gap between lawyers and scientists in communicating DNA evidence.

Lawyers also learn informally about DNA evidence from their peers in the legal profession. One of the benefits that lawyers associated with learning in this way is the ability to communicate in similar terms, using a common language. L30 feels that you 'need to get lawyers to teach lawyers' in some capacity.[82] The use of legal language in describing how DNA evidence is presented and to be used in criminal trials progresses lawyers' understanding, as explained by L13:

> Ideally it would be another lawyer because you don't necessarily speak in the same language that [experts] do and you're not used to describing things in the way that they want you to describe things. You're unlikely to have any rapport with an expert in the field.[83]

Additionally, lawyers favour learning from peers because, as L14 explained, they feel more comfortable about 'asking stupid questions',[84] which enables them to learn more about DNA than they otherwise might. It has also meant, particularly for defence lawyers in government agencies and at the Bar, but also in some cases for prosecution lawyers, that accessibility issues with forensic biologists are ameliorated. Lawyers in the same organisation, or barristers in the same chambers, may provide more informal and conversational-style direction and advice on where to find information.[85] They may also help determine whether there are issues with the evidence that need to be explored further:

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81 Interview with L15 (7 September 2011).

82 Interview with L30 (22 June 2011).

83 Interview with L13 (27 July 2011).

84 Interview with L14 (28 July 2011).

85 Many of the participants found lawyers to be their first point of information — see Interview with L14 (28 July 2011): 'chats with friends in Chambers who have done similar cases'; interview with L29 (22 June 2011): 'you'll find small pockets of lawyers out there with enormous experience'; interview with L17 (27 July 2011): 'I would ask a barrister who I knew had some knowledge of it'; interview with L35 (28 July 2011): 'any sort of

> If I know that there's a senior lawyer at Legal Aid with this experience, I can just quickly just run a scenario by them and quickly get a response that, yes there's a problem, no there's not, maybe there is and if it's maybe or yes, they'll tell me what to do next.[86]

Assisting fellow lawyers in relation to DNA evidence is an approach that L18 adopts. She is known in her Chambers as a lawyer who has knowledge in this area:

> I've got a whole bunch of resources and people are always coming to see me and asking to borrow them because they want to educate themselves. [Y]ou'd expect that from a group of people who are good at what they do ... I do [know] my own cases and the[re are] people who ask me for help.[87]

It is not only the language used by, and accessibility of, lawyers that make them an appealing source of information for other lawyers, but also their understanding of the adversarial system. L4 points out that lawyers learn their craft as a 'guild' or in an 'apprenticeship' system, and thus learning about scientific evidence like DNA should be no different.[88] Moreover, fellow lawyers understand what kind of information is likely to be most useful to other lawyers who seek their help:

> [This lawyer] wasn't explaining it to us from a scientific approach. He was explaining it to us from the perspective of how you go about damaging this evidence to get your client acquitted. That was his approach and that's what lawyers are interested in. Lawyers are particularly interested in [the] manner in which you can complete the magnification or extraction process. They're interested in how this is going to help my case or hurt my case.[89]

As a source of knowledge, a lawyer with scientific training or education is viewed as even better than a lawyer with understanding of the adversarial system. In 1994, Wilson argued that there was an acute need for interdisciplinary postgraduate courses, which incorporate studies across several areas, including law and forensic science, science more generally, criminology and ethics.[90] There are a growing number of university courses that specifically combine these disciplines, including the

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DNA matters that come up that happen to be around me sort of happen to come my way. So I'm having to help colleagues in terms of understanding the basics, what it all means.'

86 Interview with L13 (27 July 2011).

87 There are others who are also in this position — see L26: 'I suppose my other role is like I said I'm sort of a — one of the things I do in terms of assisting our lawyers is like if they've got a question about a DNA statement, I'm a person that they can come to and if I can answer their question I'll say, I'll answer it. If they need more than me then I can say, 'this is the person I need to speak to.'

88 Interview with L4 (25 October 2011).

89 Interview with L29 (22 June 2011).

90 Paul Wilson, 'Lessons from the AntiPodes: Successes and Failures of Forensic Science' (1994) 67 *Forensic Science International* 79, 86.

University of Canberra,[91] the University of Tasmania,[92] Griffith University,[93] and the University of New England[94] and it is possible for students to study individual units from these different disciplines and incorporate them into their degrees.

Seven of the lawyers interviewed for this research had undergraduate science degrees in addition to their law degrees and one had a Bachelor of Forensic Studies combined with a law degree. The qualifications of those lawyers with a scientific education included a Bachelor of Applied Science majoring in forensic biology (the only *forensic* science background),[95] Science graduates,[96] undergraduate Genetics,[97] an Associate Degree in Science (majoring in winemaking)[98] and research honours in Genetics after a combined Science and Law degree.[99] Although having a science degree was seen to be advantageous in some ways, because it is not the subject matter of day-to-day work for a lawyer, those with the such qualifications still find it necessary to refresh their knowledge of DNA science when working on cases involving DNA evidence.[100]

The sociological research of Albers[101] supports the proposition that fellow professionals — in this case, lawyers — have a role to play in educating others within their profession. Albers argues that so-called 'action learning' is consistent with three sociological notions:

1. That the whole is greater than the sum of the parts;

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91 The University of Canberra, for example, runs Bachelor of Forensic Studies/Bachelor of Laws degrees at the undergraduate level, see <http://www.canberra.edu.au/coursesandunits/course?course_cd=194JA>.

92 The University of Tasmania does not have undergraduate or postgraduate offerings in this area, but offers two forensic studies units: 'Forensic Investigation' <http://www.utas.edu.au/courses/art/units/hga213-forensic-investigation> at the undergraduate elective level and 'Foundations of Forensic Studies' at postgraduate level <http://www.utas.edu.au/courses/art/units/hsp503-foundations-of-forensic-studies>. The University of Tasmania subjects are not specifically for law students, although law students may take the undergraduate unit as an elective within their degree.

93 Griffith University offers a Bachelor of Forensic Science degree combined with a Bachelor of Criminology and Criminal Justice, see <https://degrees.griffith.edu.au/Program/1433>.

94 The University of New England offers the unit 'Fundamentals in Forensic Science' as a unit within the Criminology degree or combined Bachelor of Criminology/Bachelor of Laws course, see <https://my.une.edu.au/courses/units/FSC102>.

95 Interview with L21 (24 June 2011).

96 Interview with L3 (6 September 2011); interview with L30 (22 June 2011) — neither of these lawyers specified their majors. Interview with L32 (22 June 2011) who had a Bachelor of Science majoring in Chemistry.

97 Interview with L33 (25 July 2011).

98 Interview with L34 (6 September 2011).

99 Interview with L35 (28 July 2011).

100 Interview with L21 (24 June 2011).

101 Cheryl Albers, 'Improving Pedagogy through Action Learning and Scholarship of Teaching and Learning' (2008) 36 *Teaching Sociology* 79.

2. All social reality is human constructed;[102] and

3. Knowledge is therefore collaboratively constructed.

Together, Albers argues, these three ideas suggest that the work experience of groups of individuals in similar contexts is an untapped resource for improving practice. Peers in similar circumstances, and with similar levels of experience, act as resources for one another to develop strategies for change.[103] This supports earlier work on adult learning theory from key commentators in this area, Marquardt and Waddill.[104] Colleagues' experience results in valuable practical knowledge that helps guide personal practice — a practice that in law inherently involves unique events and where action involves judgment about what ought to be done in a particular case.[105] This accords with the views of the majority of lawyers interviewed who preferred these more informal methods of learning about DNA education.

Real life problems and situations provide fertile ground for genuine learning. The potential improvement of the work context also provides strong motivation for change. The focus is on actively effecting change by understanding the impact of behaviour on outcomes.[106] For lawyers, a program of education that involves DNA evidence may include the perspectives of others within the profession in order to enrich the reflective and overall learning process.[107] Again, and similarly to learning from scientists, this is not ideal as the *only* source of education about DNA evidence, particularly in the event that a lawyer's interpretation of DNA evidence for their own criminal cases is misguided. It is, therefore, important that this form of learning be combined with either self-education from other sources, as discussed here at 7.3 or the more formal education options considered at 7.2.

7.3.2 Reading and online research

Lawyers also utilise the academic resources of peer reviewed journal articles and reports, and non-peer reviewed resources that appear online both through Australian and overseas sources. The data, in fact, demonstrate that lawyers need to be able to refer to written resources to support informal communication they have with scientists and other lawyers. Significantly, such resources were

[102] Also see Peter Berger and Thomas Luckmann, *The Social Construction of Reality* (Anchor Books, 1966).

[103] Albers, above n 101.

[104] Michael Marquardt and Deborah Waddill, 'The Power of Learning in Action Learning: A Conceptual Analysis of How Five Schools of Adult Learning Theories are Incorporated Within the Practice of Action Research' (2004) 1(2) *Action Learning: Research and Practice* 185.

[105] John Olson, 'Making Sense of Teaching: Cognition vs Culture' (1988) 20(2) *Journal of Curriculum Studies* 167.

[106] Albers, above n 101, 81.

[107] Ibid 82.

deemed to be more important than formal courses. Lawyers consider this source of knowledge to be useful, particularly if it is in a format that is regularly updated and known to contain authoritative and accurate information.[108]

Texts

None of the lawyers interviewed could recall a particularly helpful textbook on DNA evidence, though L34 did say that lawyers will begin the process of reading about DNA evidence when they have a case that requires it. When that occurs, L34 argues that lawyers will 'rush out and buy the latest books on DNA and start reading them.'[109] A number of lawyers were of the view that a simple textbook on the subject at the level of 'DNA for dummies' would be particularly useful and potentially more useful than lectures or seminars on the topic. Both L9 and L7 refer to a book of this nature being ideal, with L7 saying, 'it would be far more useful than convening a lecturer and having 100 people sit there and listen to some scientist prattle on.'[110] They see these lectures — often based on specific cases and their use of DNA evidence — as being too hard to apply to other cases with different case information, whereas simple texts about the basic science are easy to refer to for introductory information.

L9 pointed out that 'there are books in the library on DNA, and they're thick and they're written by scientists. So, there is certainly room for a simple book on DNA.'[111] Other lawyers do not 'believe in reading books' because they express the views and training of the authors and not necessarily that of the entire profession.[112] The lawyers that participated in this research were not overwhelmed by the availability of textbooks that could assist them in understanding DNA evidence.

Articles

The data reveal that peer reviewed and more widely available non-peer reviewed research articles are of great utility to lawyers. Many research participants noted they read articles about DNA evidence.[113]

[108] Interview with L12 (8 September 2011).

[109] Interview with L34 (6 September 2011).

[110] Interview with L7 (28 July 2011).

[111] Interview with L9 (7 September 2011).

[112] Interview with L6 (7 September 2011). L15 has also stated that they would 'never have looked at a text book on DNA' (interview with L15, 7 September 2011) and preferred to go straight to the experts for information.

[113] Interview with L14 (28 July 2011); interview with L30 (20 June 2011); interview with L4 (25 October 2011); interview with L12 (8 September 2011); interview with L38 (7 September 2011); interview with L17 (27 July 2011); interview with L36 (20 June 2011); interview with L9 (7 September 2011); interview with L11 (24 June 2011).

Although there are numerous articles available online and in paper publication, the articles of most use to lawyers are those that explain the science and how it is applied in legal settings.

One of the articles identified as being particularly valuable by L11[114] is that of Edwards,[115] discussed in Chapter 2.[116] As noted there, Edwards gives a detailed checklist of issues for lawyers to consider when they work with DNA evidence to ensure it is free of contamination.[117] The article does not question the scientific validity of DNA testing, but instead discusses when and how past contamination has occurred. L11 was most appreciative of this article, noting:

> Reading and research is useful ... one article I [find] useful … [is] 'Ten things all lawyers should know about DNA evidence' ... I think it is true, going to that effort to read at least something that's pitched to one's intellectual level and background, like [that article]. Getting on top of that literature, is part of preparation too. So really, if you come across her convey my thanks, because it's pretty well known.[118]

Defence lawyer L30 found an article by an American public defender, Edward Ungvarsky, to be valuable. Again, the author writes from a legal rather than a scientific perspective. The non-peer reviewed article, 'What Does 1 in a Trillion Mean?'[119] explains, from a legal and procedural perspective, how statistics are used and how persuasive they can be in a courtroom.

Lawyers also regularly refer to material produced by Andrew Haesler, formerly a Senior Public Defender in New South Wales and now a Justice in the County Court of New South Wales. Haesler J has regularly published information on the use of DNA evidence in criminal trials on the Public Defender's website,[120] in journal articles[121] and at academic conferences.[122] Lawyers refer to his

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[114] Interview with L11 (24 June 2011).

[115] Kirsten Edwards, 'Ten Things Lawyers Should Know About DNA Evidence' (2005) 29 *Criminal Law Journal* 71.

[116] See 2.3.

[117] Edwards, above n 115.

[118] Interview with L11 (24 June 2011). Also see comments by L14 (28 July 2011): 'I get some case and I have to read up about it, there's a great article. … 10 things all lawyers [should know about DNA evidence].'

[119] Edward Ungvarsky, 'What Does 1 in a Trillion Mean?' (2007) 20(1) *GeneWatch* 10.

[120] See Andrew Haesler, *DNA for Defence Lawyers* (25 May 2011) NSW Public Defender's Office <http://www.publicdefenders.nsw.gov.au/Documents/dnafordefencelawyers.pdf>; Andrew Haesler, *DNA in the Local Court* (February 2009) NSW Public Defender's Office <http://www.publicdefenders.nsw.gov.au/Pages/public_defenders_research/Papers%20by%20Public%20Defenders/public_defenders_dna_local_court.aspx>; and Andrew Haesler, *DNA in the Local Court – the CSI Effect* (September 2010) NSW Public Defender's Office, <http://www.publicdefenders.nsw.gov.au/Pages/public_defenders_research/Papers%20by%20Public%20Defenders/public_defenders_dna_local_court_csi_effect.aspx>.

[121] Andrew Haesler, 'DNA in Court' (2008) 8(1) *Judicial Review* 121.

[122] See for example, Andrew Haesler, 'Issues in Gathering, Interpreting and Delivering DNA Evidence' (Paper presented at Expert Evidence Conference, Canberra, February 2011) <http://njca.com.au/wp-

articles because they are easy to understand and written in a way that they can apply directly to their cases with DNA evidence.[123] Haesler's publications on the NSW Public Defender's website are used by lawyers, including prosecutors like L2, from jurisdictions outside NSW.[124]

Flatman, a lawyer, writes about the probative value of DNA evidence and discusses some of the legal and scientific shortcomings and some of the current law on the acceptability of DNA as a form of scientific evidence in criminal trials in Australia. This is simply written and targeted to other lawyers looking to use and challenge this evidence.[125]

Some articles are written specifically for an educative function. For example, Moriarty and Saks wrote an article for American judges about the possible issues associated with using DNA evidence.[126] It begins by introducing the nature of the forensic sciences, which is of particular value in a time when there is more scientific information available than ever before. It then moves to the contemporary and historical fears about expert evidence and how the law attempts to resolve them. The analysis, of course, focuses on American case law rather than the Australian context; however, it does give judges a few options to observe if they wish to 'develop workable filters' to deploy in discharging their judicial gatekeeping role with regard to the use of DNA evidence specifically:

- Limited admissibility and disallowing conclusions of a match;
- Focusing on the task at hand — matching proposed expertise with the issue about which the expert is testifying in that specific case;
- Disallowing overpowering or misleading testimony;
- Proposal for use of court-appointed experts and panels of experts;
- Appointment and allowance of competing expert opinions.[127]

Benchbooks and other judicial officer-specific training

content/uploads/2013/07/Judge-Andrew-Haesler-SC-Issues-in-Gathering-Interpreting-and-Delivering-DNA-Evidence-paper.pdf>.

[123] Interview with L18 (26 October 2011); interview with L27 (21 June 2011); interview with L22 (20 June 2011); interview with L2 (21 June 2011); interview with L11 (24 June 2011).

[124] Interview with L2 (21 June 2011).

[125] Geoffrey Flatman, *DNA: A Trial Lawyers Perspective* <http://www.aic.gov.au/media_library/conferences/medicine/flatman.pdf>.

[126] Jane Campbell Moriarty and Michael J Saks, 'Forensic Science: Grand Goals, Tragic Flaws, and Judicial Gatekeeping' (2005) 44(5) *American Bar Association Judges Journal* 16.

[127] Ibid 29.

Australian judges undertake training in their role as judicial officers.[128] One of the judges interviewed for this research felt that Benchbooks are a useful source of information on DNA evidence.[129] The Judicial Commission of NSW has published material on its website about DNA evidence, including in the *Sexual Assault Trials Handbook.*[130] This discussion of DNA evidence in these sources focuses on the scientific aspects of DNA evidence concentrating on its significance as corroborative evidence and as evidence of identification. The Supreme and District Courts of Queensland Benchbook contains three pages on the definitions of DNA evidence and short discussions of the more relevant case law.[131] In 2006, Thomas referred to seminars and conferences run by the Judicial Commission of New South Wales on DNA for judges,[132] though there are no longer online records of these courses and judges (and lawyers) would not have access to them at this point in time. Benchbooks and handbooks are useful to both judges and practising lawyers. They inform judges about the fundamentals of DNA evidence, relevant case law and potentially contentious issues that might arise in relation to this evidence. They are useful to counsel in the same way that they are useful to judges, but, additionally, they alert counsel to the matters that may be in the forefront of judges' minds in relation to this evidence. This arms them with useful information about judicial thinking and, therefore, about what they might need to do to meet judicial expectations in adducing or challenging DNA evidence.

Online resources and reports

Both judges and lawyers acknowledge the variety and wealth of information about DNA evidence available online.[133] Victorian judges see the unedited internet as a powerful source of information and commentary about all areas of forensic science and utilise material produced particularly by the Americans in their own research on DNA evidence.[134] Lawyers also regularly consult the internet as a first port of call about DNA evidence: 'I'd Google it — there are a number of … forensic web sites.'[135]

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[128] See National Judicial College of Australia, *Judicial Education* <https://njca.com.au/>.

[129] Interview with P2 (3 May 2011).

[130] Judicial Commission of NSW, *Sexual Assault Trials Handbook* (August 2016) Judicial Commission of NSW, <http://www.judcom.nsw.gov.au/publications/benchbks/sexual_assault/index.html>.

[131] Queensland Courts, *Supreme and District Courts of Queensland Benchbook DNA* (May 2013) <http://www.courts.qld.gov.au/__data/assets/pdf_file/0007/86056/sd-bb-53-dna.pdf>.

[132] See Cheryl Thomas, *Review of Judicial Training and Education in Other Jurisdictions* (2006) Judicial Studies Board <https://www.ucl.ac.uk/laws/judicial-institute/files/Judicial_Training_and_Education_in_other_Jurisdictions.pdf>.

[133] Interview with L11 (24 June 2011); interview with L15 (7 September 2011); interview with L3 (6 September 2011); interview with L7 (28 July 2011); focus group with P5 (26 July 2011).

[134] Focus group with P5, P6 and P7 (26 July 2011).

[135] Interview with L7 (28 July 2011). See also, interview with L15 (7 September 2011): 'I probably would at some stage, it sounds bad but in preparation [I'd] see what's on the internet'; interview with L3 (6 September 2011): 'You know what you do nowadays — you'd go to the internet? I'd go Google, I'd go to Wikipedia right

In addition to a more general 'Google' search, lawyers also have access to online guides and resources. The no longer operating Forensic Science Service in the United Kingdom produced an online 'Guide to DNA for Lawyers and Investigating Officers' and the Crown Prosecution Service still provides this information on their website.[136] The Guide contains the basic scientific principles for a number of DNA testing procedures and flags issues of contamination, describes issues with databases and includes an important section on how best to evaluate DNA analysis. It also provides advice about further reading material and gives an appendix defining terms.

American Bar Associations and government justice agencies provide online resources that could potentially assist in educating Australian lawyers about DNA evidence. The American Bar Association published their most recent set of Criminal Justice Standards on DNA evidence in August 2006.[137] These standards pay particular attention to the scientific aspects of the evidence but also collate standards on the collection, preservation and use of DNA evidence; the testing of DNA evidence; pre-trial procedures including disclosure and defence testing and retesting of the evidence; considerations at trial; charging based on DNA profiles and finally DNA databases. Similarly, North Carolina produces a webpage that focuses on DNA analysis,[138] with links to other information about DNA evidence including reports, the American Bar Association Standards discussed above and other DNA-specific information. This page connects lawyers to a training manual for the defence Bar, written by the NIJ.[139] This publication was written by lawyers and forensic biologists. It begins by explaining the the science of, and testing techniques used, for DNA analysis, but then offers lawyers advice on the legal procedures associated with both adducing and challenging DNA evidence in cross-examination in

from the start and if you put in DNA into the Wikipedia it's going to … send you off scampering to the relevant text or scientific papers.'

[136] The Forensic Science Service (UK), *Guide to DNA for Lawyers and Investigating Officers* (2004) Crown Prosecution Service <https://www.cps.gov.uk/legal/assets/uploads/files/lawyers%27%20DNA%20guide%20KSWilliams%20190208%20%28i%29.pdf>.

[137] American Bar Association, *Standards On DNA Evidence* (2007) <http://www.americanbar.org/publications/criminal_justice_section_archive/crimjust_standards_dnaevidence.html>.

[138] North Carolina Office of Indigent Defense Services, *DNA Analysis* (2014) Forensic Resources, <http://www.ncids.com/forensic/dna/dna.shtml>.

[139] Eric H Holder, Jr, Mary Lou Leary and John H Laub, *DNA for the Defense Bar* (June 2012) National Institute of Justice <https://www.ncjrs.gov/pdffiles1/nij/237975.pdf>.

criminal trials.[140] This includes advice on questioning law enforcement officers on evidence collection[141] and effective cross-examination of DNA experts.[142]

An English resource that is openly available to lawyers around the world is the guide developed by Puch-Solis, Roberts, Pope and Aitkin.[143] This guide is intended for lawyers but still has a primary focus on the scientific aspects of DNA evidence, rather than the procedural aspects of how to investigate the collection and use of DNA evidence in criminal cases. The guide gives an overview of the following matters:

- DNA evidence and criminal proceedings;
- The DNA profile;
- DNA profiles as evidence in criminal proceedings;
- Assessing the probative value of single donor profiles;
- Two Person ('Mixed') Questioned Profiles;
- Low Template DNA (LTDNA); and
- Presenting DNA Evidence in Courtroom.

The publication suggests that there is an onus on trial counsel to maintain standards of clarity, to ensure that the evidence has indeed been presented accurately and clearly by forensic scientists for the benefit of the jury. The report supports a key finding of the present study that lawyers and judges are more capable of discharging their legal responsibilities — to the court, to society and to their clients — if they have a sound understanding of DNA evidence. The report also reinforces the importance of lawyers avoiding 'fallacious reasoning.'[144]

7.4 Conclusion

This chapter began by presenting an account of what education courses are currently offered to lawyers on an ad hoc basis by formal education providers. The discussion in this regard focused on Victorian and ACT offerings, but also gave examples of what is available elsewhere in Australia and

[140] Ibid 91–123.

[141] Ibid 110.

[142] Ibid 95.

[143] Roberto Puch-Solis et al, *Manual Assessing the Probative Value of DNA Evidence: Guidance for Judges, Lawyers, Forensic Scientists and Expert Witnesses* (2012) Working Group on Statistics and the Law, <http://www.maths.ed.ac.uk/~cgga/Guide-2-WEB.pdf>.

[144] Ibid 99 [7.18].

overseas. This discussion does not cover the field of what is available worldwide, but provides an example of what is currently being offered by various organisations and institutions in various jurisdictions. Lawyers have had a broad range of experience with these courses and their views have been presented in this chapter to help facilitate recommendations presented in Chapter 8 on DNA education. The chapter then provided an analysis of more informal measures of both self-education and outside organisational-led training. Lawyers seek information from forensic biologists who analyse and present DNA evidence and from their peers in legal practice. Both sources were identified by several interviewees. Many of the opportunities for informal education about DNA evidence for lawyers go beyond the ad hoc case-by-case interaction with experts and fellow lawyers. Reading and research conducted online in a self-paced environment constitutes a significant source of information and knowledge acquisition for lawyers. This chapter raises important questions about the utility of offering formal DNA evidence education through service providers. Lawyers argued that the availability of accessible and up to date information when they most need it is arguably more valuable. These findings inform the conclusions and two recommendations made in Chapter 8 below.

8 Conclusions and recommendations

8.1 Introduction

This thesis has presented research on two key areas — first, on lawyers' understanding of DNA evidence and the difficulties they face in dealing with this evidence in criminal trials, and second, on the training opportunities and resources available to lawyers in this area. This chapter concludes the thesis by first summarising the findings in relation to the primary and secondary research questions as they have been analysed and discussed in previous chapters. Based on those findings, it then makes recommendations for legal practice and policy changes and further research in this area.

8.2 Original contribution

This thesis makes an original contribution by exploring how lawyers manage DNA evidence in cases in which they act. In particular, it identifies influences upon the way that lawyers deal with DNA evidence in practice, including systemic factors integral to the adversarial criminal justice system. It discusses the difficulties they encounter with DNA evidence, their understanding of this evidence and their perceptions of their own role in relation to DNA evidence at trial. It also explores how they learn about DNA evidence in general and, more particularly, how they learn about how to contend with DNA evidence in a criminal trial context. The originality of this thesis also resides in the fact that the data analysed were obtained from those with the greatest experience and understanding of how lawyers manage DNA evidence, namely, lawyers themselves and the judges and forensic scientists with whom they work. This has enabled this thesis to provide original insights into the complexities of working with DNA evidence by drawing on the different perspectives of key actors in the legal system.

Chapter 2 identified the dearth of research on how lawyers deal with DNA evidence in practice. The reports - *Strengthening Forensic Science in the United States: A Path Forward* (NAS Report) and the *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (Vincent Report) [1] and previous research discussed at 2.2 indicate that lawyers play an influential role in jurors' perceptions of DNA evidence and suggest that how lawyers present DNA evidence has an impact on the outcome of trials. Most of the academic research outlined in Chapter 2 is consistent with the

[1] National Research Council Committee on Identifying the Needs of the Forensic Sciences Community, *Strengthening Forensic Science in the United States: A Path Forward* (2009) National Academy of Sciences <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> ('NAS Report'); Frank Vincent, *Inquiry into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama* (2010) Parliament of Victoria <http://www.parliament.vic.gov.au/papers/govpub/VPARL2006-10No301.pdf> ('Vincent Report').

recommendations of the NAS and Vincent reports in suggesting that a lack of competence in dealing with DNA evidence by all involved, has been a source of serious error in criminal cases. These reports have not reflected upon the possibility that there may be barriers to lawyers' acquisition of knowledge and communication with DNA experts, and that those barriers might be systemic and generated by the exigencies of lawyers' real life practice and/or the cultural norms of their work environment.

This thesis explores in depth the factors that may underpin lawyers' perceived lack of competence in this area. Building on existing research that recognises the problematic nature of DNA evidence for lawyers, it identifies and explores in detail the problems that lawyers experience in dealing with DNA evidence including, their difficulties in understanding elements of the scientific procedures used in testing DNA evidence, problems derived from the inability of DNA evidence to constitute conclusive evidence of guilt and problems relating to its presentation in court. Furthermore, by adopting a qualitative social scientific research methodology it explores these difficulties in greater depth than any previous studies. These matters are explored in Chapters 5 and 6 with a particular emphasis on uncovering the underlying sources of these problems and examining whether and how lawyers recognise and tackle them. It was found that while lawyers generally have an understanding of their own difficulties with this evidence and of the problems it generates, they are perplexed about how to overcome them.[2]

Because human involvement at all stages of the collection, analysis and presentation of DNA evidence introduces opportunities for mistakes to occur, effective oversight and scrutiny of investigative and analytical processes prior to the trial itself is of critical importance. Lawyers' views about these stages of the criminal justice process have not previously been sought. This study has identified some of the sources of frustration for lawyers in gathering information on DNA evidence, some of which may be remedied — for example, the lack of adequate information available to them about the collection and analysis of DNA evidence and, for defence lawyers, their lack of access to expert advice about DNA in the cases in which they act.

This study not only reveals the difficulties that lawyers experience in using, understanding and presenting DNA evidence in criminal trials, it also examines the source of those difficulties. For example, because the results of DNA profiling are never 100% certain they must be presented as probability ratios. Probability ratios, however, are problematic for lawyers. Both the work of other scholars[3] and the present study reveal that lawyers and jurors find them confusing and open to

[2] See 6.2–6.5 at 145-178.

[3] See 2.2.1–2.2.2 at 8–10.

misunderstanding and misinterpretation.[4] In common with previous research and reports, the conclusions from this study demonstrate that lawyers cannot counteract these problems unless they are adequately armed with relevant knowledge and skills. This study goes beyond earlier research and uncovers lawyers' perceptions of these difficulties in great detail.[5] The data show that lawyers themselves are aware of their need for adequate and effective knowledge. The problem for them is, how to gain it and, specifically, how to gain access to optimum sources of knowledge in a timely manner.[6] In this regard, one of the greatest challenges, as revealed by this thesis, is how to surmount systemic barriers arising from the adversarial process, which erect cultural hurdles to information sharing between the legal and forensic science communities.[7]

The Australian legal system and the adversarial nature of court trials and pre-trial procedure often dictates how much information lawyers are willing to share with opposing parties and, therefore, with experts. Importantly they influence whether defence counsel communicate with experts at all.[8] For prosecution lawyers, it appears that their perceptions of their own role in relation to DNA evidence may influence the degree to which they interact with DNA experts.[9] For the most part, tactical and cultural influences on lawyers' behaviour occur because lawyers work within an adversarial system in Australia,[10] a system that is unlikely to change in the foreseeable future. Any recommendations for change aimed at improving lawyers' knowledge of DNA evidence and their communication with DNA experts must, therefore, take systemic factors into account and acknowledge the influence of the Australian legal culture and the environment in which Australian lawyers operate on decisions they make about their work.

8.3 Research conclusions

This section explains how each of the research questions was answered by the data collected and analysis conducted in chapters 5, 6 and 7. The first of the primary research questions asked about

4 See 6.2.1 at 145-154.

5 In undertaking interviews with lawyers and judges and forensic scientists as professionals who work with lawyers in this area, the discussion and analysis of lawyers' perceptions of these difficulties is found in Chapter 6, specifically 6.2–6.5 at 145-178.

6 See analysis of the data in Chapter 5, exploring what the 'realities' of legal practice are for Australian criminal lawyers in this area. In particular, see also 6.5, the communicative difficulties lawyers face at 171.

7 See 5.7 at 131 about how your position as prosecutor or defence counsel has a role to play in your understanding and use of DNA evidence in criminal trials in Australia.

8 See 5.7.4 at 134.

9 See discussion of pre-trial procedure at 6.3.2 at 158 and the expectations of experts by lawyers at 6.4.2 at 168.

10 See 3.3 at 55 for discussion of the adversarial system as it operates in Australia.

lawyers' understandings of DNA evidence and the difficulties they have in dealing with this type of evidence in criminal trials.

8.4 Lawyers' understanding of DNA evidence

Lawyers' understanding of DNA evidence was dealt with in many sections of this thesis.[11] Despite the myriad of legal profession rules, guidelines and legislation governing criminal procedure for lawyers in Victoria and the ACT, overall this research found that it was not the rules in place but the adversarial nature of criminal trials that has the greatest impact on lawyers' behaviour. Understanding of DNA evidence was varied. Many described the mathematics and/or presentation of DNA evidence as 'gobbledy gook' or 'meaningless'.[12] Many expressed a lack of understanding about the science and mathematics. Many do have some understanding of some aspects of basic principles and procedure. They also understand where the problems in relation to DNA evidence can arise — flaws in its collection and analysis and problems arising from statistics and its limitations. However, they lack either an understanding of how to expose procedural flaws or the confidence to do so. Lawyers made the important point that while they know in theory how procedural errors might occur, they have difficulty in exposing their occurrence in practice. They also lack either the understanding and/or the skill to overcome misconceptions arising from the way that statistics are presented. Their ability to tackle these problems is not assisted by adversarialism because it erects barriers for defence lawyers to access forensic scientists working for State laboratories. Lawyers also typically lack access to requisite information (for example, the full biology file) that might alert them to procedural flaws. Further, restricted access to most relevant information and/or most relevant sources of information limits their ability to ensure presentation in court is accurate and comprehensible in lay terms and that there is not a mismatch between what forensic scientists say and what lawyers and jurors understand them to be saying.

Lawyers' conduct of cases must comply with relevant rules, guidelines and legislation. However, these rarely deal explicitly with DNA evidence,[13] and they are rarely directed at eliminating or reducing the likelihood of procedural errors.[14] Nevertheless, these general principles may be relevant to DNA

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[11] See for example, 5.3 at 112 and how lawyers identify contentious DNA and all of the analysis in Chapter 6 on difficulties with DNA evidence, particularly in identifying (or finding it difficult to identify) issues with the science, procedure or communication of DNA evidence in criminal trials.

[12] See interview with L34 (6 September 2011); interview with L30 (20 June 2011).

[13] See 3.6 at 76.

[14] One exception in this regard is that of the prosecutorial discretion in Victoria, see Director of Public Prosecutions Victoria, 'Director's Policy: Prosecutorial Discretion' (24 November 2014) Office of Public Prosecutions Victoria, 20 <http://www.opp.vic.gov.au/getattachment/5b830306-a17b-4ada-9078-6982539d44ac/2-The-Prosecutorial-Discretion.aspx>.

evidence and create a standard for knowledge about it and how lawyers manage it at trials. For example, expert evidence rules erect standards of authenticity and expertise in relation to DNA evidence and DNA experts. The rules also require lawyers to understand the knowledge area in which witnesses have expertise, so that they can ensure that witnesses do not offer opinions beyond their areas of expertise and so that the opinions they express are supported by the evidence and/or comply with the strictures of their discipline. The data analysed in this study suggest that lawyers do not always meet those standards. For example, it was found that some prosecution counsel abrogate their role in eliciting DNA evidence and instead rely on the experts[15] to give their evidence accurately and in accordance with evidentiary rules. Lawyers also have an obligation under the human rights standards for fair trials[16] to handle DNA evidence competently and to be knowledgeable about that evidence so that defendants are not unjustly convicted. Lawyers who make 'tactical' decisions to avoid talking to experts[17] or delay in sharing information[18] in a deliberate way may not meet their obligations under domestic and international human rights instruments or fundamental common law principles relating to fair trials. For example, the difficulties that lawyers have with statistics and probabilities[19] make it difficult for them to ensure that witnesses' meaning and jurors' understanding of statistics match.

There are shortcomings in the way lawyers deal with DNA evidence — observations of judges and forensic scientists make this point. However, this research has found that these shortcomings are not necessarily due to lack of diligence or competence, or even to lack of understanding simpliciter, although this does play a part. Additionally, lawyers' capacity to discharge their responsibilities in relation to fair trials[20] and DNA evidence are constrained by conventions of the adversarial process.

Where decisions are made not to pursue a greater understanding of DNA evidence or where adversarial conventions stand in the way of lawyers improving their knowledge of, and skills in, handling DNA evidence, their ability to discharge their domestic and international human rights obligations in relation to fair trials will necessarily be constrained. This suggests that what is needed

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15 See 6.3.2 for pre-trial procedure concerns and 6.5 regarding communication between prosecutors and experts.

16 See 3.4 at 57 for a discussion of the human rights framework relevant to this discussion.

17 As some defence counsel have said they do, see 5.7.4 at 133.

18 See 6.3.1 at 156 and 3.4.2 re international case law on delay and unfairness at 60.

19 See 6.2 at 145.

20 Under the Victorian and ACT human rights instruments and under the *ICCPR*, see 3.4.1 at 59.

is a greater appreciation of the negative impact of some adversarial conventions and tactics for the management of DNA evidence.

8.4.1 Limitations of DNA evidence

All lawyers interviewed understood the limitations of DNA evidence when directly asked about this in interviews[21] in accordance with research question 2A.[22] In Chapter 5, the data analysis indicates that contamination and transference during investigations and misinterpretation of the results by jurors at trial are all commonly known to limit the reliability of what is generally perceived to be a robust form of scientific evidence. This suggests that although lawyers rarely challenge DNA evidence, this is not necessarily because they don't understand that it has limitations, or how it may be used or relied on. Rather, other factors are at play like inadequate information, for example, about the collection and analysis of the evidence in the cases in which they act, which might enable them to mount challenges to it.

Nevertheless, because DNA evidence is common but rarely contentious, lawyers might assume that it is reliable when, in fact, it is deficient in some way. This amplifies the potential for oversights and errors in procedure to occur — *Jama* provides an example of a systematic failure by all parties involved to communicate with each other and go beyond the accepted reliability of DNA evidence to scrutinise its actual reliability. Despite the legal community's heightened awareness following *Jama* and the Vincent Report, the potential flaws in DNA evidence collection and analysis have not been — and cannot be — eliminated in any Australian jurisdiction because of the human element involved in those processes. Clearly, this mandates co-operative investigation of the evidence by all involved in cases in which it is offered as significant and/or potentially contentious evidence of identification and guilt. This means that in such cases lawyers should routinely be given the most detailed information possible about the chain of evidence as well as access to the biology file. Resources including written materials[23] to assist lawyers who do suspect an error in procedure are also needed, which should include unfettered access to information and experts rather than access determined by tactical considerations or a lawyer's 'side'.

Even though, in theory, DNA evidence is to be treated in the same way as other circumstantial evidence,[24] in practice, lawyers and jurors appear to value it more highly than other forms of

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21 See interview schedule at Appendix F.

22 See 4.4.1 at 84.

23 Like those referred to as 'useful' by lawyers in 7.3.2 at 201.

24 See discussion in 5.5 at 120-122.

circumstantial evidence.[25] This view is even supported by decisional law,[26] which accepts the proposition that a case may proceed to trial on DNA evidence alone.[27] Normally, circumstantial evidence operates in a cumulative way, so that one item of circumstantial evidence is rarely sufficient to establish guilt beyond reasonable doubt.[28] The apparently inflated value of DNA evidence needs to be acknowledged more openly in practice. We understand from what happened in *Jama* that if DNA is the only evidence of guilt, or one of a very few items of prosecution evidence, then lawyers must go beyond the forensic report and talk to experts to ensure that it is sound. Whether lawyers do this will depend on their own general perceptions of DNA evidence, their confidence in dealing with it and the extent to which they feel able to speak about it to experts. A number of lawyers who participated in this study expressed a lack of confidence in relation to these matters. This suggests that they need support in this regard, which might be provided in different forms, including through educational programs that foster a cultural shift in communication practices, and through easily accessible practice guidance. Lawyers' appreciation of Kirsten Edwards' 'Ten Things Lawyers Should Know About DNA Evidence' demonstrates how valuable practical guides in relation to DNA evidence can be.

8.4.2 Lawyers' effectiveness

The next secondary research question asked how lawyers can be more effective with DNA evidence in criminal cases. Lawyers' ability to deal effectively with DNA evidence is influenced by the adversarial system. Some defence lawyers avoid experts and, as far as is possible without breaking their professional obligations, adopt a 'trial by ambush' modus operandi.[29] Improving communication between State forensic scientists and defence lawyers while there is a State-funded forensic science system that primarily serves prosecution lawyers in an adversarial system may take significant time. Cultural shifts in an adversarial system can be difficult to achieve, but not impossible, particularly if lawyers themselves support them. A lawyer's 'side' as a prosecutor or defence lawyer influences how they use and understand DNA evidence[30] and how much of an impact the adversarial system has on

[25] See for example interview with L15 (7 September 2011) and interview with L22 (20 June 2011) who stated 'without the DNA we've got next to nothing, with the DNA we've got a good case.'

[26] *R v Forbes* (2009) 167 ACTR 1.

[27] See 5.5.4 at 126.

[28] A reasonable inference can be drawn from a combination of facts, none of which viewed alone would support that inference: see *Chamberlain v The Queen (No 2)* (1984) 153 CLR 521; *R v Sorby* [1986] VR 753; *Shepherd v The Queen* (1990) 170 CLR 573; *R v Hillier* (2007) 228 CLR 618; *R v Allen* [2007] VSCA 97.

[29] See 5.7.4 at 133.

[30] See 5.8.

their behaviour in practice because they may choose to conduct trials by ambush[31] or avoid sharing information.[32]

Lawyers will need to deal with new technologies as the science changes and develops and smaller amounts of trace evidence can be collected, analysed and interpreted. If lawyers are to challenge the scientific validity of DNA testing in some, if not all cases, then information and access to experts is important so lawyers feel competent and confident to gather information on these changes.

8.4.3 The process involved

Research question 4A sought to explore the process lawyers follow when they have a brief that includes DNA evidence. The answer is — 'it depends'. It depends on the individual case and whether the evidence was supported by other evidence and/or contested. Predominantly though, lawyers talk to other lawyers, do online research in academic journals to find articles that were relevant to their case, look for precedent on how courts have handled other cases using the same type of DNA evidence or with the same issues. It may not be deemed 'appropriate' to talk to experts if the forensic report is detailed and written in language that is well understood for those without scientific knowledge and if there is other supporting evidence for the case. If a case is serious, with very little supporting evidence, lawyers are more likely to talk to experts about the DNA evidence. However, it is not common for lawyers to communicate pre-trial with DNA experts. The results are that lawyers may be less well informed about the DNA evidence in cases in which they act than they might otherwise be.

8.4.4 Difficulties with DNA evidence

The second primary research question focused on the training opportunities and resources available to lawyers on DNA evidence and what lawyers' views are about the value of those opportunities and resources. Secondary research question 1B was, 'what do criminal lawyers find most difficult to understand about DNA evidence'?[33]

In Chapter 6, the analysis of the results reveals that most lawyers interviewed understand the procedural aspects of DNA collection and analysis and the chain of evidence — those areas where experience suggests that error is most likely to occur and to lead to miscarriages of justice. However, the data clearly reveal that a theoretical understanding of these matters is not sufficient to prevent miscarriages of justice. As already noted, a key difficulty is to apply that understanding in practice and expose any errors that do occur in that process. Without adequate information about the chain of

[31] See 5.7, particularly 5.7.4 at 134 on avoiding experts and trial by ambush in an adversarial system.

[32] See 5.5.3 at 125.

[33] See 4.4 for all research questions.

evidence and potential sources of contamination or transference, such errors will remain hidden. Other sources of difficulty for lawyers revealed by this study are the science of DNA evidence, probability ratios and mixed profiles. Some lawyers find the numbers used to express results confusing and intimidating. Identifying errors, comprehending scientific reports and uncovering contamination in practice are procedural difficulties both in the pre-trial and trial stages. There is a significant mismatch that can occur at trial between what scientists understand themselves to be saying and lawyers' and jurors' interpretation of what they say. This links particularly to one of the key findings repeatedly emphasised throughout this thesis about the critical importance of co-operative pre-trial communication between lawyers and forensic scientists — a point that was stressed by forensic scientists and discussed in judges' observations in the focus groups.[34]

Examining and cross examining experts using the appropriate scientific language is also difficult for lawyers, particularly given the lack of communication pre-trial and the lack of information provided by some forensic reports.[35] Additionally, there is some confusion about whose role it is to take responsibility for eliciting experts' evidence in court. Prosecution counsel may abrogate their responsibility to ask questions that elicit the evidence accurately, clearly and comprehensibly and leave it to the witness to give the evidence as they think best.

8.4.5 Legal education

Three of the secondary research questions were relevant to the investigation of legal education on DNA evidence for criminal lawyers. This section summarises the conclusions reached in relation to the questions: 'what form of continuous legal education is available to criminal lawyers in Victoria and the ACT on the use of DNA evidence, and how does this compare nationally and internationally (research question 1C)?; what is the lawyer experience of education or training on DNA evidence (research question 2C)? and where do criminal lawyers get information to help them with briefs containing DNA evidence in criminal trials? (research question 3C)?

Lawyers rarely undertake formal education on DNA evidence beyond the workshops or seminars hosted by their workplaces or by the Law Institutes in their jurisdiction. Education in such workshops tends to concentrate on the introductory scientific principles of DNA evidence, or in some cases, the particulars of cases deemed to be miscarriages of justice. Conferences that bring together forensic practitioners and lawyers, like the Australian and New Zealand Forensic Science Society's bi-annual conference, are useful not only for knowledge building, but also for building relationships and enabling

[34] See 6.4.1-6.4.2.

[35] See 6.5.1.

improved communication between criminal lawyers and experts. Lawyers find information about basic DNA principles useful to a degree, but their attendance at programs that focus on these matters is limited, particularly if they are scheduled to occur during already busy working hours.

Lawyers, particularly defence lawyers, seek information about DNA evidence on a case-by-case basis and predominantly when working on cases involving contentious or statistically significant results in relation to proof of guilt. If this is the case, they gather information from a variety of sources. They may rely on their own experience of using DNA evidence. Prosecutors may talk to forensic experts from the State forensic laboratories and, in very limited circumstances, defence lawyers may also approach forensic experts for guidance or clarification. However, generally defence lawyers do not consider it to be 'tactically appropriate' to talk to State forensic experts. Lawyers also learn about DNA evidence by talking to others in the profession who have had experience with the evidence in their own cases and they learn from reading information online, in text books and in case law. Lawyers also appear to find in-house instruction offered in some workplaces to be particularly useful. Such sessions can be tailored to the particular needs and areas of interest of the lawyers in those workplaces.

8.5 Recommendations for policy and practice

There are several categories of recommendations that flow from these findings. These acknowledge that lawyers have some understanding that DNA evidence can be problematic, that it has limitations and what the source of its problems may be, but they, nevertheless, have difficulty in making practical use of that information. These recommendations are divided into four categories. The first is recommendations based on the adversarial nature of trials, as this has proved to be one of the most influential aspects of the legal system on lawyers' behaviour in this area. The second is DNA education and the third focuses on improved communication of DNA evidence. The final category focuses on recommendations around pre-trial information about DNA evidence.

8.5.1 Recommendations: the adversarial nature of criminal trials

The adversarial nature of criminal trials has a marked influence on lawyers' behaviour when using DNA evidence and it informs several of the conclusions drawn in the preceding paragraphs. This thesis makes four recommendations to ameliorate the detrimental effect of lawyers using the adversarial system in a strategic way in cases with DNA evidence.

This thesis has presented some of the more negative effects of an adversarial system for lawyers using DNA evidence in criminal justice in Australia.[36] The first recommendation is that lawyers need a greater

[36] See 5.7.4 at p 134.

appreciation of the negative impact that adversarial conventions and tactics have on the management of DNA evidence. This thesis explains those conventions and tactics, in many cases using lawyers' own words. This thesis may then form a basis for government legal organisations and Chambers to begin a discussion with lawyers about how actual legal practice has strayed from the ideal, and, in doing so, bring those tactical considerations and conventions to the fore so that all lawyers are candid and honest about how they are using and managing the DNA evidence in trials. This may not only lead to a greater appreciation of the negative impact these tactics may have, but also influence lawyers' behaviour in a positive way that reduces their reliance on deleterious conventions and strategies.

This recommendation is linked to the second recommendation in this category, which relates to the perception that, in practice, DNA evidence is different to other circumstantial evidence.[37] This view should be acknowledged more openly by lawyers and by those in the legal and forensic science system. If it were more prevalent in discussions between criminal lawyers and their managers or senior barristers in Chambers, as well as in publications in this area, then lawyers might spend more time exploring expert credibility (see the third recommendation in this category below) and request more information from experts regardless of their 'side'.

The third recommendation is that lawyers should apply or, at the very least, consider how to apply the requirements of s 79 of the uniform *Evidence Acts* (admissibility of expert opinion and the exceptions to the opinion rule) with increased rigour in cases involving DNA evidence. In many cases, lawyers appear to accept without question the expertise of those giving evidence in forensic biology cases, and as cases like *Honeysett v The Queen*[38] demonstrate, such expertise should not be assumed in current legal practice. Each case is factually different and experts who testify regularly must also have their expertise measured against the evidence in those cases. This means, as *Honeysett* also demonstrates, that lawyers should carefully scrutinise and police expert evidence to ensure that it does not stray beyond the witnesses' precise area of expertise or into the province of the jury.

The final recommendation in this area is that the system needs to overcome the restrictive access currently encountered by defence lawyers to forensic laboratories. Whether the restrictions are real or perceived, tactical considerations in avoiding talking to experts must be overcome by opening access to forensic laboratories to all lawyers at all stages of the investigative process. This is a move required of forensic laboratories and certainly the State as managers of those laboratories. Rather than relying on defence lawyers to request access to information, the recommendation is that at the beginning of a case with potentially contentious DNA evidence (it is not likely that lawyers would have

[37] See 5.5 at p 120.

[38] [2014] HCA 29.

the time to do this in all cases involving DNA evidence), both defence and prosecution lawyers are invited to the laboratory and that they receive the same information and same level of access, if they require it, to the experts, to the forensic biology files and to the evidence.

Cultural shifts in this area are important to achieve change and improve knowledge and more competent use of DNA evidence by all lawyers. More open communication and acknowledgement of the adversarial nature of these trials and the tactics that arise thus may help in reducing deleterious behaviour, though it may not eliminate it completely. Nevertheless, an awareness of lawyers' common tactics in relation to DNA evidence and their approach to expert witnesses, as revealed in this thesis, creates the opportunity to move forward and create change.

8.5.2 Recommendations: DNA education

Interviewees made it very clear that they learn about DNA evidence on a case-by-case basis. That means that they seek information in a more ad-hoc manner than DNA education courses run at regular intervals on the basics of DNA evidence generally provide. They need information at short notice and often have questions or require clarification for very specific areas of the science (for example, about low copy DNA or how transfer might occur on certain materials). There are five recommendations that this thesis makes in this category and they each focus on the provision of information if and when lawyers need it and a more open access to a variety of learning sources. This thesis has explained the various ways in which lawyers learn about DNA evidence and those that they find most useful. Lawyers need a variety of information sources which suit their various learning styles and the variety of cases on which they will work. Unique cases will require lawyers to be able to access a hub of information from workshops, journal articles, advice from more experienced lawyers, and, most importantly, an environment where all lawyers can freely talk to experts without tactical considerations preventing them from doing so.

The first recommendation looks at the combination of pedagogies explored in the research in Chapter 7 and the insights from lawyers interviewed and presented in chapters 5 and 6 on how lawyers learn. This thesis recommends that a combined approach to DNA education for lawyers be supported and provided. The approach adopted needs to overcome the 'tactical' considerations that sometimes prevent lawyers from gathering the most pertinent, relevant and accurate information about DNA evidence. The primary consideration is that relevant information should always be available — suggesting a dominant role for online courses or online information portals that may contain contributions from Australian and, even, international specialist forensic biologists. This recommendation supports having the most up to date information available and it allows for leaders in the field of forensic biology to present the most accepted information for use in legal cases. Online

self-directed courses or information portals like those used in the United States[39] would also allow lawyers to gather information in their own time and when a case requires it. Because defence lawyers have also noted difficulty with, or tactical concerns around, accessing experts employed by the State, having access via email to noted professionals through an online portal may ameliorate that access problem and improve knowledge and accessibility to information needed to improve knowledge on a case-by-case basis. One of the key considerations behind this recommendation and the provision of any online resources or portals is that lawyers need to be able to re-familiarise themselves with information about DNA evidence. This is necessitated by the fact that they seek information on DNA evidence on a case-by-case basis. Practical training, workshops and seminars also have a place but their value appears to reside principally in the information that they can convey about lessons learned in previous cases or about the application of DNA evidence in a practical way in a legal context.

Because no single form of education on DNA evidence is deemed 'the best' and a variety of instructional modes should be fostered, having access to other lawyers who have worked with DNA evidence in major Australian cases in recent years is the second recommendation made in the area of DNA education. Facilitating group discussions where lawyers share their experiences of contentious DNA evidence and cases is important and might be organised by the Law Societies of Victoria and the ACT and advertised to all lawyers with current practising certificates. This may also help overcome the restrictive access currently encountered by defence lawyers to forensic laboratories and facilitate greater information sharing between lawyers, whether they are prosecutors or defence counsel.

The third recommendation related to DNA education focuses on creating awareness of the relationship between forensic science more broadly and law in universities. This is not recommended with the sole aim of encouraging the teaching of criminal law students about the scientific principles behind DNA evidence. It also seeks to encourage the introduction of information about how the adversarial legal system works in practice in courses for forensic science students. While the NAS report[40] suggests that university studies might incorporate more information about forensic science in legal curricula, Victorian and ACT lawyers who participated in this study do not consider this to be the optimal time to learn about the science of DNA evidence. Nevertheless, they do see value in forensic *studies* programs[41] where information about the intersection between science and law is presented, particularly if they offer contributions from a variety of sources, including law schools, law

[39] See 7.2.2 at p 187-190.

[40] NAS Report, above n 1, 73.

[41] See Henry F Fradella, Stephen S Owen and Todd W Burke, 'Building Bridges Between Criminal Justice and the Forensic Sciences to Create Forensic Studies Programs' (2007) 18(2) *Journal of Criminal Justice Education* 261.

enforcement agencies and criminology departments. Such programs may build inter-institutional relationships and foster general understanding and knowledge of where to find further information. The more that universities incorporate such inter-disciplinary material into their programs, the more likely it is that the barriers between scientists and legal professionals will be reduced and improvements in education and communication will be achieved.

Professional conferences also provide educational offerings on DNA evidence, but most significantly for lawyers, they provide opportunities to speak to experts and build co-operative relationships in areas that are most relevant to their criminal law practice. This thesis recommends that lawyers be encouraged to attend the forensic conferences that are available, like that of the Australian and New Zealand Forensic Science Society and other accredited organisations. Attendance at such conferences might be promoted if a greater number of CPD points were allocated for criminal lawyers to attend, and workplace support provided for those working in governmental legal organisations as well as support from other barristers in Chambers for those working independently.

It would be remiss of this thesis to overlook the value of practical training, workshops and seminars, despite the fact that most lawyers interviewed for this study consider the material presented at such events to consist of repeated basic scientific principles. This thesis recommends that workshops and seminars be practically focused, looking at recent cases, scientific developments and how they might affect lawyers. These sessions should be tailored to the particular needs and areas of interest of the lawyers participating. The value of practical training, workshops and seminars appears to reside principally in the information that they can convey about lessons learned in previous cases or about the application of DNA evidence in a practical way in a legal context. This thesis recommends that these events continue to be offered to lawyers but in a form that recognises that their particular value lies in enabling lawyers to share 'lessons learned' from working with DNA evidence. Attendance at education programs or workshops of this kind with a focus on forensic evidence and DNA evidence is likely to hinge on their being offered to lawyers at varying times. These times might be during paid work hours, around other legal commitments, or outside of paid hours if lawyers agree to participate. It is further recommended that lawyers be paid for attending, that attendance be recognised with CPD points and that the subjects covered be most relevant to those lawyers attending. Education programs like workshops and seminars should also be devised with the tactical considerations of lawyers in this area and the adversarial nature of the legal system in mind but with the objective of promoting the abandonment of such conventions at least when they limit the acquisition of understanding of DNA evidence. Such programs might also promote a greater level of co-operative communication and

effective exploration/investigation of DNA evidence by experts and lawyers in cases where they are mutually involved to maximise lawyers' understanding of the specific evidence they are dealing with.

8.5.3 Recommendations: the communication of DNA evidence

Improved communication about DNA evidence between lawyers and scientists and between prosecutors and defence lawyers will not only improve knowledge of DNA evidence but may also reduce miscarriages of justice. Errors like that which happened to Jama are less likely to occur when those involved in the collection, analysis and presentation of the evidence do not work in silos and provide greater access to information. This thesis makes three recommendations specific to the area of communication of DNA evidence.

It is acknowledged that the provision of forensic services in Victoria and the ACT is unlikely to extend in the near future beyond the State-funded laboratory structure where the majority of samples are tested at the present time. Nevertheless, because both defence and prosecution lawyers recognise the value of communicating with DNA experts, it is recommended that measures be adopted to support and encourage such communication and, where defence lawyers are concerned, to improve their opportunities to engage in such communication. This may occur with organised events that bring experts and lawyers together for social and educational reasons, like workshops, seminars or forensic committee meetings with a social focus. It is every lawyer's responsibility to be informed about the evidence they are dealing with at trial and this involves understanding reports, proofing experts and understanding the evidence so that it may be elicited effectively and cross-examined rigorously. Accordingly, relationships must be formed and cultivated between lawyers and forensic scientists so that there may be open communication between them when lawyers have concerns, misunderstandings or questions about DNA evidence in any cases in which they act. If tactical concerns continue to prevent lawyers from talking to forensic biologists in their own jurisdiction at organised events like those recommended here, then access to, and relationships with, interstate experts must be improved and cultivated through online portals, groups or national conferences.

The second recommendation in this area overlaps with one discussed earlier and that is for organisations, employers and individual lawyers to create further opportunities for forensic scientists and lawyers to connect, for example, at conferences held by ANZFSS.[42] Taking this recommendation further, the Australian Academy of Forensic Science (AAFS)[43] has chapters in the ACT and Victoria and lawyers need to take advantage of groups such as these in order to learn more and communicate more

[42] See experience of L32 (22 June 2011) at 192.

[43] Australian Academy of Forensic Science <www.forensicacademy.org>.

with professionals from the forensic sciences. Both the Victorian and ACT chapters of the AAFS are currently chaired by lawyers.[44] Establishing a Chapter in every jurisdiction of Australia would help facilitate development of these relationships and improve communication as a result of meetings and events held by AAFS. This would help limit the problems with communication noted above at 6.5 of this thesis[45] and facilitate gaining the benefits associated with learning from experts noted at 7.3.1.[46] Only when these relationships are formed may the benefit of learning from experts in their own field be truly realised by Australian criminal lawyers.

The third recommendation in this area is supported by Howes's research.[47] It is that forensic biology reports be made easier for lawyers to understand and that they be written in plain English language that is easier for lawyers to follow. If this language is used by forensic scientists, then more information about the collection and analysis of the DNA evidence may be included in reports without overwhelming lawyers. This information may provide the basis for further conversations with experts or further investigation by lawyers.

8.5.4 Recommendations: pre-trial information

The more information a lawyer can gather about a case in the early stages of investigation, the more able he or she will be to decide whether to proceed with prosecution or, in the case of the defence, how best to defend a case for a client. A recommendation about the availability of more clearly written forensic reports has been made above. This thesis further recommends that lawyers have access to a 'bank' of online written materials and videos, created for the purpose of providing them with information pre-trial and ensuring the adequacy of their knowledge and understanding of DNA evidence.

This recommendation is for the creation of online resources including written materials and videos, to assist lawyers who may suspect an error in forensic procedure in a criminal case. These may be made available as part of an online portal as recommended at 8.4.5 above, or as part of a Law Society's website. Those resources need to include not only information about the process that lawyers should follow when they want to ensure the quality and strength of the DNA evidence, but also the questions that they should ask in order to be assured of the strength of the evidence. As noted above at 8.4.2,

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[44] The ACT Chapter is chaired by Justice Richard Refshauge SC and the Victorian Chapter is is chaired by John Champion, currently the Director of the Office of Public Prosecutions in Victoria.

[45] See 171-179.

[46] See 195-200.

[47] Loene M Howes et al, 'The Readability of Expert Reports for Non-Scientist Report Users: Reports of DNA Analysis' (2014) 237 *Forensic Science International* 7.

this recommendation is supported by the appreciation lawyers interviewed for this study expressed for the advice provided by Kirsten Edwards in 'Ten Things Lawyers Should Know About DNA Evidence'.

8.6 Application of the research outside Victoria and the ACT

Victoria and the ACT were chosen for this research because of the industry partnership with Victoria Police, the Australian Federal Police and the National Institute of Forensic Science, all of whom were involved in Australian Research Council funded research based at the University of Tasmania and in funding the scholarship through which this study took place. These industry partners supported academic partners at the University of Technology, Sydney and the University of Lausanne, Switzerland. Forty lawyers responded to a request to participate in this study, and those who participated represented lawyers with a wide range of experience, a variety of roles and length of practice. The experiences of the lawyers, judges and forensic scientists in these jurisdictions is unlikely to be unique and, therefore, the findings and recommendations of this research may be relevant Australia wide. They may also be transferable to other adversarial legal systems worldwide. Accordingly, the findings of this study may be useful in explaining the practical considerations that influence the way criminal lawyers deal with DNA evidence in other Australian States, or indeed in other countries that have adversarial criminal justice systems.

8.7 Further research

There remains a dearth of research of relevance to lawyers in their daily criminal practice, and particularly with regard to the use of DNA evidence in adversarial criminal justice systems. This is because much of the reporting and research in this area has focused on miscarriages of justice, on jurors and their understanding of DNA evidence or on the failings of lawyers and others in cases involving DNA evidence. This thesis has fulfilled its purpose of making a contribution to our understanding of what specific information and knowledge lawyers need if they are to manage DNA evidence effectively; how they learn in the workplace about DNA evidence and what matters influence their ability to learn about and become skilled in dealing with DNA evidence. However, this thesis does not purport to deal comprehensively or exhaustively with these matters. There is much still to learn. The recommendations made in this thesis are of a practical nature. Ideally their implementation should be accompanied by in built evaluation processes. This will enable their on-going adaptation as and when necessary and also help to establish which measures work best. Additionally, having established that systemic barriers exist to lawyers' effective communication with DNA experts, questions then arise about how resistant to change they may be — whether it may be sufficient to encourage this to occur, as recommended by this thesis, through educational and cultural processes

and adaptations or whether it may be necessary to adopt more stringent interventions like the institution by courts of formal pre-trial processes that mandate the occurrence of such communication, including in the way recommended at para [1.4.1], perhaps via pre-trial directions hearings.

8.8 Conclusion

This research brings together science and law in a practical way. It helps policy makers, researchers and legal professionals understand how lawyers deal with DNA evidence in Victorian and ACT criminal cases and what the constraints are on the way they manage this evidence. This thesis argues that to create change and improve understanding of complex scientific evidence like DNA evidence in Australian jurisdictions, we must first understand the exigencies imposed by their working environment on how lawyers conduct criminal cases. If we do not understand the effect of adversarial legal and practical influences on legal practice, then recommendations made by investigative reports for improved practice by lawyers will remain unrealised. This final chapter has summarised the findings of this qualitative investigation. It makes recommendations in four key areas — countering the adversarial influence of the Australian criminal justice system, DNA education, communication of DNA evidence and improving pre-trial knowledge and information on DNA evidence. These take into account the difficulties that lawyers experience in dealing with DNA evidence in practice and the cultural environment in which they conduct their busy criminal law practices. The greatest challenge will be in changing or influencing a legal culture that has developed alongside the adversarial legal system that operates in Australia. This adversarial system needs to find mechanisms, like those in the recommendations made in this thesis, to keep pace with the technological changes affecting both criminal behaviour and the detection of criminals in contemporary society.

9 Appendices

9.1 Appendix A – University of Tasmania ethics approval

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HUMAN RESEARCH ETHICS COMMITTEE (TASMANIA) NETWORK

UTAS

19 April 2011

A/Prof Roberta Julian
Government
Private Bag 22
Hobart Tasmania

Dear A/Prof Julian

Re: MINIMAL RISK ETHICS APPLICATION APPROVAL
Ethics Ref: H0011621 - The effectiveness of Forensic Science in the Criminal Justice System. 'Securing Justice: the role lawyers play in maintaining the integrity of DNA evidence in criminal trials'.

We are pleased to advise that acting on a mandate from the Tasmania Social Sciences HREC, the Chair of the committee considered and approved the above project on 19 April 2011.

Please note that this approval is for four years and is conditional upon receipt of an annual Progress Report. Ethics approval for this project will lapse if a Progress Report is not submitted.

The following conditions apply to this approval. Failure to abide by these conditions may result in suspension or discontinuation of approval.

1. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval, to ensure the project is conducted as approved by the Ethics Committee, and to notify the Committee if any investigators are added to, or cease involvement with, the project.

2. Complaints: If any complaints are received or ethical issues arise during the course of the project, investigators should advise the Executive Officer of the Ethics Committee on 03 6226 7479 or human.ethics@utas.edu.au.

3. Incidents or adverse effects: Investigators should notify the Ethics Committee immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.

A PARTNERSHIP PROGRAM IN CONJUNCTION WITH THE DEPARTMENT OF HEALTH AND HUMAN SERVICES

4. Amendments to Project: Modifications to the project must not proceed until approval is obtained from the Ethics Committee. Please submit an Amendment Form (available on our website) to notify the Ethics Committee of the proposed modifications.

5. Annual Report: Continued approval for this project is dependent on the submission of a Progress Report by the anniversary date of your approval. You will be sent a courtesy reminder closer to this date. **Failure to submit a Progress Report will mean that ethics approval for this project will lapse.**

6. Final Report: A Final Report and a copy of any published material arising from the project, either in full or in abstract, must be provided at the end of the project.

Yours sincerely

Ethics Officer

9.2 Appendix B – Victoria Police ethics approval

VICTORIA POLICE

National Liaison and Research Unit
Strategy and Policy Division
Corporate Strategy and Governance Department

Victoria Police Centre
Tower 1, Level 5
637 Flinders Street
Docklands VIC 3008
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Telephone 9247-3690
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Email ethics.committee@police.vic.gov.au
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19 June 2012

Ms Katherine Cashman
TILES and Faculty of Law
University of Tasmania

Email: Katherine.cashman@utas.edu.au

Dear Ms Cashman,

Re: VPHREC 175_12: Lawyers and DNA: Understanding and challenging the evidence

Thank you for your recent application to the Victoria Police Human Research Ethics Committee (VPHREC). Your revised application and responses to the Committee's queries were considered out-of-sessions.

I am now in a position to advise you that your revised application dated 28 May 2012 has received formal approval for the duration of the project, including any approved extension.

I draw your attention to the terms of the 'Declaration by researcher(s)' in your application, including the following requirements:

- To provide progress reports to VPHREC by 30 June and 31 December each year for the duration of the research project;
- To provide a final report and a copy of any published material at the end of the research project, and
- To notify VPHREC in writing immediately if any change to the project is proposed and await approval before proceeding with the proposed change.

If you have any queries or require further clarification please contact the VPHREC Secretariat on the contact details above.

Yours sincerely,

Dr Georgina Lee
Acting Secretariat, Victoria Police Human Research Ethics Committee

9.3 Appendix C – Participant information sheet

Plain Language Statement

This information sheet is for you to keep.

Principal Researchers: Mrs Katherine Cashman, Associate Professor Roberta Julian, Dr Sally Kelty, Ms Terese Henning

Project Title: The Effectiveness of Forensic Science in the Criminal Justice System: Lawyers and DNA - Understanding and Challenging the Evidence

Invitation

You are invited to participate in a research study for the purposes of a PhD co-supervised by the Tasmanian Institute of Law Enforcement Studies (TILES) and Faculty of Law at the University of Tasmania. The research forms part of a study on the effectiveness of forensic science in police investigations and court trials, focusing specifically on lawyers and the use of DNA evidence.

The research is being conducted by PhD Candidate Katherine (Kate) Cashman, supervised by co-investigators Associate Professor Roberta Julian and Dr Sally Kelty from TILES and Ms Terese Henning from the Faculty of Law.

The aim/purpose of the research

The purpose of this study is to identify the role and perceptions of lawyers in the forensic science process – specifically with regard to DNA evidence.

By understanding how lawyers approach and deal with DNA evidence, who they talk to for information and what guidance/education they receive, we can assess how professional training organisations may better equip themselves for teaching lawyers about DNA, or if indeed this is the best way to help lawyers understand this complex type of evidence.

By asking lawyers about their experiences with DNA and forensic scientists about their experiences with lawyers, and the problems associated with this interaction, problem areas may be identified, and

potential solutions can be considered. This should enable lawyers to better prepare themselves for criminal trials involving DNA, have access to relevant material and training and better identify where there is a gap between knowledge and practice and in communication between forensic scientists, police officers and lawyers.

Why have I been invited to participate?

You have been invited to participate in this study because you are a forensic biologist who has prepared forensic reports for lawyers and/or appeared in court as an expert witness regarding DNA evidence.

What does the research involve and how much time will it take?

Approximately 40 lawyers and 10 Supreme Court judges have been involved in this qualitative study to date. Three quarters of the data has been collected from barristers and solicitors from offices of Public Prosecutions, Legal Aid, and the Private Bar in Victoria and the ACT. Focus groups with Supreme Court judges have been conducted in these two jurisdictions, with forensic scientists in both jurisdictions as the final two focus groups to undertaken. Academics and lawyers from outside the project jurisdictions of Victoria and the ACT have also been interviewed and an international comparative analysis is planned for late 2012.

I would like to invite you to participate in a focus group that will run for between 1-1.5 hours (longer if all participants wish). There will be a maximum of 8 of you in this group. This will be audio-recorded and later transcribed.

I am interested in your experience with lawyers and their understanding of DNA evidence, how they analyse it and/or present it and what role you think that lawyers should play in this process, if any. It is important that you understand that your involvement is this study is voluntary. While we would be pleased to have you participate, we respect your right to decline. There will be no consequences to you if you decide not to participate. If you decide to discontinue participation at any time, you may do so without providing an explanation.

Being in this study is completely voluntary - you are under no obligation to consent to participation. If you do decide to participate you may withdraw at any stage prior to transcripts being coded (after this point you cannot be identified in any way and it will not be possible to find your data to destroy) or avoid answering questions which you feel are too personal or intrusive.

Are there any risks to me if I participate?

I understand that participation in a focus group may involve some risk. The risk is that although information provided will be treated confidentially by the researcher, the researcher cannot guarantee that confidentiality will be maintained by other focus group members. I understand that the researcher will address this risk by asking focus group members to treat all information they hear in the room as confidential and by encouraging participants to refrain from using names of other individuals involved and in cases.

This focus group is also likely to include colleagues of yours and this may be a small group of up to 8 people. You accept that the researcher will attempt to mitigate this risk not only by requesting this courtesy from all participants at the beginning of the session, but also ensuring that the focus is on the role of the lawyer in the forensic legal system more broadly – rather than asking for particular case examples.

If after the group you feel concerned about any issues raised there are a number of options you can take. You can contact the Victoria Police Employee Support Services on (03) 9301 6900. The Police Association and the Community and Public Sector Union also offer support services for members. Alternatively you can contact the principal researcher, Ms Katherine Cashman, by telephone (03 6226 2721). Names of participants in the focus groups will not be published.

Payment

There are no rewards offered for taking part, financial or otherwise.

Storage of data and confidentiality of information

Over the course of the study, the focus group data will be in a lockable filing cabinet, in a locked office at the Faculty of Law, and, to further ensure confidentiality, the consent forms will be held separately in a lockable filing cabinet in a locked office at TILES, University of Tasmania. The only people that will have access to that information will be myself and my supervisors.

After information has been collected, participants will be assigned unique codes eg FS1, FS2, and once information has been coded, the original identifying information will be destroyed, leaving only the unique code as an identifier and the original information as non-identifiable. Because the coding process will leave both you and your information non-identifiable, we will not be able to withdraw your data after coding has taken place. Data entry will be conducted by Katherine Cashman and may involve the assistance of my supervisors.

Data will be stored for a minimum of five years and then either erased (if virtual) or shredded (if in paper format). The DVDs containing the audio recordings will be destroyed.

Additional Information for Participants

Participants should be aware that Section 127A Police Regulation Act 1958, 'Unauthorised disclosure of information and documents' states:

(1) A person who is a member of police personnel must not access, make use of or disclose any information that has come into his or her knowledge or possession, by virtue of his or her office or by virtue of performing his or her functions as a member of police personnel, if it is the member's duty not to access, make use of or disclose the information.

Section 95 of the Constitution Act 1975 provides that officers in the public service must not:

(a) publicly comment upon the administration of any department of the State of Victoria.

(b) use except in or for the discharge of this official duties, any information gained by or conveyed to him through connection with the public service; or

(c) directly or indirectly use or attempt to use any influence with respect to the remuneration or position of himself or of any person in the public service.

Results

If you would like to be informed of the aggregate research finding, please contact Ms Katherine Cashman on (03) 6226 2721 or Katherine.Cashman@utas.edu.au. There will also be a place on the Consent form for you to indicate whether you would like to receive results and if so, to indicate your preferred method of contact.

If you would like to contact the **researchers** about any concerns or aspects of this study, please contact:	If you have a complaint concerning the manner in which this research ***Lawyers and DNA*** is being conducted, please contact:
Ms Katherine Cashman	**Secretariat** Victoria Police Human Research Ethics Committee Corporate Strategy and Governance Department

T: 03 6226 2721 or F: 03 6226 7623 Email: Katherine.Cashman@utas.edu.au Associate Professor Roberta Julian on T: 03 6226 2217 or F: 03 6226 2864 Roberta.Julian@utas.edu.au.	Level 5, Tower 1 Victoria Police Centre 637 Flinders Street Docklands VIC 3008 Tel: +61 3 9247 6756. Fax: +61 3 9247 6712 Email: ethics.committee@police.vic.gov.au Or Tasmanian Social Science Human Research Ethics Committee, the Executive Officer of the HREC (Tasmania) Project Number: H11621 T: 03 6226 7479 human.ethics@utas.edu.au

Thank you for taking the time to consider this study. If you wish to take part, please sign the attached consent form. This information sheet is for you to keep.

Roberta Julian

Katherine Cashman Terese Henning Sally Kelty

9.4 Appendix D – Interview consent form

Consent Form - Interviews

Principal Researchers: Mrs Katherine Cashman, Associate Professor Roberta Julian, Dr Sally Kelty, Ms Terese Henning

Project Title: The Effectiveness of Forensic Science in the Criminal Justice System: The role lawyers play in maintaining the integrity of DNA evidence in criminal trials.

1. I have read and understood the 'Information Sheet' for this project.
2. The nature and possible effects of the study have been explained to me.
3. I understand that the study involves participating in a 1 hour interview to discuss the involvement of lawyers in criminal trials involving DNA evidence.
4. I understand that the interview will be recorded (by audio-taping or note-taking) and the information will be stored on secure University of Tasmania premises for up to five years, and will then be destroyed.
5. Any questions that I have asked have been answered to my satisfaction.
6. I understand that any information that is on the public record may be identifiable, however the researchers will keep my identity confidential and that any information I supply to the researchers will be used only for the purposes of the research.
7. I agree to participate in this investigation and understand that I may withdraw at any time without any effect. I understand that after coding has taking place my identity and information will be non-identifiable and I will not be able to withdraw my data from the study.
8. I agree/do not agree to having the interview audio-taped.

PTO

Name of Participant:	
Signature:	Date:
Statement by Investigator	

☐	I have explained the project & the implications of participation in it to this volunteer and I believe that the consent is informed and that he/she understands the implications of participation.

If the Investigator has not had an opportunity to talk to participants prior to them participating, the following must be ticked.

☐	The participant has received the Information Sheet where my details have been provided so participants have the opportunity to contact me prior to consenting to participate in this project.

Name of Investigator	
Katherine Cashman Signature of Investigator	

9.5 Appendix E – Focus group consent form

Consent Form – Focus Groups

Principal Researchers: Mrs Katherine Cashman, Associate Professor Roberta Julian, Dr Sally Kelty, Ms Terese Henning

Project Title: The Effectiveness of Forensic Science in the Criminal Justice System: The role lawyers play in maintaining the integrity of DNA evidence in criminal trials.

1. I have read and understood the 'Information Sheet' for this project.
2. The nature and possible effects of the study have been explained to me.
3. I understand that the study involves participating in a 1 hour focus group to discuss the involvement of lawyers in criminal trials involving DNA evidence.
4. I understand that the focus group will be recorded (by audio-taping or note-taking) and the information will be stored on secure University of Tasmania premises for up to five years. The information will then be destroyed.
5. Any questions that I have asked have been answered to my satisfaction.
6. I understand that any information on the public record may be identifiable. Although the researchers will attempt to encourage all focus group members to keep the information confidential, I understand that this cannot be guaranteed.
7. I agree that research data gathered from me for the study may be published provided that I cannot be identified as a participant in either the thesis, or resulting publication.
8. I agree to participate in this investigation and understand that I may withdraw at any time without any effect. I understand that after coding has taking place my identity and information will be non-identifiable and I will not be able to withdraw my data from the study.

PTO

Name of Participant:		
Signature:		Date:
Statement by Investigator		
☐	I have explained the project & the implications of participation in it to this volunteer and I believe that the consent is informed and that he/she understands the implications of participation.	
If the Investigator has not had an opportunity to talk to participants prior to them participating, the following must be ticked.		
☐	The participant has received the Information Sheet where my details have been provided so participants have the opportunity to contact me prior to consenting to participate in this project.	
Name of Investigator: Katherine Cashman		
Signature of Investigator:		

9.6 Appendix F – Interview Questions

The Effectiveness of Forensic Science in the Criminal Justice System:

Lawyers and DNA – Understanding and Challenging the Evidence

The list of potential areas we will explore in our interviews includes:

1. **Do criminal lawyers receive direction/training on DNA evidence for criminal trials?**
    a) How do practicing criminal lawyers remain current in their knowledge of DNA and forensic science?

2. **What level of understanding do lawyers have of DNA evidence in criminal trials?**
    a) What are the major threats to the accuracy of DNA evidence in criminal trials?
    b) What knowledge do lawyers have about contamination of evidence?
    c) Do lawyers understand the identified limitations of DNA evidence?
    d) What level of understanding do lawyers have of the potential human error involved in forensic science and more particularly DNA collection and analysis?

3. **What is the process involved when lawyers are faced with criminal cases involving DNA evidence?**
    a) Do lawyers ask questions of forensic scientists?
    b) If so, what questions do lawyers ask of forensic scientists?
    c) Do lawyers ask questions of police investigators re the DNA evidence?
    d) If so, what questions do lawyers ask of police investigators?
    e) What makes an effective criminal lawyer in cases involving DNA evidence?
    f) What do lawyers do to protect their clients from possible DNA contamination?

g) What do case examples demonstrate of prosecutors and defence lawyers action or inaction in criminal cases involving DNA evidence?

h) Should prosecutors proceed with cases when there is only DNA evidence linking a suspect to a crime?

i) What have the courts said of prosecutions when DNA evidence is the only circumstantial evidence for a case?

9.7 Appendix G – Focus group questions

The Effectiveness of Forensic Science in the Criminal Justice System:

Lawyers and DNA – Understanding and Challenging the Evidence

The questions we will explore in our focus groups are the following:

- What experiences have you had with lawyers on cases with DNA evidence that you have provided?
    - What experience have you had with lawyers consulting you about DNA evidence during the pre-trial investigation phase?
- How do you feel lawyers understand DNA evidence?
    - How do you find they explain it for judges/juries?
- How much should lawyers understand about DNA evidence in criminal trials?
    - What can they do better?
- How should we endeavour to teach lawyers about DNA?
- From your experience, how does a competent lawyer deal with DNA evidence?

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