Juror Comprehension and the Hard Case – Making Forensic Evidence Simpler:

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Abstract

The complexity/comprehension nexus as it impacts on juror decision-making is addressed in the particular context of prosecution-led DNA evidence. Such evidence is for jurors the subject of pre-trial preconceptions, and is notoriously difficult to present and argue before a jury. The article looks at the comprehension of forensic evidence by jurors, a task qualified by the opinion of legal professionals whose responsibility it is to present and interpret such evidence in adversarial contexts.

Jurors were surveyed post-verdict in trials where forensic evidence featured in circumstantial cases. These insights into comprehension were qualified by contesting views of legal professionals, and critical reflections from independent observation teams regarding the manner in which this evidence was used and its intended impact on the jury. What results is both declared and implicit indicators of comprehension, not so much against broad measures of complexity (Findlay, 2001), but rather the particular place of popularly endowed forensic evidence within the circumstantial case.

The article explores the utility of a multi-methodological study of comprehension from the perspectives of the proponents, commentators, recipients and observers of the adversarial contest. To this is employed a interactive analysis of important decision-sites and relationships of influence in the trial as they may impact on comprehension and be measured as 'complex'.

Introduction

In earlier work on juror comprehension and trial complexity (Findlay, 2001) I concluded that, amongst other strategies for enhancing understanding, the assumed inverse relationship between comprehension and complexity needed to be contextually tested. Recently we had the opportunity to do this with trials in New South Wales[2] featuring

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[2] This is a common law State of Australia where jury trial is used to deliberate serious criminal offences. In these instances homicide, sexual assault and robbery trials were heard before both the Supreme and the District Courts in Sydney.

evidence about DNA (Findlay, 2003; Findlay and Grix, 2003).[3] The research set out to explore how jurors responded to evidence perceived by them as both forensically powerful and scientifically complicated. Would juries struggle to understand such evidence that they were popularly conditioned to respect[4], but which experts and lawyers tended to confuse? What would be necessary in the presentation of such evidence at trial (or pre-trial) to enhance comprehension?

The juror survey detailed in this paper was a unique component of a wider multi-methodological study designed to test the effectiveness of legislative provisions governing forensic evidence[5]. Other empirical surveys involved prosecution and defence lawyers with experience of presenting forensic (and particularly DNA) evidence in jury trials.[6] Unstructured interviews with the judges presiding over the surveyed jury trials complemented the juror observations. Independent research observations of these trials were 'mapped' by members of the team. Finally, the impressions gained from these exercises were put to broad discussion in three focus groups constructed around legal professional, investigation, and scientific stakeholders.[7]

This paper describes in a holistic fashion the findings of the research exercise. While data collection in the form of surveys was systematic and rigorous, sample populations were small[8]. The adaptive and integrated nature of the wider methodology means that an exclusive (or even preferential) reliance on empirical data would not allow for the fullest application and appreciation of the more cognitive components of the work. Also, confidentiality requirements surrounding our permission to interview jurors[9] necessitated that their opinions be presented in an impressionistic, rather than a statistically definitive fashion.

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[3] The delay in publishing this data was agreed to avoid any possible impact on the appeal process or retrials in the cases surveyed.

[4] Even the most general content analysis of crime and justice entertainment reveals the recent prominence of forensic evidence, and DNA in particular, as crucial keys in the solving of complex investigations.

[5] For a discussion of this research and the methodology employed see Findlay M, (2003) *Independent Review of the Crimes (Forensic Procedures) Act 2000*, Sydney: Criminal law Review division, at http://www.lawlink.nsw.gov.au/lawlink/clrd/ll_clrd.nsf/pages/CLRD_forensics_report (hereafter referred to as The Report, chap 2.

[6] The Report, chap 5.

[7] In addition to the original research agenda, the team examined all DNA cases in the jurisdiction in the recent past, and conducted a narrative analysis of sentencing transcript. Police statistics on DNA testing (and those available from the Department of Corrective Services, and the Division of Analytical Laboratories) were also investigated against legislative criteria (see The Report, chap 3). The historical development of the relevant legislation was chartered and compared with other jurisdictional experience.

[8] The nature of the work and its sensitivity meant that our access to lawyers and judges was limited and the appropriate trials available to us over the research period were few. Twenty five Crown and Police Prosecutors were surveyed and seven Public Defenders. This number was augmented by additional input from the lawyers in the first two focus groups. Seven judges were interviewed. Our commitment to confidentiality does not allow a specific figure of jurors interviewed to be nominated. Suffice to say that 7 trials were surveyed and the response rate ranged from70-100%.

[9] In the research jurisdiction, permission to interview jurors must be sought from the Attorney General. It may otherwise be an offence to solicit the identified opinion of jurors following trial. A condition of our approval was that nothing in the analysis of the data should have the potential to identify the trials and particular jurors involved.

With this in mind, the discussion of broad juror opinion precedes a more detailed exploration of three trials[10], from which specific influences on comprehension are identified and manipulated. The research method is first briefly introduced around some perennial considerations for juror comprehension.

Method

Under the auspices of a state-sponsored legislative review (Findlay, 2003) the research team was offered a unique omnibus approach to the investigation and analysis of juror comprehension. It involved:

- interviewing prosecutors involved in forensic cases
- interviewing defenders in such cases
- free-ranging discussions with judicial officers who specialized in forensic trials
- observing jury trials in which DNA evidence was contested[11];
- interviewing juries at the conclusion of these and other 'DNA trials';
- analysing the transcript narrative of the relevant trials[12]; and
- facilitating focus groups with the main stakeholders in the obtaining, analysis and presentation of forensic evidence.[13]

Fortunately for the period of the review[14] open access was available to six jury trials in which DNA evidence appeared, each in a different forensic and probative context. Their juries were interviewed immediately after the verdict was delivered and they provided particular and distinct insights into the reception of DNA evidence. Placed, where possible, against independent and detailed trial observations,[15] and the more general views of lawyers and judges, the juror responses enabled the contextual testing of assumptions about comprehension and complexity. More than this, the research enabled speculation on how pre-trial and trial practice might be enhanced to facilitate the jury's function as fact finder[16] (Findlay and Grix, 2003; Duff and Findlay, 1982).

In general, actual jury research is uniquely problematic both in its empirical validity, pressures for confidentiality, and its impact on the wider operation of the appeal

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[10] These trials were selected because they represent an interesting spread of circumstances wherein the DNA evidence was applies to the prosecution cases. They were also the trials which received the most detailed observational methodology.

[11] In two cases we also followed the prosecutors, the defenders and the judges during crucial 'non-court room' time as the trial progressed, in order to see the changing dynamics of professional participation.

[12] In particular the instructions to the jury on DNA evidence, the examination of expert witnesses and the summing up of the judge.

[13] These groups included police, judges and magistrates, advocates of all types, community workers, corrections officers, legislators etc.

[14] Six months in the second half of 2002.

[15] Where possible several observers were located in different but prominent positions within the courtroom. These included the public gallery, near the jury box, close to the bar table, and adjacent to media reporters. It was intended through this strategic 'mapping' of the trial 'dynamic' unique impressions through observation might be combined. For a more detailed discussion of this methodology in practice see, Cunneen (et al) (1888); chap 1

[16] In the two trials later detailed the researchers had detailed discussions with the judges involved concerning the manner in which they had employed pre-trial hearings or experience from earlier trials to reduce contested and complex forensic evidence to be placed before their juries.

process.[17] In the present study we accepted a need to inclusively accommodate the limitations of a strictly empirical approach to juror surveys, while at the same time recognizing that juror comprehension is dependant on the influence of other trial players, important relationships of influence,[18] and pre-trial contexts.[19]

This multi-methodological study was ripe for interactive analysis. However, problems presented themselves in such an endeavour. These included:

- how and to what extent empirical survey results should be reported where survey populations were neither representative of criminal trials over the period, or of legal professionals with experience of DNA trial argument;[20]
- whether it was valid to compare the data on juror opinions with the responses to the defender and prosecutor surveys in an empirical sense, both representing different sample populations;[21]
- how and in what form the general comments of trial judges could be reflected against the empirical survey data;
- to what extent the independent observations might be introduced along with the relevant juror and judge opinions, to give a fuller appreciation of the influence of forensic evidence in nominated trials;
- how the more general insights of focus group participants could add particular value to the surveyed opinions of trial professionals, and the attitudes of jurors;
- how the official data on forensic practice in the jurisdiction might add to other data forms; and finally
- what common themes could be convincingly drawn from the integration of such diverse forms of information and impression.

These concerns operated in addition to conventional research considerations about the nature and significance of *fact* and *value* in opinion-based data, and the extent to which either can be held to support conclusions on decision-making practice. These are particularly important considerations when moving the analysis from the opinion and impressions of various trial participants, to more general conclusions regarding the critical influences on trial-decision-making. The interest in fact and value as influences over juror decision-making (comprehension and complexity considerations in particular) additionally argued for a methodology capable of including and synthesizing empirical and cognitive understandings.

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[17] For a detailed discussion of the challenges of jury research see Duff (et al) (1992), chap 2.

[18] Such as between the judge and the jury as described in Findlay (1994), chap 5.

[19] The influence of media reporting on juror opinion for instance is examined in detail in Chesterman (et al) (2001).

[20] On this point we were confident of capturing a total population of first instance trials wherein DNA evidence featured. This, however, relied on notification from the Office of the Director of Public Prosecutions, as trials were listed and the nature of the prosecution evidence anticipated. Total populations for limited survey sizes also provide the potential to extrapolate the views of jurors within controlled trial contexts rather than seeking to generalise the opinions of jurors at large. This was more in keeping with the purpose of the present analytical exercise.

[21] As mentioned above with the juror populations we attempted total coverage, whereas with the advocates they either self selected to a postal survey, or were identified by the research team on the basis of their trial experience and surveyed in person.

For both ethical and methodological reasons the research was concerned to adequately recognize the voices of our respondents. Jurors are largely muzzled when it comes to speaking their mind on the decision-making process. Even our limited access to their post verdict opinion came at the cost of directly communicating individual views.[22] Trial advocates and judges operate in a vocal world and our survey instruments and methodology for them enabled much more narrative exchange. Where appropriate, these have been injected into the analysis to add value to the other observational formats.

Research Purpose

The purpose of this research project was to speculate whether, how and in what contexts the nature and delivery of forensic evidence influenced juror comprehension. In particular, DNA identification evidence, which is popularly considered as complex in both its nature and delivery, might provide a useful measure as to whether 'complexity' (of evidence) is inversely relational to juror comprehension. Elaborating this connection required a theory of juror impression formation central to comprehension and resultant decision-making.[23]

The manner in which the study determined to manage its data and insights was influenced by the hypothesis that juror comprehension is not only (if perhaps primarily) indicated by juror opinion. Other trial professionals such as the advocates and the judge set out to influence comprehension and their impressions of what jurors understand will also be important. The challenge was to integrate these opinions and impressions in order that a rounded and not partial exploration of comprehension against relative impressions of evidence complexity and its management in the trial. would be achieved.

Further, the preconceptions that jurors take with them into the courtroom and the deliberation process regarding,

- the influence and credibility of science; and
- popular culture about the probative value of forensic evidence,

tend to mediate both the complexity of the evidence and its reception, as well as its accessibility and influence over comprehension and later decision-making.

Juror Impression Formation and Impressionistic Analysis

Accepting for the purposes of this analysis that:

- jury decision-making is influenced by the level to which juror's comprehend the meaning and probative value of important forensic evidence;
- such comprehension will be in turn influenced by impressions about it either pre-existing or introduced by significant trial participants such as judges and advocates;
- impressions about the evidence and their impact on juror comprehension and decision-making can be legitimately commented on from the opinions of jurors, advocates and judges;

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[22] The questionnaire was approved in a closed question format. On some occasions respondents wrote their views outside the box, but these had to be managed with particular care.

[23] For a wider discussion of the dynamics of trial decision-making against pathways of influence, see Findlay and Henham (2005).

- the representation of these impressions will to some extent depend (for its detail, clarity and accuracy) on the distance of the commentator from the evidence in question, and finally
- an effective way to distill a comprehensive understanding of juror-impression formation concerning forensic evidence is to specifically contextualize the analysis within particular trial decision-sites, and to integrate the opinions of principal players in the decision process.

The 'data' with which we will be dealing is therefore the result of opinions about influences, relationships impressions and decision processes. It is impressionistic and as such dependent at least on proximity to the evidence in question. As opinion it is relative in its reception of even general degrees and indicators of complexity. As such it challenges what is recurrent in critiques of the jury (particularly regarding comprehension and complexity) drawing conclusions from outcomes alone without considering the reality of actual decision-making processes, in favour of 'common sense' supposition paraded as fact.[24]

While our focus on impressionistic 'data' may be criticised for its subjectivity we are confident that with the application of the following controls it provides a valid if limited framework for analysis:

- specific and identifiable trial contexts in which forensic evidence was considered and certain decisions were reached;
- very high and often complete response rates in the 7 trials targeted for interview;
- cross reference to the opinion of other trial participants;
- reflection on the relationships of influence in the trial which tend to impact on comprehension;
- recognition of the evidence and procedural principles which should objectively govern the probative significance of the forensic evidence in question;
- identification of the adversarial role of the expert witness and their preferred approach to evidence delivery;
- where possible, independent and objective observations of trial decision contexts and relationships; and
- commentary on pre-trial or extraneous influences on impression formation, such as the representation of DNA investigation 'science' in popular culture.

So to further moderate this impression 'data' the findings of the juror and the advocate surveys were put to discussion in wider stake-holder focus groups. These then were added to the integrative mix. The diverse opinions of those influential over evidence presentation and interpretation (and hence juror comprehension) are presented against each other throughout the analysis to identify the various interpretations of what makes forensic evidence complex, and thereby influences juror decisions.

In writing up the analysis we were also keen to reflect the *nature of relationships* preceding and during the trial, which we anticipated would have an influence over juror

[24] See, Harding R., in Findlay and Duff (eds.) (1988): pp74-94.

impression formation and comprehension.[25] Some of these, such as the advocate and the expert witness possess clear and apparent motivations for impression formation, depending on the side of the case they represent. Others, such as the judge and the advocate or the judge and the juror, might be more implicit but no less influential.

We have not constantly distinguished when opinion data is *first person* and where it is *third person commentary* (for instance where a jury respondent is evaluating how she thought, rather than the impression an advocate may have on how evidence influences the juror's decision). It is assumed that from the nature of the relationship or interaction being discussed, the form of opinion will be obvious.[26] Also, the proximity to the evidence, its presentation, interpretation and application will also be indicative.

Throughout the analysis we relate back where appropriate to legal/normative frameworks that should constrain the reception of forensic evidence into juror decision-making. As with media influence, or popular culture pre-conceptions about the significance of DNA identifiers, these should provide some benchmark predictors of influence over decision-making. But like any formal or less formal influences one needs to take care in apportioning significance and ignoring the integrated impact of many factors in the mind of the juror.

If the impression formation process runs contrary to any of these formal influences in particular, or they themselves compete, then this provides another level of insight into the relative significance of certain evidence forms and their representation. Measures of trial complexity are not sufficiently agreed or non-problematic to be incorporated into any such normative comparison (Findlay, 2001). Even so, it seems well-settled in trial practice that the presentation and explanation of DNA identification evidence is sufficiently complex as to provide a yardstick for the complexity/comprehension nexus.

Analytical Framework

The deeper research analysis across trial participation and experience addressed the following questions:

1. How does evidence presentation impact on juror confidence in discharging their fact-finding duties (and what is the role of the advocate and expert witness in this)[27]?
2. How does the particular presentation of forensic evidence influence juror comprehension (particularly when the presentation is made either simply or in a complex fashion)?
3. How does the context of the forensic evidence (what it is meant to establish, and what is in dispute) influence comprehension?
4. What is the role of judicial intervention in all of this (particularly in the creation of a juror decision-making 'community)?

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[25] In Findlay and Henham (2005) we detail how these 'pathways of influence' inform and construct trial decision-making such as juror verdicts (see Chap 3).

[26] Also in pushing this distinction it might incorrectly suggest that first person opinion is more accurate than third person commentary.

[27] For a detailed discussion of the impact of professional intervention over juror comprehension see, Findlay & Grix, 2003.

The complexity/comprehension nexus is addressed here primarily in terms of prosecution-led DNA evidence. Juror knowledge and understanding before and during the trial is interrogated. Indicators of comprehension arise from the analysis, not so much in contrast with broad measures of complexity (Findlay, 2001), but rather more specifically against popular impressions of forensic evidence and its significance within particular circumstantial cases.

The design of the analysis falls into the following structures:

- The trial context in which the evidence was produced – including duration, circumstantial evidence, the prosecution and the defence case. *This is largely descriptive and drawn from trial transcripts;*
- What the players (trial participant) thought about evidence and issues in contest in the trial - *Initially, this is taken from responses to the jurors' surveys and then augmented by the survey results from trial advocates and the commentary of the focus groups.*
- How do context and impression ground the complexity-confusion nexus? - *these considerations involve both description and analysis of the features affecting the comprehension of forensic analysis from several contexts of complexity, and their integration. More general themes drawn from the preceding descriptions are then tested against assumptions concerning the comprehension/complexity nexus.*

Through managing the opinion 'data' regarding impression formation in this fashion against specific forensic evidence contexts the complexity/comprehension nexus is explored beyond impressions and opinion, which has been a feature of the critique of juror capacity so far. Several recurrent themes may be drawn from that critique that, while largely without empirical testing, they have been taken to confirm the assumption that jurors are less able to appreciate complex evidence than are judges or expert assessors. In particular, certain of these impressions were injected into the questions comprising the juror survey.[28] They were also considered as issues governing the analysis of the opinion responses.

Themes concerning Complexity and Comprehension in the Forensic Context

Before examining the research data in more detail it is useful to make brief comment on issues influencing the connection between forensic evidence and juror fact-finding, in order that the context of comprehension might be better established. These include confidence in the evidence, pre-trial knowledge of DNA, and the impressiveness of expert witnesses.

Confidence

In each trial observed, the judge instructed the jury that the case in question relied largely on circumstantial evidence. In such situations, forensic material, and DNA in particular it was advised, should be given no more weight than any other evidentiary component of the case. It would appear that popular wisdom carried by the jury into

[28] For instance, was the issue of consent explained to you? Do you understand the importance of consent in the taking of forensic samples?

their task to a significant degree influences or even neutralized this direction.[29] To establish this, the probative significance of the evidence in a legal sense was contrasted with a weighted scale of influence expressed by the respondents. Again, popular wisdom seemed to override probative value.

Jurors tended to approach the DNA evidence with more respect and anticipation than accorded other evidence, even other forms of forensic evidence. Reasons for this did not appear to relate alone to the relative significance accorded such evidence by the legal professionals in the case. This popular reification of DNA was enhanced by the manner in which it was introduced at trial. Experts, doctors and scientists spoke for and against certain interpretations of the evidence. Independent professionals were the medium for explaining the science and significance of DNA. Against this is cast the directions and challenges of the lawyers and judges. Jurors were subject to what has become known as 'white coat syndrome',[30] and the evidence presented by the expert was further vested with significance and credibility as a reflection of the status of the expert.[31] Even so, the pertinence which jurors accorded DNA identification, tended to go beyond the elaboration of lawyers and the detailed evidence of expert witnesses.

In each prosecution case the DNA evidence had varying degrees of utility.[32] Never was it on its own argued as conclusive. In most of the cases the DNA evidence was contested.[33] In several trials there were competing interpretations of 'matching' samples and their significance.[34] The context of the evidence in each observed trial was as a result, both confusing and complex. However, the opinion data reveals jurors were surprisingly comfortable with their knowledge of DNA evidence and its impact in a general sense.[35] This related both to the 'science' of DNA identification, and its relevance to the case as evidence. Tentative conclusions here might be that complex and otherwise confusing evidence will not of itself reduce juror comprehension. A closer look at the integrated opinion data might qualify this in that jurors were either fortunate to have well explained evidence before them, or their universal pre-conceptions of the evidence and its significance tended to downplay what otherwise might have been confusing detail.[36]

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[29] For each jury interviewed, the significance of DNA evidence was constantly rated above the actual forensic impact it had in the construction of the prosecution case. In certain instance this dislocation between perception and practice was marked.

[30] Where respect for the doctor or the scientist as a professional cloaks the role and interpretation of witness testimony.

[31] This also tended to explain the particular confusion for some jurors in comprehending and reconciling competing expert views.

[32] It was not always used to suggest the identity of the perpetrator. In one trial, for instance, mitochondrial DNA was discussed in order to suggest that bones found under the accused house were those of the victim.

[33] Interestingly, not so much in terms of the science of 'profiler plus' testing, which is used in NSW, but more on the interpretations given to the sample.

[34] In one trial where there was a mixture of DNA profiles on the sample analysed this actually formed the substance for an important defence challenge on identity.

[35] This having been said, there were many significant instances where individual jurors seemed confused about what the DNA evidence was and what it was argued for.

[36] It was clear in several trials that jurors were not clear about details of the evidence, but found it none the less convincing. These respondents also indicated pre-trial impressions of forensic evidence which were strongly positive.

This endemic confidence in the nature and significance of DNA evidence, even in trial contexts of controversy and challenge, could explain the related and common preference amongst juror respondents for more forensic evidence and more information concerning its application.

Pre-trial forensic knowledge

Most juror respondents surveyed were aware of DNA prior to their trials. They had a popular culture exposure to the power of forensic evidence tending it seems to impact on its anticipated significance and probative value from a juror perspective. Therefore, a majority of juror respondents expected (subliminally or otherwise) that such evidence would be an important element of the prosecution case, and significant for their deliberations.

In particular, these jurors:

- in a majority, were aware of DNA profiling evidence;
- expected that it would be important; and
- had this impression confirmed at trial

In this context it follows that most of the juror respondents saw the DNA evidence as crucial in proving the prosecution case and hence the guilt or otherwise of the accused. In those trials where a guilty verdict was returned[37] DNA evidence was usually considered by the jurors to be more influential than objectively its probative value should have established.

Another interesting finding from the juror surveys is that the majority of respondents felt that the experience with DNA evidence in their trial tended to confirm the significance they had placed in DNA pre-trial.

Juror confidence in DNA evidence is not all about the 'emperor's new clothes'. Popular wisdom, media and entertainment 'realities', and generic respect for the expert all set the scene for a receptive juror response to DNA evidence. Even so, the method for introducing and discussing this evidence case by case does have a bearing on levels of comprehension.[38] In the trial where the most DNA evidence was presented, by the greatest number of experts for both sides, in particular detail and for many weeks, the jurors indicated a great understanding of the DNA evidence, and highly rated its significance.[39]

Having said this, issues regarding the objective complexity of the evidence and of the nature of its presentation within specific trial contexts tended to be mediated by pre-trial, unattached experience.

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[37] Three convictions and three acquittals.

[38] There was the occasional example where this may not have been so. Several jurors surveyed had pre-trial knowledge, a belief in the significance of DNA evidence, and the wish to see sampling expanded while at the same time confessing some confusion about the nature of the evidence in their specific case, and with the way it was explained.

[39] Interestingly here, jurors did not want additional forensic evidence to assist their understanding, nor more information about it, but they advocated an expansion of powers to require DNA samples from suspects.

Role of the professionals

The survey of jurors invited comment about the apparent relationship between expert witnesses and the advocates in the trial. Where jurors observed cooperation between the scientists and the lawyers when presenting and examining DNA evidence, not unusually the comprehension of those issues tended to be higher.[40]

In one trial the judge required the prosecution and the defence to declare and argue those issues of forensic evidence in contest, pre-trial. He then determined what was agreed and what was not prior to its introduction to the jury. In this trial, again, juror comprehension of forensic evidence was highly rated.

Where there were disputes and challenges between lawyers and expert witnesses, and the relationships between them were hostile or confrontational, this appeared to have an adverse influence on juror comprehension. It did not, however, seem to have any predictable or consistent influence on verdict.[41]

Obviously there are other themes that indicate the nexus between complexity and comprehension. Trial duration, number of accused, the extent of documentary evidence, and the scope of contested facts are just some of the additional features which have been suggested. For the purposes of the following analysis we have focused on those characteristics tending to evolve from the relationships (pre-trial and within the trial) and as such having a direct association with DNA identification evidence. This is because we have selected the integration of influences as a specific and measurable indicator of complexity within these trials. The manner in which the different trial players, and pre-trial commentators construct and present forensic evidence we suggest, works in an integrated fashion to create or reduce complexity at various stages of the jury decision-making process.

The initial point of call for understanding the importance of forensic evidence for the complexity/comprehension nexus was the voices of jurors in the trials selected. Some general impressions merit comment prior to addressing the specifics of each trial context.

The Surveys - Juror Interviews

A unique element of the research methodology was the opportunity to interview jurors following the delivery of their verdict, in 7 trials wherein DNA evidence was a feature.[42]

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[40] In one trial in particular where both the prosecutor and the defence lawyers concurred on the manner in which the science of the DNA sampling was put to the jury, juror comprehension of this and the inferences to be drawn from it were high.

[41] In theory, at least, this seems strange as one might assume that the more confused a jury is about evidence they consider to be important, the more likely they would be to acquit. This may not necessarily hold – see, Findlay, 1994.

[42] Professor Eric Magnusson (Australian Defence Academy, University of NSW, Canberra) generously enabled us to jockey off his wider survey of jurors and expert evidence. He also advised on the form and content of the questionnaire. To enable these surveys to take place the Sheriff's office and the individual Sheriff's officers administered the questionnaires on our behalf. The judges in each trial actively supported the survey and introduced it to their juries. In addition, we relied on busy Director of Public Prosecutions

The juror questionnaire aimed to discover:

1. How DNA (and other forensic evidence) was used in the trial;
2. The importance of the evidence for the jury in their deliberations;
3. Factors, such as defence contest and the nature of expert presentation, which may influence juror comprehension of forensic evidence;
4. Whether crucial issues such as consent or sample matching were explained, and understood by the jury;
5. What the forensic evidence was meant to represent for the jury;
6. Whether the juror's preconceptions about forensic evidence were confirmed by the trial experience; and
7. Whether there should be more forensic evidence available to juries.

The most compelling conclusion to be drawn from the survey is that irrespective of the objective probative significance of DNA evidence (in one trial it had no such relevance whatsoever), and the reasons for its presentation, jurors anticipated that such evidence would be compelling, and such was confirmed through their trial experience. From this it can be interpreted that not all the impact of crucial evidence for both juror comprehension and decision-making depended entirely on its context within the trial. Further, complexity of forensic evidence and its moderation might need to be considered in terms of influences pre-trial as well as within the case.

The great majority of jurors interviewed wanted more DNA sampling and more such evidence at trial. It seemed that this was not always dependant upon the actual evidentiary influence of DNA for the particular prosecution case on trial. Even in a case where the DNA evidence was uncontested and as such not essential for the identification of anyone crucial to the case, the jury had their impression that DNA was important confirmed by their trial experience. It seems certainly here that this had more to do with their preconceptions about DNA than their trial-based conviction that this evidence was more important to the jury's deliberations than other evidence.

Despite the different reasons for the presentation of forensic evidence in the trials surveyed, and in particular if competing DNA interpretations were raised by the defence, whether consent was challenged and if the significance of the sample match was fully explained, jurors generally agreed that:

- forensic evidence was relatively more important for their deliberations than other evidence;
- their understanding of the case would have been improved if more forensic evidence had been put to them (with two jury exceptions); and
- more information about the forensic evidence put would have been helpful.

Where DNA was identified by jurors as significant in their deliberations, particularly for the identification of the accused, their anticipation of the significance of DNA in the trial was confirmed whether the accused challenged that evidence or not, and even where no conflicting expert evidence was advanced.

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solicitors to identify trials for our purposes. As well, without the cooperation of jurors their insights would remain with them alone.

On comprehension of the science of DNA profiling, a clear majority of respondents indicated that the concept of a 'match' was explained to them and they understood it. A smaller majority said they knew what was involved in consenting to the taking of the sample. Interestingly, several jurors declared a lack of understanding about a matched sample, or about consent, while agreeing that the DNA evidence was significant, and yet were in juries that convicted. In terms of verdict more generally, in those juries that convicted, respondents rated the significance of forensic evidence in their deliberations higher than did jurors in juries that acquitted.

Trial Case-studies

Here we have applied comparative contextual analysis within each trial and across trial experiences,[43] and incorporated trial observations and professional interviews where appropriate. In addition, the trial transcripts, sentencing remarks, and media reporting for each trial were subjected to thematic narrative analysis, which is reproduced where instructive. As mentioned earlier, all this enhanced the narrower juror survey data by indicating in what circumstances and against what forensic and trial issues, the survey responses were provided. For instance, if DNA was more central to the establishment of liability and it was contested, this may produce distinctly different responses from those given by a jury in a case where DNA was peripheral or uncontested.

The three trial case studies reveal different:

- purposes for the presentation of DNA evidence;
- degrees to which this evidence was challenged;
- expert delivery of the evidence;
- complexity associate with the nature and application of the evidence; and
- trial outcomes.

The analytical structure of the next part is complex and consequential. It is designed to apply the data from the three trials to general assumptions concerning complexity and comprehension. In what follows characteristics which are assumed to influence the complexity of the case, and hence juror comprehension, are identified for each of the three trials. They range from temporal considerations, across probative characteristics, the adversarial nature of the case, and the influences over adversarial dynamics. These are then related back to reactions and understandings of jurors and trial professionals.

The common analytical framework commences with the context of the trial (length, explanation, structure of prosecution proof, and the adversarial exchange). If context is crucial for complexity and hence comprehensions than variations in each and any of these components might be anticipated as influential on both.

The framework then moves to attitudinal considerations; perhaps the most direct data on comprehension or otherwise. The nature of the evidence, preconceptions, the status of witnesses and defence challenges are each suggested as influential.

The assumptions behind this comparative analysis are that:

[43] For a discussion of this approach to analysis in a comparative sense see, Findlay, 1999: Intro.

- trial context as it varies in crucial components (physical and experiential) will impact on complexity and comprehension; and
- juror impressions which evidence comprehension or otherwise will depend on the reception and nature of evidence presented at trial.

As the data will reveal these assumptions are differential and not simply causal. For instance, while the influence of the expert witness can be significant it is not consistent or predictable. The impact of pre-conceptions and popular culture, however, regularly outstrips the probative weight of forensic evidence in different case contexts.

Trial A:

The context in which the evidence was produced[44]

The characteristics of the trial and the nature of the opposing cases provide the context in which forensic evidence is presented in the three trials studied. In addition, trial context will suggest objective/legal standards for the probative value of this evidence for the prosecution case. Certain contextual features such as the nature of expert delivery may influence the complexity of the evidence and the opinions which jurors form as to its impact.

Circumstantial Case

The case against the accused was that he murdered his wife and disposed of her body under the house in which they were both living at the time. DNA evidence was of paramount importance to the defence case, as the victim's body was never recovered. Indeed, over the course of its closing submissions, the defence referred to the significance of the DNA evidence in the following way:

> .... It's so important to the Crown[45] case, if the Crown didn't have DNA, it would be some bones in the backyard. That in itself is something incriminating. But the whole Crown case revolves around proving that these are (the victim's) bones...[46]

This was a case where the circumstantial material evidence was limited and that DNA identification was therefore crucial to any association of the alleged body fragments with the accused, and eventual proof of guilt.

Duration

This case took approximately 10 weeks to complete. There are over 2500 pages of transcript, 70 witnesses were presented as part of the Crown case and 34 exhibits were relied upon.[47] For a murder trial where no body had been found and the prosecution largely depended on expert evidence often from witnesses outside the jurisdiction, then trial length was not out of the ordinary. Having said this, compared with average

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[44] In each trial context we have not always adopted the same structural sub-headings. This reflects the reality that certain contextual features were more relevant to complexity/confusion considerations in certain trials than in others.

[45] In Australian jurisdictions criminal prosecutions are conducted in the name of the Crown as head of state.

[46] Defence Closing: 14.10.02 at pp.3357.

[47] Crown Closing: 8.10.02 at pp.3122.

criminal jury trial duration of around 2.5 days in NSW (Findlay, 1994) this was a long trial.

Trial duration was also prolonged as a result of the care with which the judge approached the production of evidence and his associated directions to the jury on the nature and significance of evidence. This was a re-trial of the matter following an earlier hung jury[48] and the judge was meticulous in his dealings with trial advocates and jurors. Interestingly, on several occasions this appeared to produce some obvious tensions between the trial judge and particular jurors[49], which was then reflected in the resistance of one or two jurors to the survey post verdict.

Explanatory Material

Regarding their possible influence over complexity and hence comprehension two exhibits in particular were noted during the court observation of this trial, namely:

- the DNA profile extracted from the bone fragments recovered from a body alleged by the prosecution to be that of the victim; and
- the table tendered by a forensic expert for the prosecution, explaining and developing the identification probability of that profile to those of the victim's parents.

Supplementary visual aids were also used for the benefit of the jury, including a picture of a DNA nucleus on which the judge relied during his summing up. These narrative and graphic representations attained more explanatory significance where evidence was delivered through audio video communication from expert witnesses in the USA.

Prosecution Case

The judge succinctly described the relevance of the DNA evidence for the Crown case in the following way:

> The DNA evidence, the Crown suggests, is relevant in two ways. First, it is evidence which, in combination with other material, will satisfy you beyond a reasonable doubt that (the victim) is dead. The second is that the DNA evidence, together with the fact that the bones were buried in a garden of the home at ... will, it is suggested, in the context of all the other evidence, and especially the description of their relationship (victim and accused), persuade you beyond reasonable doubt that the accused caused her (the victim's) death.[50]

Defence case

It was crucial to their case that the defence questioned the allegation that the bones were those of the deceased. If doubt concerning this could be established to the satisfaction of the jury, then without a body, the remaining circumstantial evidence was irretrievably weakened. The defence employed a variety of strategies to attack the DNA evidence presented by the prosecution, which

[48] NSW at the time of the trial required unanimous jury verdicts.
[49] As noted both by research team observers and the lawyers in the case.
[50] Summing Up: 14.10.02 at pp.203.

included; continuity and contamination issues,[51] the paternity of the victim,[52] and sample mutation rates[53].

In his summing up to the jury, the judge dealt with the first two of these "preliminary issues" - that is, who were the parents of the victim; and whether the custody of the bones (i.e., continuity) could be properly accounted for? Regarding the paternity of the victim and its impact on the significance of the DNA evidence:

> ... Now the tests undertaken were designed to determine whether there was a relationship of kinship between the bones and the persons said to be the parents of (the victim). You will remember that each offspring gets half his or her nuclear DNA from their mother, and half from his or her father, and a profile is obtained, which is Exhibit AC, and that is obtained from persons said to be the parents.
>
> That profile, where it is different, may exclude one or other or both persons as parents. However, there is a match, where the DNA profile is consistent with the DNA profile of persons who are said to be the parents, then the owner of the bones, may be the offspring of those parents. And depending upon how common the particular DNA profile may be, some indication may be given of the likelihood of the bones belonging to an offspring of those parents rather than simply happening by chance.[54]

As to the issue of continuity, the judge said:

> Evidence has been given tracing the custody of the bone fragments from their discovery on the western side of the house until their examination in the U.S.A. ...
>
> It was common ground that it is difficult to obtain DNA from bones. In time DNA will degrade in bones and disappear. Two issues are important: the first is, was there an opportunity for contamination of the bones by the hair brush and curling wands (other evidence found at the site and collected along with the bones) such that the DNA from one might be transferred to the other? Such an opportunity would arise if either (A): they had come into contact or (B): both were handled at the same time without precautions such that there was transference from one to the other. So that is the first issue of contamination.
>
> Secondly, are you satisfied beyond reasonable doubt that the Crown has demonstrated that the results obtained in the U.S.A., that is the profile exhibit

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[51] That in the course of transporting the bone fragments from Melbourne to Adelaide and then back Melbourne again(capital cities in adjoining states of Australia) and then overseas, there was an opportunity for them to be contaminated with the victim's hairbrush or in the laboratory by some other means.

[52] Questioning the biological parents of the victim - and thus, suggesting that the probability calculations were invalid if premised on an erroneous assumption concerning paternity. There was some uncertainty as to who was the biological father of the victim.

[53] That once a mutation level in a particular referent population exceeds a certain point, it is impermissible to include that loci in the DNA profile (or at least, the NATA guidelines preclude that), and thus, challenging the ultimate calculation of the likelihood ratio. The removal of once crucial loci from the profile significantly reduces its predictive accuracy.

[54] Summing Up: 14.10.02 at pp.203-206.

> AC, comes from the bone and from no other source? That is, not from a contaminant.[55]

With other important matters for the jury, such as the calculation of statistics, the likelihood ratio[56], and the referential database used[57] – the judge discussed the various viewpoints of the experts at length, in detail, with great care, and substantial elucidation.

What did the trial 'players' think of the evidence?

Commencing with juror opinion and broadening out to the views of advocates and judges, participant observations of the players most influential over trial decision-making might be anticipated to disclose the links between forensic evidence, complexity and comprehension if our assumptions about the importance of relationships of influence holds. In addition to complexity, these observations may also identify other important matters influencing comprehension (and evidentiary weight) such as influential preconceptions. Court observations by the research team added a second level of perspective, removed from the interests of the case, and thereby providing a small control, and comparative potential.

Forensic Evidence

All but one jurors who responded, agreed that the forensic evidence (samples) was taken for the purpose of identifying the victim. Again, 7 out of the 8 who responded rated the importance of the forensic evidence for their deliberations at the highest end of the scale provided and only one juror rated its importance at the lower end. Half of the juror respondents indicated that the DNA evidence in the trial was made more important by being connected with other types of forensic evidence.[58]

Of the 7 jurors who responded to whether it would have helped their understanding of the case to have more forensic evidence put to them, 6 did not require this. As to whether it would have helped their understanding if there had been more information about the forensic evidence they received, one answered "yes", 2 were "unsure" and the majority responded again, in the negative.

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[55] Summing Up: 14.10.02 at pp.206-210.

[56] There are several ways of explaining this but most simply it is the statistical representation (ratio to a wider population) of the likelihood that the person sampled was not the person in question (victim or perpetrator depending on the purpose of the DNA analysis).

[57] DNA profiles are compared against a 'library' of profiles which make up a population of a particular type. The greater and more heterogeneous that population, the more convincing will be a match and its likelihood ratio.

[58] This was the only trial where we had a non-.response rate across all questions (up to5). Four jurors refused to participate in the survey. We observed a sometimes-tense interaction between jurors in the trial and at stages between jurors and the judge. It was also a long trial and this tends to impact on response rates in post-verdict surveys.

Consent to Sampling[59]

The juror responses were divided on whether the importance of consent in the taking of DNA samples was explained to them. Even so, consent was obviously not at issue in this trial because the identification was from the bones of the deceased against the samples of willing parents.

Sample 'Match'

Regarding the process of comparing DNA profiles to see if there was a "match", 7 of the 8 jurors indicated that this process had been explained to them over the course of the trial. One juror answered "unsure" to this question.

Court observations conducted at the time of the trial confirmed that several experts explained this process. All jurors who responded agreed that they understood what it means to say that a 'match' has been found between two DNA profiles. Indeed, such an understanding was crucial to the outcome of this case.

Expansion of Testing Power

It was assumed in the juror survey that if DNA evidence was considered by jurors to be significantly probative, then they would be well disposed to any increase in testing powers in the future. Even where they may have been frustrated by insufficient forensic evidence in their case, a confidence in its value should endorse an expansion in sampling practice.[60] A clear majority of the juror respondents here recommended an expansion of powers to require DNA sampling of suspects/prisoners. This is consistent with the results of all juries surveyed, and is significant in raising an issue that was not directly relevant to the trial itself or the jury's role within it. For Instance, the DNA evidence presented in trial A was for the purpose of identifying the victim alone. Put simply, any expansion of the power to require DNA sampling of suspects/prisoners would not conceivably, on the facts presented, have had any bearing on this case.

Pre-trial Awareness of DNA

A small majority of respondents indicated that they had been aware of DNA evidence prior to this trial[61] while 3 jurors said they had not been so informed. Again, as with most other trials surveyed, the majority of participants rated their probative expectations of DNA evidence in determining the guilt or innocence of an accused in the mid to high range of the scale provided. All of those who declared a pre-trial awareness of DNA profiling evidence also registered the highest expectations for DNA evidence in determining the guilt or innocence of an accused. Further, these high expectations were confirmed by their experience of DNA evidence in the trial at hand.

Of the 2 jurors who rated their expectations in the middle range of the scale, one answered "not applicable" to the question "was this impression confirmed by your

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59 As mentioned previously, in this matter a DNA sample was not taken from the accused. The DNA analysis involved the extraction of DNA from human remains and samples of blood taken from the parents of the victim to establish the identity of the remains.

60 We did not anticipate a level of sophistication amongst juror responses who might oppose more powers because they believed that the prevailing legislation was adequate if under-employed.

61 The question did not interrogate the nature, extent or source of this awareness.

experience of DNA evidence in this trial". The other answered "no" adding the words "it was extremely important".

Expert Evidence

The presence of expert commentary on the DNA identification evidence was assumed in the survey to have an influence on both complexity and comprehension. On the surface, it would be fair to expect that an expert, well led in examination, would clarify the issues and as such make them easier to understand. However, cross-examination is usually designed to challenge or impugn the expert's credibility and explanation. As such, a simple positive correlation between expert commentary and comprehension might not safely be draw. Also, if the other side introduced their own expert with a conflicting explanation, this would be likely to complicate and confuse the jury regarding the weight they should give to the initial expert delivery.

Jurors tend to expect that science and scientists are incontrovertible. Where confusion of contradiction surrounds expert evidence at trial it may have a disproportionate impact on the comprehension and certainty of jurors when compared with other confused or contradictory witness testimony.

In this trial, 5 experts provided evidence for the prosecution on DNA. Unlike the other cases surveyed, the defence also had an expert to challenge the significance of the DNA evidence.[62] Most jurors indicated that the forensic experts cooperated with the lawyers when they were questioned about the forensic evidence.

Prosecution Expert Witnesses

Dr A gave evidence on sample contamination. Although a witness for the prosecution, his evidence was inadvertently useful to the defence as Dr A was unable to extract any distinct DNA results from the bones because of the degraded condition of the fragments. Again to the advantage of the accused, Dr A observed that the reaction she obtained in her analysis of the sample was the consequence of contamination.

Ms S gave evidence via video-link up from the United States.[63] The prosecution relied on the expertise of the Armed Forces DNA Laboratory where she worked in analysing bone samples recovered from environmentally hostile conditions (e.g., mass disasters, etc). Ms S performed decontamination and extraction procedures on the bone fragments to obtain the samples that would be the subject of analysis. Her analysis itself involved mitochondrial DNA, that is, the DNA around the cell. She concluded, as a result, that the sequences of the two bones matched one another (in that they had the same genetic profile) and further, that the sequences matched the victim's mother's blood sample.[64]

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[62] Focus groups elaborated on the difficulties for the defence in securing their own experts, and the limitations on defence access to sample material for that purpose.

[63] It is worth noting that some delays were experienced due to the technology involved. In addition, the DPP instructing solicitor mentioned the significant expense involved in organising witnesses from overseas to give evidence.

[64] Mitochondrial DNA is only concerned with the maternal relationship - that is, there is no paternal relevance in this kind of analysis.

Ms L also presented evidence via video-link up from the United States. She performed a nuclear analysis of the DNA extracted by Ms S. She concluded that the bone fragments belonged to a female. In addition, she found that they shared the same profile and that this was consistent with that of the offspring of the two blood samples provided by the victim's parents. Finally, Ms L asserted that there had been no evidence of any contamination.

Mr G (a well employed local expert) was called to explain population databases and mutation rates. The likelihood ratio, according to Mr G's evidence, revealed that it was six hundred thousand times more likely to find that profile if it came from a child of the victim's parents than if it was merely coincidence and it came from a random matching in the population.

All in all, this array of expert testimony was clearly presented and largely without expansive contradiction.

Defence Expert Testimony

Somewhat impugning their understanding of all the expert evidence, the jury was evenly divided as to whether the defence presented any forensic evidence of its own (as in fact they did). One interpretation of this result is that the jury was unclear about the nature and purpose of the evidence presented by the defence. Of those jurors who answered "yes", all indicated that this evidence did not outweigh the importance of the similar prosecution evidence. One would think the resultant conviction would require at least this.

The defence expert was one of the few experts in the jurisdiction who provides expert testimony on forensic science for the accused. The general limitation on defence access to expert testimony obviously has bearing on the proof process and the adversarial contest particularly in trials where DNA is highly probative evidence for the prosecution, and open to alternative interpretation. Reasons for the imbalanced access to expert testimony across the trial were explained by trial advocates. Several responses taken from the Defender's surveys and focus group sessions, are revealing:

Question: *Besides the availability of suitable expert opinion, comment on any problems associated with the presentation of expert evidence on DNA:*

- "One major issue is the control of the database. While control is in the hands of police, they can do what they like. Independence is required. Access to the data is another important issue. Also, the criteria of a match varies around the world. There is a need to fix up the definition of 'a match'[65]

- "Need to use overseas experts re: mixture analysis due to lack of suitable experts in AU - money and coordination problems".

[65] Focus Group 2: 31.10.02, B McD, DNA Specialist

Question *If you have challenged DNA evidence did you receive adequate cooperation (when required) from the experts involved in the analysis, recording, reporting, matching and storage of DNA evidence?*

- "just subpoenaed all documents - essential".

- "but it came very late in the day - it was always slow and something the Crown washes their hands on the provision of all material".

- "Money and expertise problems mean that very often defence lawyers are at a disadvantage. Prosecution DNA experts should be giving more info, not less, as a matter of course. FSS (the Forensic Science Service) in UK provides useful model for independent body available to all sides for a fee".

Regarding independent analysis of the sample material and its importance for the defence case in particular, these comments came from focus group discussions on the matter:

- "...whichever lab does the testing for Police, you can't get away from the fact that that is the main client, accounting for 90% of client work".

- "that is just the nature of expert evidence (all have their camps)".

How do *context* and *impression* ground the complexity-confusion nexus?

Both simplified and scientifically detailed explanatory materials were provided for the jury in this trial to assist their comprehension of, at times, highly technical scientific information. The jurors' confident understanding of forensic evidence indicated here may be attributed to factors such as relatively lengthy trial duration as well as the participation of many experts[66] and the provision of explanatory material. Also, the careful and recurrent judicial instruction regarding the significance of the evidence was helpful to some jurors.

There seems little doubt here that if experts cooperate with advocates leading evidence, and DNA evidence is detailed and expansive it is likely to have a major influence on the jury's fact finding and comprehension. Contrary to the contemporary critique of juror comprehension and complexity[67], this trial evidenced a positive correlation between juror understanding and the scope, standardization and detail of expert evidence made available by the prosecution. This was not substantially influenced by defence challenge or the introduction of conflicting expert interpretation. Further, there was evidence here that jurors did not simply align prosecution expert evidence with the proof of the Crown case and as such cast doubt upon it as a consequence of defence challenge.

[66] Despite some disagreements over detail the majority of expert testimony confirmed the prosecution's claims for the forensic material.

[67] Discussed in detail in the papers contained in Findlay and Duff, 1988.

Trial B:

The context in which evidence was produced

Unlike the preceding trial, this case depended on DNA evidence to place the accused at the crime scene. Without DNA identification the other circumstantial indicators would not have been sufficient to found the prosecution case.

Charges

An important aspect of the prosecution's case here was linking the accused to the commission of the offences charged. Several robberies had been committed and material evidence removed from the crime scene was tested for DNA traces. In relation to robbery counts 1-3, the DNA samples were obtained from clothing left at or near the crime scenes.

- Counts 1 and 2 - the prosecution alleged that the accused lost a baseball cap as he fled the scene; and
- Count 3 - police recovered a black balaclava near the scene, which was said also to belong to the accused[68].

Surveillance of the accused had been conducted by the police as part of their investigation. They observed him flick a cigarette butt onto the street. Police recovered the butt and submitted it to the laboratories for analysis. The investigating officer in charge informed the Director of Public Prosecutions (DPP) solicitor that the DNA profile extracted from the cigarette butt "matched" the DNA extracted from the clothing obtained at the crime scenes. A decision was then made to arrest and charge the accused.[69]

Following his arrest, forensic procedures were carried out on the accused pursuant to the *Crimes (Forensic Procedures) Act* (NSW). Two analyst's reports stated that the DNA derived from the accused's hair sample was found to "match" the major component of the DNA recovered from both the baseball cap (counts 1 and 2) and the balaclava (count 3).

Circumstantial Case

Without the inclusion of forensic evidence of the kind referred to above, the police and in turn, the prosecution would have faced considerable difficulties placing the accused at the crime scene. The importance of the forensic evidence in this case is demonstrated by the weight attributed to it in the deliberations of the jurors, which was significant.

The nature of the case was complicated by the manner in which the DNA samples had been obtained. The defence argued that the DNA from the cigarette butt in particular was taken without legislative authority.

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[68] These were examples of DNA sampling outside the consent provisions generally required by the legislation

[69] This form of non-consensual sampling is not contemplated as orthodox for police investigation set out in enabling legislation; *Crimes (Forensic Procedures) Act 2000* (NSW). It is more than crime scene sampling in that the cigarette butt was used as a known identifier.

Defence Case

Regarding the crucial DNA evidence the defence had three not mutually exclusive options to argue:

- To challenge the 'science' of the DNA testing and the integrity of the analysis carried out in this case;
- To challenge the admissibility of the evidence from which DNA samples were taken on the basis of an absence of consent; and
- To impugn the remaining slender material circumstantial evidence.

Unlike trial A, this case turned on the capacity of the defence to challenge the forensic evidence as to its legality. If the samples were struck out then the case would fall. Similar to the trial A factual setting, the prosecution case was essentially reliant on the jury accepting that the admissible forensic evidence sufficiently linked the accused to the crime.

What did the trial 'players' think of the evidence?

The opinions of jurors in this case were of particular interest in that jurors were confronted with vital DNA evidence where the consent of the accused was either absent or in contest. Therefore, even though the admissibility issue would have been settled without the presence of the jury, it would have been apparent to jurors that crime scene samples were taken without the knowledge of the accused. The probity of police conduct and the integrity of the evidence along with the conclusions to be drawn from it were both at issue.

Forensic Evidence

All of the jurors interviewed indicated "hair" and "skin" (cells or otherwise) as the forensic evidence put to them during the trial. Most agreed that the reason for taking the forensic evidence was to identify the suspect and a smaller majority provided the additional reason of showing that the person was at the crime scene. All of the jurors rated the importance of the forensic evidence in the deliberations of the jury in the mid to high end of the scale provided. Half the survey participants chose the highest scale and a further five, chose the second highest.

Concerning whether it would have helped the jurors' understanding of the case to have more forensic evidence put to them, a clear majority responded positively. As to whether it would have assisted their understanding of the case if there had been more information about the forensic evidence they received, half of jurors agreed, three were "unsure", only two said "no" and one juror did not respond.

Consent

The jury appeared evenly divided on whether or not the importance of consent in the taking of samples was explained in the trial. The result indicates some confusion amongst the jurors about such a central defence issue. This confusion would logically have a bearing on the attitude to the propriety of evidence accumulation (if as it was, tested before the jury) and as such its significance for the defence case. In light of the verdict this did not appear to be the case.

A 'match'

All but one juror responded positively to the question whether the process of comparing DNA profiles to see if there was a 'match' had been explained to them during the trial. Again, with one exception, all jurors agreed that they understood what it means to say that a 'match' was found between two DNA profiles. It has often been argued that the science and significance of DNA profile matching is the kernel of complexity with this forensic evidence. Uniformly, however, our jurors in each trial expressed confidence in their understanding of the science and its ramifications, despite differing degrees of factual and analytical complexity case to case.

Expansion of Powers

All jurors supported an expansion of powers to require DNA sampling of suspects/prisoners. Again, this result demonstrates the very compelling nature of DNA evidence from the juror's point of view.

Pre-trial Awareness

Most jurors admitted they were aware of DNA profiling evidence before their participation in this trial. Only one juror indicated no prior knowledge and another two indicated that they were "unsure". In rating how important they expected DNA evidence to be for determining the guilt or innocence of an accused, all responses fell within the mid to high range of the scale provided. On whether the anticipation formed and indicated about the significance of DNA prior to trial, was confirmed by their experience of the DNA evidence at trial, the majority were overwhelming impressed.

Expert Evidence

Jurors observed that an expert was presented by the prosecution to explain the significance of the forensic evidence. Only one did not recall this and another was "unsure". In contrast, all jurors said that the defence did not lead an expert to challenge the significance of the DNA evidence. Again, all jurors agreed that the prosecution expert cooperated with the lawyers when questioned about the forensic evidence. This non-combatant atmosphere in the witness box tended in our observations to suit the apparent attentiveness of jurors.

Defence

All jurors agreed the defence did not present any forensic evidence of its own. The principal issue for the defence was the admissibility of what were argued to be samples outside the sanction of the legislation. As such the defence was not so much contesting the accuracy of the profile match, but rather the probity of the sampling and its availability as evidence at trial. It is worth noting, as this trial confirms, the discretion of the judge under the legislation to admit improperly obtained evidence depending on its probative weight. So even if the defence were able to establish improper practice in the collecting of crucial samples, the contested evidence can still end up before a jury for consideration.

Given the problematic circumstances in which the police were able to recover the "matching" DNA evidence in this case, particularly from the discarded cigarette, it is relevant to consider responses from the defender's survey concerning the admissibility of such evidence, and the problems it may pose:

In your experience what provisions of the legislation (if any) and their operation create problems regarding the admissibility of forensic evidence under the Act and why?

> "There appears insufficient understanding by scientists re: analysis of results, leads to exaggerated claims for matches".
>
> "Concerned suspects who are Aboriginal, the protections are not stringent enough. Often the "interview friends" present understand little about the procedure and feel compelled to offer no resistance".
>
> "The whole question of consent is undermined".

These issues resurfaced in the lawyers focus group:

> "In relation to the example of a cup being left in the interview room and then being tested for DNA, in a recent trial, the police had the accused as a suspect under surveillance. The Officer in Charge (OIC) gave evidence on the voir dire (trial of evidence admissibility) of knowledge of the Act, but then there was a sample of a discarded cigarette butt. It was held that the picking up of the butt was not 'taking' for the purposes of the Act – a forensic procedure was not 'carried out on a person'."
>
> "Concern with ability of Police to get around the Act; and with risk of contamination".
>
> "Police pick up samples when they don't have enough to get an order".

How do *context* and *impression* ground the complexity-confusion nexus?

Again, the issue for jurors in this trial was the extent to which juror comprehension was mediated by complex forensic evidence and the factors which would militate or exacerbate that capacity.

Forensic evidence

The survey results from this trial are distinguishable in a number of respects from other trials observed. For example, in contrast to the responses from other jurors, the jury in this case overwhelmingly supported more forensic evidence being put to them in order that their comprehension could have been enhanced.[70] Similarly, in response to whether more information about the forensic evidence they received would have helped their understanding, only two indicated "no". This suggests that the jury saw the volume and detail of forensic evidence in the prosecution case needing elaboration, and perhaps the explanations provided, as not satisfactory. Even so, a guilty verdict accompanied this dissatisfaction with the forensic evidence. There seems at this level of comprehension to have been no necessary correlation between the context of inadequate understanding and trial outcome.

The jury in this matter rated the importance of the forensic evidence at the mid to highest end of the scale. Specifically, eleven jurors responded in the top two tiers of the rankings provided. Along with, and in contrast to the responses of other survey

[70] In the other two case-studies presented in this paper, the jurors were evenly divided on the issue.

participants, this indicated that the consideration of DNA evidence in the deliberation process was largely context driven. The trial transcript and observations indicated that the DNA evidence and its cogency should be crucial to establishing the prosecution case. From this it can be concluded that where say DNA is crucial for the identification of the accused, and this is the cornerstone of the charge, then its relevance is highly rated by jurors. In situations such as this case, where DNA had this significance, jurors still seek additional evidence or further elaboration to make satisfactory their eventual verdict.

Expansion of powers

Here, the unanimous response of the jurors to expanding sampling opportunities and powers is consistent with the responses of the clear majority of all survey participants. In other trials, this was not always supported by the probative expectations for DNA. In this case, on the other-hand, DNA linked the accused to the crime above all other circumstantial evidence. Therefore, if the prosecution conclusions on the evidence were accepted by the jury as they seemed to be here, then the importance of DNA is confirmed, despite the desire for more such evidence.

Despite their circumspection regarding the defence attack on the forensic evidence, and conceding the need for more prosecution-directed forensic evidence, juror deliberations confirmed DNA as conclusive for identification, and hence the proof of the prosecution case. All this was despite the strong defence assertion that the DNA sample had been improperly procured. The probative weight of the evidence was apparently accepted by the jury as more important than challenges to the propriety of investigation procedures.

Tough Case for the Defence

DNA samples as the foundation for evidentiary conclusions in this jurisdiction remain largely the province of the prosecutor. Put against the significance accorded this evidence by jurors in this case, even where its objective relevance is conjectural, the defence is at a distinct disadvantage.[71]

Because of its contextual significance, more than with other pieces of circumstantial evidence, the responsibility rests on the accused to challenge the impact of DNA rather than to rely on the prosecution's inability to draw tenuous conclusions from its analysis. DNA as evidence is open to challenge at many levels, but opportunity for the defence to do this appears to be practically and vitally constrained.

With jurors placing heavy and perhaps disproportionate reliance on the probative value of DNA, the prosecution is at a unique advantage by means of its simple introduction. This advantage has pre-trial origins. Among those jurors who were aware of DNA profiling evidence before their participation in this trial, expectations of the evidence in determining the guilt or innocence of an accused were high - and these expectations were largely confirmed from their experience of the trial itself.

[71] This is more so if, as seems to be the trend in NSW, that the defence concedes the science of DNA testing and analysis. The more common defence attacks are on continuity and the validation of the stages of analysis.

Trial C:

The context in which evidence was produced

This case combined detailed forensic evidence from the prosecution designed to identify the accused as present at the scene of the crime, with conclusions that he was the most likely perpetrator. DNA was just another element in the circumstantial case, but the prosecutor admitted that he would have been reluctant to take the matter to trial without it. The defence originally challenged the science and integrity of the DNA evidence, but at trial chose to employ it as a way of advancing the presence of a third party at the crime scene. Identification of the accused as perpetrator was proposed by the prosecutor through the DNA sample, while the defence employed the mixed sample to introduce the 'stranger' perpetrator explanation.

Facts

The accused was charged with having murdered his onetime girlfriend. The victim's body was found lying face down on her bed with her hands tied behind her back and a cord around her neck. Marks on the victim's ankles indicated that her feet had also been tied. A cord that was lying beside the bed was tested for DNA and a mixture of profiles that did not exclude the accused were found, along with that of the victim. Therefore, the jury was asked to consider the profile significance of a sample said to match that of the accused, that of the victim and that of another potential incriminee.

Explanatory Material

The defence acquiesced to the prosecution tendering an explanatory document for the jury that became known as exhibit "O".[72] This had been prepared by an expert witness for the prosecution. The document was observed by the research team being positively used and generally referred to by all courtroom participants during the hearing. Only in one other trial in the survey was mutually accepted material on DNA science presented to the jury.[73] This was also a trial where juror's rated their forensic comprehension as high. Exhibit "O" was the most comprehensive *plain language* document disseminated to a jury in the trials observed. The judge introduced the exhibit in the following manner:

> Ladies and gentlemen, this is material of some technical complexity. It consists of a number of sheets which will have to be explained to you and explained in terms of the scientific significance of whatever it is we come to talk about at each point.
>
> The parties are to be commended for permitting the Crown to tender the evidence in this way. That permission to it being tendered to you in this form is not a concession that it's accurate; it is, however, a concession that it's an appropriate way for the Crown to put its evidence in front of you so that you can understand it. It is designed to make things easier for you to appreciate what we are talking about.[74]

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[72] Contrast the view of a senior public prosecutor very familiar with DNA evidence in trials, that a common defence strategy is to confuse the jury with science and technicalities. (Interview with GT).

[73] See Trial A.

[74] Day 10, 3 September 2002, at pp.608. This document was set out to describe such issues as:
DNA = deoxyribonucleic acid [building blocks for life]

The defence did not take the view here that a confused jury is more likely to acquit.[75] Indeed they conceded that comprehension is a responsibility for both sides in the case.

Circumstantial Case

The Crown case was circumstantial. Apart from the DNA evidence, the other evidence included:

- a false alibi for the night of the murder;
- other lies concerning the accused's whereabouts that evening;
- the accused's shoes were missing on the night in question;
- after the murder he was seen with cash that he had not had previously;
- injuries to the accused hands were observed;
- an apparently blood stained shirt was seen hanging on the clothes line at his place of residence the next day; and
- the accused's jacket was found soaking in the laundry tub at that time.

The Crown Prosecutor described the nature of the case in the following way:

> The Crown relies upon the united force of a number of circumstances to establish the guilt of the accused and in relation to those circumstances, the Crown asserts that there is no other reasonable explanation of the evidence.[76]

Indeed, the prosecutor at the trial admitted to researchers that the Crown would not have been in a position to prosecute the accused at all if the DNA evidence, the crucial circumstance as he saw it, had been excluded.

Prosecution Case

The Crown Prosecutor referred to the DNA evidence in his opening as one of the circumstances that comprise the Crown case.

> You'll hear some evidence from experts regarding DNA ... Now the testing of the cord showed a mixture of DNA profiles from male and female origins and was indicative of two contributors to the major components.
>
> Now, one thing that the DNA evidence establishes is that another lover of (the victim) ... was excluded as a major contributor, the accused is not excluded and (the victim) is not even excluded.
>
> Now statistics have been worked out. Now before I give them to you, I should say this to you; it's not really a mathematical process at all, you don't get over-

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DNA is contained within chromosomes [chart]
What is DNA? [plain language explanation]
What is a locus? [plain language explanation]
What is an allele? [plain language explanation]
What is a DNA Profile? [plain language explanation]
Possible ways of matching a DNA profile through identity, coincidence and likelihood.
Identity: if the DNA originated from the persons under question;

[75] Indeed this is not supported by empirical evidence – see, Findlay, 1994.

[76] Crown Opening, 20 August 2002.

> awed by raw numbers, it's simply a factor, the circumstances of the DNA into the equation, into the altogether evidence and you see where the evidence points at the end of the day.
>
> Now I said the stats had been worked out on the basis of two major contributors, comparing the probability of obtaining a mixed profile, if, and I emphasise 'if' it came from the accused and (the victim) being his girlfriend at the time, to the probability of obtaining the mixed profile, if it came from two persons selected at random.[77]

The Crown closed on the strength of the DNA evidence. After going through much of the evidence in the context of a circumstantial case, the Crown prosecutor made the following remarks:

> The DNA in fact is a very important part of this case. Obviously it is and you need to consider it and consider it in some detail and you need to consider this suggestion that this cord could have been inadvertently left there, a tracksuit cord with a stain on it. Members of the jury, that's not a reasonable possibility.

Defence

The defence originally made an (unsuccessful) application to have the DNA expert evidence excluded.[78] The judge ruled against this objection on the basis that DNA analysis is a process of fact. Every scientist to some degree or another is subjectively involved in reaching a judgmental conclusion about such facts and therefore the DNA evidence was more than mere opinion.

Given its inclusion, the defence approached the DNA evidence from a number of the different angles: firstly, dealing with the veracity of the evidence and secondly, its interpretation. This is clearly demonstrated in defence counsel's opening:

> The Crown expects expert scientific evidence to satisfy you that the DNA of the accused and his girlfriend, was in a stain on one of the pieces of rope that the murderer used to tie up (the victim). We will be asking you to look hard at that evidence. Indeed, we expect that you will understand by the end of the case that it's not the usual sort of DNA evidence at all. Indeed, you will hear that it is evidence of a mixture of a number of people's DNA and that the state of the science is such that mixtures are actually quite hard to interpret and opinions as to what a DNA mixture shown in graphic form actually means can differ from expert to expert.
>
> ...If you're not satisfied that that (prosecution's) approach is acceptable, then the statistical figures that you will be hearing in the Crown case will, of course, be

[77] Crown Opening, 20 August 2002.

[78] The substance of their objection was that it is not open to give evidence, in a mixture DNA case, of the process for determining the major contributors' profiles by reason of that process, having a number of stages - each one of which, the analysing scientist must exercise their own subjective judgment. In sum, their conclusion would be so tainted with subjectivity as to no longer be opinion, or acceptable opinion evidence as set out in the legislation. See further, Day 10, 3 September 2002, at pp.606.

> worthless. In other words, at the end of the day we will be suggesting that you have no alternative but to put the Crown's DNA evidence to one side.
>
> ... Even if the Crown's DNA evidence was incontestable ... the fact that there was that mixture of DNA in a stain on the cord was in (the victim's) house doesn't prevent someone else from using it to help kill (the victim).[79]

The following points were the substance of defence counsel's closing address, that:

- if the cord found near the body of the victim carried the DNA stain of the accused, this does no more than show the murderer used a cord with such a stain (that is a pre-crime stain);
- if the cord found around the neck of the victim was in fact the boot lace of the accused, why was the DNA analysis on it inconclusive (there should have been a reportable result given the constant use);
- the likelihood ratio of the sample being that of the accused, was challenged based on the interpretive role of the experts conducting the analysis;
- identified problems with inconsistencies in the scientific interpretation of the DNA further confuse what can be drawn from the ratio; and
- the minor contributor to the mixed DNA sample, could not exclude presence of the other ex-lover.

The Judge

The judge in this case was often interventionist. The judge's concern to influence the impressions conveyed to the jury, was indicated through the direction given to the jury following the publication of a news article about the trial and its representation of DNA evidence:

> (*In the presence of the jury*)
> That article ... is a very good example of the sort, that while possibly well meaning, was wrong and wrong in a material way, such that you should have disregarded it, and that I now instruct you, again, you should disregard it.
> ....
> It is a very good example about why you need to keep open minds. That discussion of statistics, the Crown prosecutor mentioned which was reported but not accurately, or not precisely accurate was one in which you need to receive very careful assistance when the evidence is actually given, and in due course, if it is to have any use to you at all.
> ...
> But please, if you happened to see or hear of the publication, put it entirely out of your mind. If anything else should be published about this matter, please remember that it's what is given in court before you, the evidence to which you should have regard, and what legal instruction is given to you about it, not what might happen mistakenly to be published by the media.[80]

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[79] Defence Opening, 20 August 2002.
[80] Day 2.

Media Representation of the Trial

The journalist castigated by the judge for this misleading article, was present throughout most of the proceedings. The DNA evidence played a not insignificant part in her reporting of the case. Apparent bias was indicated in an article written on the Crown's opening address, entitled "*DNA 'links' nephew to cord that killed aunt*". The report covered many other aspects of the Prosecution's remarks. Regarding the DNA evidence, the article observed:

> ... Tests on DNA found on the cord used to tie up the victim had excluded the former murder suspect, (the victim's) ex-boyfriend, the prosecutor said. But the mixed DNA profiles had not excluded (the accused) and his then girlfriend (the victim).
>
> "Statistics have been worked out that it was 10 billion times more likely to find the mixed profiles if they came from the accused and (the victim) than if they came from two persons selected at random," (the prosecutor) said.
> ...
> He said mixed DNA samples were very hard to interpret and experts had differed in their opinions about the sample taken from the cord found on the victim.
>
> "If even the experts can't agree, then how could you, a jury, use that evidence as a basis for finding guilt beyond a reasonable doubt," (said defence counsel).[81]

This article formed the basis of an unsuccessful application by the defence, on the second day of the trial, to discharge the jury.

The DNA evidence was referred to again, albeit it briefly, in another article entitled *"Nephew's alibis and a parka in the tub - Court hears details of night aunt was killed":*

> Tests on DNA found on the cord used to tie up the victim had not excluded (the accused or the victim).[82]

And finally, the DNA evidence was the subject of an article itself under the title *"Murder cord DNA 'tied' to accused":*

> DNA found on a cord used to tie up murder victim was 10 billion time more likely to have come from (the accused) than from people chosen at random, a court heard yesterday.
>
> ...
> Justice (J) told the jury the likelihood ratio used sounded like a "very dramatic piece of evidence". But he urged the jury to keep an open mind on its significance.

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[81] Lorna Knowles, "DNA 'links' nephew to cord that killed aunt", *Daily Telegraph*, 21August 2002, p.9.
[82] Lorna Knowles, "Nephew's alibis and a parka in the tub - Court hears details of night aunt was killed", *Daily Telegraph*, 29 August 2002, p.24.

> "The likelihood ratio is properly a statistical phenomenon ... but it should not be thought to be an expression of fact, such as something which says for instance, 'it is the DNA of the accused and (his girlfriend) on the cord", Justice (J) said.[83]

After the accused was acquitted, the current affairs programme *60 Minutes* televised a story on the case entitled "Blind Justice". The story suggested, among other matters, that the accused had previously made certain adverse admissions to an undercover policeman prompted by the latter's claims that he could steal or otherwise taint the incriminating DNA evidence.

Expert Evidence

A forensic scientist (Mr G) and a forensic biologist (Ms B) from the state laboratory (the Division of Analytical Laboratories (DAL)) gave evidence for the prosecution. The defence did not present their own expert evidence, consistent with defence practice in each of the trials observed, with the exception of A (above).

Defence counsel in this trial made an application to have the evidence of (G) and (B) excluded. However, his Honour ruled against this objection and the scientific opinion evidence was held to be admissible. Once included, the defence conceded to the prosecution tendering explanatory material that had been prepared by (B), and referred to as exhibit O.

During the cross-examination of the experts, there was some suggestion of collusion between the two regarding their evidence.[84] Also criticising 'selective science', the defence identified other important 'crime sites' in the case where the results of any forensic analysis were not reported on by the experts, or even tested.[85]

Regarding Exhibit "O"[86], the specific charts depicted therein to describe the analysis and conclusions on the samples tested were interrogated by the defence in order to highlight that the sample mixture comprised three separate contributors. In this way, the interpretive role of the expert in analysing the results (and the inconsistencies therein) became the focus of defence contention.[87]

How do *context* and *impression* ground the complexity-confusion nexus?

The defence compounded the complexity and comprehension nexus by letting in uncontested the prosecution's explanation of the general DNA science and then challenged its application in this case, and the competence and conclusions of the expert witnesses. Finally, they advanced an interpretation of the mixed sample found on the cord which raised a doubt about whether another unidentified party could have been involved in the murder. Jurors confronted adverse interpretations of the science in this case, the analysis and the interpretation to the conclusions to be drawn.

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[83] Lorna Knowles, "Murder cord DNA 'tied' to accused", *Daily Telegraph*, 4 September 2002, p.17.
[84] Day 10, 3 September 2002, at pp.640-641.
[85] Ibid, at p.641.
[86] The agreed document referred to in n.47 above.
[87] See for example, pp.645; 652; 679.

Forensic Evidence

In the context of respective counsel's submissions, the forensic evidence was used to implicate the accused according to the Crown case, and to eliminate the accused according to the submissions of defence counsel. Regarding the importance for their deliberations which jurors attributed to the forensic evidence, most rated it in the mid-range of the scale provided. Four rated it in the second highest category. Another four rated it in the middle category and three others placed its importance in the second lowest category. This more conditional opinion of the DNA evidence than that expressed in the other two trials above is not a reflection of confusion over the evidence, which was well presented and clear. Rather, it should be read as a consequence of the doubts the defence were able to raise regarding its analysis and interpretation.

Another interpretation of the unusually dissatisfied jurors when it came to the DNA evidence 'on trial' may relate to what wasn't analysed. As is the case with juror's being excluded from arguments over admissibility, and their tendency to second guess what they are not allowed to hear, jurors are confused by what they believe to be crucial evidence which remains outside their consideration. The absence of information presented to the jury in relation to any DNA analysis conducted on the cord found around the victim's neck (rather than a cord that was found in the near vicinity of the body) was the subject of a question from the jury during the course of the trial - as set out below:

> Was any testing for DNA performed on the black cord (found around the victim's neck) or on the pen found entangled in her hair and the cord?
>
> If there was testing done, are the results of such testing available to the jury?[88]

In response to this question, the Crown was allowed to re-open its case and an agreed statement was read as follows:

> ... (B) has provided the police with a statement to the effect that she "tested the black cord and the pen and the tests were unsuccessful, due to insufficient DNA recovery".[89]

This did not seem to satisfy all the jury. A small majority of jurors agreed it would have helped their understanding of the case to have more forensic evidence put to them. One juror answered "unsure" and five indicated "no" in response to this question. In terms of whether it would have assisted their understanding of the case to have more information about the forensic evidence, four jurors answered "yes" another four were "unsure" and three responded in the negative.

The relatively wide distribution of responses to these questions may be contrasted with the juror responses in trial A. There too a large volume of DNA analysis was presented by the prosecution, but in that trial the level and nature of challenge by the defence was

[88] Day 12, 5 September 2002, at pp.702.
[89] Ibid, at pp.716.

less detailed and constant than was so in this case. In trial A there was strong support for the significance of DNA evidence but the majority of jurors did not want more in order to assist their deliberations. Logically in trials where DNA and other forensic evidence was prominent, detailed, and less strategically contested jurors did not seek to have more presented to them. Also, if all possible DNA analysis was before the jury then they tended to be more satisfied with forensic evidence.

Defence

The defence did not present any forensic evidence of its own - although, it did attack both the veracity and interpretation of the results of the DNA analysis conducted by the analytical laboratory. A result of the analysis before the jury indicated an unknown contributor to the mixture. This was consistent with the submissions of defence counsel that someone other than the accused committed the offence.

When asked whether the forensic evidence was attacked at any stage in the trial, seven jurors answered "yes" to this question and five "no". This mirrors the level of confusion among jurors whether the defence presented their own forensic evidence. The defence very clearly attacked the veracity of the DNA evidence, but not through contradictory expert opinion. Therefore, satisfaction with DNA evidence also would seem to depend on whether jurors were confused about its presentation and its integrity.

Defence lawyers consistently put the view to the research team that an important reason for not challenging with their own expert the sample and its science was their limited access both to the sample itself, and to available expert opinion. Against this it is interesting to consider the views of prosecutors who were interviewed about the problems of granting the defence access to crime scene samples for independent analysis:

> "There are no doubt procedural difficulties giving defence access to crime scene samples as it is often the case that whatever the sample is it is minute in quantity and all of it required for analyses. I also foresee refusing to give them access to samples as being an issue being raised in future hearings and trials, defence arguing the prejudice aspect that they are not entitled to obtain their own analysis. It would ultimately boil down to a question of fairness. The more serious the offence the more prejudice and may give rise to discretion sections being argued for exclusion of evidence".
>
> "As a matter of fairness (and to strengthen the prosecution case by showing we are not seeking to avoid independent analysis) the defendant must, in my view, have access to a sample for independent analysis. A simple analogy is blood samples taken at hospital in driving matters - in my experience, defendant's very rarely choose to have their sample independently analysed, but when they have some so the result either supports the prosecution analysis, or the discrepancy can be explained (by an expert) as being the result of different methodology/deterioration of sample through time/storage method/etc.

It would only be problematic if there were insufficient sample to allow for the provision of a separate sample to the defendant. Perhaps, if there was only enough for one analysis, the defendant could be offered the opportunity of having their own expert present to witness the testing of the sole sample by the prosecution. That way we would have protection against claims of faulty methodology.

"The sample should be analysed by a credible independent analysing agency, so it cannot be questioned even with another independent analysis".

These views should be contrasted with the Defender's survey results regarding the problems of limited access when preparing their case:

"Security issues re: integrity of sample - but could be done".

"Depends largely on Crown/Informant in any particular case as to whether and extent of problems faced".

"The crime scene material is always the last thing secured. The copies given to the defence are often of such poor quality that they are useless. We have difficulty getting convenient access to material**".**

The Accused

The majority of jurors agreed that there was only one accused tried in the case before them. One indicated that they were "unsure" and another indicated that there was more than one accused. This apparent ‘confusion’ must reflect the defence argument that someone other than the accused committed the offence, and its weight on the mind of some jurors. In fact the failure to clarify the mixed sample or to find DNA evidence on the murder cord may have been sufficient to raise a doubt reasonable for acquittal. Perhaps compounding this uncertainty was the presence in the public gallery of a person who had been charged previously with the offence.

On the issue of ‘several accused’, the question whether the forensic evidence assisted in distinguishing between the involvement of the different accused, five answered "no", two jurors answered "unsure" and one answered "yes".

Sample ‘Match'

The question about explaining the process of comparing DNA profiles to see if there was a 'match' produced the agreement of a clear majority of the jurors. One juror responded "unsure" and another did not answer. Whether they understood what it means to say that a 'match' was found between two DNA profiles, eleven jurors answered "yes" and one answered "no".

One needs to be cautious in drawing any correlation between understanding and verdict outcome. It might be fair to assume that if misunderstanding about a crucial piece of evidence leads to doubt then this should substantiate an acquittal, if as in NSW

unanimity is required for a jury verdict. Yet, as may have been the case in this trial, an understanding of the DNA evidence, its limitations or contrary interpretations may also draw the juror to prefer the defence version of the evidence, or at least doubt that the prosecution has established its case. Thus, an acquittal may arise from contrary understandings of DNA evidence, an much as it may out of confused understanding.

Expansion of Powers

A majority of the jurors supported an expansion of powers to require the DNA sampling of suspects/prisoners, based on jurors experience of this trial. Again, this result is consistent with all other jury survey responses collected over the course of the review. Three jurors indicated that they were "unsure". This was in the context of where a large amount of forensic/DNA evidence was already on the trial record. It might also reflect the frustration that what might have been viewed as important analysis had not been put before the jury, such as the DNA on the murder cord.

Expert Evidence

Regarding whether an expert was presented by the prosecution to explain the significance of the forensic evidence, the majority of jurors obviously answered "yes". Two selected "unsure" and one "no" to this question. The prosecution in fact presented two experts from the lab to explain the forensic evidence.

In response to the question whether the defence had an expert to challenge the significance of the DNA evidence, the majority of jurors answered "no". One answered "unsure" and three selected "yes". The defence did not have an expert challenge the significance of the DNA evidence.

Confusion over which experts represented what side of the case might be explained by the degree to which the defence and the prosecution conceded and agreed upon large amounts of expert testimony. It might also indicate that some jurors rightly perceived the expert testimony as being objectively directed towards the evidence rather than to one or other sides of the case. This is further confirmed by the majority of respondents who agreed that the experts cooperated with the lawyers in the presentation of their evidence.

Awareness and Satisfaction

As was the case in the other trials, jurors were aware of DNA profiling evidence before they came to the trial in question. In this trial it was a small majority so aware. Two answered "unsure" and three selected "no". In terms of how important they expected DNA evidence to influence the determination of an accused's guilt or innocence, the responses selected were within the mid to high end of the scale provided. Just under half of the jurors selected the highest category. On closer analysis, of those jurors who answered "unsure" to question of fore knowledge, one ranked their expectations in the highest category and another in the second lowest. Of those jurors who had prior knowledge of DNA, one rated its anticipated importance in the second lowest category, two rated it in the middle, another two in the second highest and finally, the remaining two in the highest category. Of those jurors who did not have fore knowledge, one rated

the expected importance of DNA in the middle category and another two in the highest category. This detail suggests no consistent correlation between pre-trial knowledge of DNA, and its anticipated significance for determining verdict. For instance, those jurors with high expectations for significance were not always those with any previous understanding or awareness of DNA evidence. It could be said therefore that in this case at least, the trial encounter with DNA evidence for some jurors was as important in formulating impressions of significance as may be pre-trial awareness.

On whether this impression was confirmed by their experience of DNA evidence in this trial, the jury was divided (five jurors selected "yes", another five selected "no" and the remaining two indicated "unsure" in their survey responses). Significantly, of those that rated their expectations of the evidence in the highest category, over half selected "no" to this question. Similarly with the theme of expectations for evidence, these results indicate that the high expectations of the jurors concerning the significance of DNA were more frequently not met as a result of the experience of the trial. This again may importantly explain the acquittal.

Conclusion - What then about a jury's reception of DNA evidence could be said to influence verdict?

Awareness and Satisfaction?

Trial C was the only one of the three to result in an acquittal. Juror equivocality about forensic evidence, as it would be with any other evidence, should feature in the jury arriving at this verdict. There was less consistent awareness, anticipation and satisfaction concerning the DNA evidence in this trial than for the juries in A and B.

The pre-awareness and confirmation themes may therefore distinguish the satisfaction and comprehension features of a juror's reception of DNA rather than other evidence. If we compare trial A with trial C, both had extensive presentations on DNA evidence in which techniques to support juror comprehension were employed. Both relied on several prosecution experts to discourse on the meaning and significance of DNA sampling. In both trials the jurors were confident in their understanding of the science. Where the trials departed was over the:

- nature, focus and style of the defence challenge to the expert analysis,
- degree of juror fore knowledge of DNA and their expectations about its significance'
- extent to which the trial experience confirmed their expectations that forensic evidence was significant
- the consistency of the challenge to the credibility of expert opinion, and
- the application of DNA samples to support both the prosecution and the defence interpretation of identity and presence.

The trials produced different verdicts. If we accept that DNA evidence was perceived as significant by many jurors in both trials, then its significance might have tended to deny as much as confirm the prosecution case. In considering anticipation and confirmation of significance it would be fair to assume that if these were both consistently expressed as high then they would advantage the case advancing the DNA evidence. What is suggestive, however, is the relationship between a high degree of pre-trial familiarity

with DNA evidence, (even at the level of popular culture) and a reduction in doubt. However, this may not be so if the opposing side has a cogent and contrary interpretation of the evidence. Further, one should not simply assume that if there is consistency between anticipated significance and confirmation through trial experience that will always advantage the argument relying most heavily on DNA evidence, although this seemed so in trials A and B. In C there was no such consistent pattern.

Challenging the DNA evidence?

The fact that the defence challenged DNA in a trial where a conviction resulted (such as in A) may not be crucial to the verdict. It is obviously the nature of that challenge which is central to its impact. In trial A the challenge was directed towards the integrity of the analysis, which some of the Crown witnesses conceded was at issue. In B the challenge was to the probity of sample collection and, therefore, its admissibility. It would be fair to assume that as both these trials resulted in convictions, that jurors were willing to overlook some flaws in the analysis and some questions surrounding the police actions in collecting samples, and prefer to be influenced by the probative significance of the forensic evidence in any case.

Challenges to the credibility of prosecution expert witnesses may have more potential to create doubt in the mind of the juror. This type of challenge was more apparent and sustained in trial C, at times amounting to suggestions of collusion between the analysts.

The experience in trial C confirms that the strength of the defence challenge may also depend on the cogency and grounding of an alternative explanation or conclusion drawn from the DNA. If the forensic evidence is used to cast doubt in a similar fashion that it is relied upon to identify the accused and place him at the trial then the influence is telling.

Our observations of trial C raise a note of caution for prosecutors in their growing obsession with forensic evidence. Prosecutors here confided in the research team that they may not have proceeded with the case against the accused without the DNA sample on the cord. Yet in this trial DNA had a sting in the tail. Where DNA is unable to exclude other explanations, and bearing in mind its sometimes disproportionate probative influence in the mind of jurors, DNA can as easily fortify reasonable doubt as dispel it in greater measure for a receptive and well instructed jury.

Comprehension and Complexity?

Our observations do not support a simple or unequivocal correlation between complex scientific evidence and reduced juror comprehension. While there is indication in juror responses of selective confusion about the nature and contribution of DNA evidence, generally where it was particularly and consensually described, jurors made a fair fist of understanding its relevance. Comprehension appeared more depended on contested rather than complex evidence.

More important for comprehension and deliberations on complex evidence, however, is the emergence of a simple truth in circumstantial cases which the mystique of forensic evidence, and DNA sampling in particular, cannot over-ride. In trial C there was a

credible alternative explanation to the accused's liability advanced by the defence, and the jury appear to have found this persuasive. In fact, the DNA mixed sample did not exclude the alternative inference as much as it could have endorsed the prosecution interpretation on identity.

It is accepted by trial professionals (lawyers and expert witnesses alike) that the science of DNA profiling, and the explanation of profile matching in particular, are complex issues of evidence. Throughout our juror responses there was a consistently expressed confidence in comprehending these complexities. More detailed interrogation of associated issues such as consent, and the place of the evidence within the circumstantial case tended to endorse this opinion regarding comprehension.[90]

In the oft-assumed complexity/comprehension nexus, or evidence that jurors felt they understood DNA sample evidence should not simply be taken as denying the relationship of complexity over comprehension. Accepting trial context, and differing situational influences over understanding as relevant to complexity and comprehension, these differences should suggest other important considerations for comprehension in particular:

- in each of the three trials detailed above, DNA identification played different roles in the circumstantial case;
- as such the evidence in each case may have held different legal/probative value;
- the lawyers and the expert witnesses gave different presentations of the evidence in question;
- the evidence was relied upon to prove different things;
- the evidence may or may not have been challenged;
- the expert may have been challenged in different ways and to differing degrees;
- differing interpretations may have been advanced for the evidence; and
- the judge in each case tended to give consistent directions to the juries that DNA evidence should be accorded no more significance than other circumstantial evidence.

Uniformly, this direction seemed to be discounted. The general pre-trial appreciation of DNA forensic evidence admitted by jurors and its interpreted significance are likely explanations. This appreciation, constructed as it was in a 'popular culture' context pre-trial[91], appears also to have made jurors receptive to comprehending DNA evidence as a consequence of its perceived and anticipated significance. This leaves the speculation that the complexity/comprehension nexus is diminished when:

- the evidence in question is known to juror's pre-trial and anticipated to be significant; and as a consequence
- juror's are well disposed to this evidence and want to comprehend its complexity.

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[90] This is not to discount the occasional example of misunderstanding which seemed to have little or no effect on eventual verdict despite the confusion. In a jurisdiction which requires a unanimous verdict this might only logically be explained by the juror concerned not holding that any such misunderstanding as sufficient to challenge 'beyond reasonable doubt'.

[91] The entertainment genre is the location of this 'popular culture' and very often represents DNA evidence as the irrefutable element in the case.

What we can say with some certainty is that juror comprehension of DNA evidence is not dependent on its complexity alone. If the evidence is presented clearly, the expert testimony is consistent and largely not impugned, the defence do not present contrary interpretations of the DNA evidence, and the case is otherwise circumstantial, then jurors seem to manage the science and weight it significantly. Jurors are largely well disposed to DNA evidence and suspicious of its crucial absence. The challenge for the defence, therefore, where the playing field of sampling and access is far from level, will be to either discredit the expert, or to employ DNA to justify a reasonable doubt.

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