

Investigative Psychology and Law: Towards Collaboration by Focusing on Evidence and Inferential Reasoning

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Abstract

Introducing a special issue of this journal, Youngs discussed the desirability of, but problems in realising, greater collaboration between psychology and the criminal investigation and trial processes. This paper acknowledges the value of investigative psychology's potential contribution but argues that the alleged incompatibilities, between psychology and law, are based upon too narrow a conception of law and legal action. A direct approach, with considerable potential for productive, principled, and practical research, already exists. It involves focusing on the evidence, assessing it along each of its three credentials, and identifying the nature of the inferential reasoning involved. This paper identifies a number of ways in which practical, inter-disciplinary and collaboration could and should be developed to ensure that the courts receive quality evidence. It also argues that more attention should be paid to abductive inferential reasoning, both by researchers and courts. Copyright © 2011 John Wiley & Sons, Ltd.

Key words: relationship between law and psychology; scientific evidence; investigations and trials; inferential reasoning about evidence

INTRODUCTION

Youngs (2009), introducing a special issue of this journal on investigative psychology in the courts, argued that there is a chasm between law and psychology. However, she suggested that 'if the chasm between these two traditions can be bridged, the potential contributions investigative psychology has to offer the legal system in terms of scientific understanding and findings are considerable' (p. 3). This paper, whilst agreeing about the important potential contribution of investigative psychology, disagrees with the analysis of the problems and proposes an alternate route to inter-disciplinary collaboration. In summary, it argues that

- 1) The reported differences between psychology and law are more appropriately understood as between practitioners and academics or researchers of whatever discipline.

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The 'law' is not limited to what happens in courts, just as psychologists can contribute more than expert evidence.

- 2) The most appropriate and productive route to inter-disciplinary understanding is through a shared focus upon evidence, particularly inferential reasoning concerning it. (These arguments will be aided and illustrated by identifying the potential of 'evidence charts'.)
- 3) Psychologists' concerns about the admissibility of inferences from their research (e.g. that relating to offender profiles or the detection of deceit) should be considered in the light of the three credentials of evidence (Anderson, Schum, & Twining, 2005) and other insights being developed by the New Evidence Scholarship.
- 4) A focus upon these three credentials will demonstrate alternative routes to reliable inferential evidence being utilised in the courts and different disciplines being able to collaborate productively.
- 5) Both psychologists and lawyers need to pay much more attention to the use and misuse of inferential reasoning about evidence, particularly abduction.

PSYCHOLOGY AND LAW: SHARED FOCUS ON HUMAN BEHAVIOUR

Youngs (2009) noted that the courts in several countries have been reluctant to admit 'scientific' evidence upon certain topics. With regard to investigative psychology, these have included expert evidence on offender profiling (Freckelton, 2008) and the detection of deception (Vrij, 2008). It may be thought that the courts have been particularly hostile to receiving insights from psychology. Justickis (2008) has so argued in relation to 'scientific psychology'. But such analyses do not allow for the unique position of the 'human behaviour sciences' in the courts. Psychology may have emerged as a distinctive academic discipline over a hundred years ago, but lawyers and courts were analysing, generalising, assuming, and theorising about human behaviour long before then. As Hutchins and Slesinger (1929) explained,

For centuries the law has been fumbling with what has only recently become the subject matter of psychology. Lawyers, judges, juries, legislators, and governmental officers have always vaguely known that their task was the prediction and control of human conduct. In performing this task they built up an empirical technique of regulation called the law, in every branch of which, from contracts to crimes, appear assumptions as to why and how people act in given situations.... Out of this technique of regulation has grown a rough and ready science of behavior which crystallized unfortunately before the dawn of modern psychology. (pp. 13/14)

Law and litigation are, inextricably, bound up in theories, assumptions, etc., about human behaviour. That makes law and psychology distinctive. So, until an evidence base was developed upon certain topics, for example, memory and identification, it was not only natural but necessary for lawyers to draw upon other sources of knowledge, inference, or assumption. Lawyers knew that certain subjects, for example, physiology or engineering, were beyond their understanding, and they had to rely upon others' special knowledge. However, responding to, and predicting, human behaviour had always been a core component of their work. They could not avoid 'stepping in' until there was, demonstrably, an alternative and better source of knowledge on human behaviour.

However, although psychology has developed an evidence base on a range of topics, many lawyers have remained hesitant or reluctant to acknowledge its contribution. Often, they have preferred their own ‘fireside inductions’ (Meehl, 1989) about human behaviour. Until they have a much richer understanding both of what psychology can contribute, and they regularly adopt a rigorous practice of reviewing when, whether and how their ignorance may be a problem, such reluctance must be expected to continue. But other causes should also be appreciated, such as concerns about whether the many different costs involved in seeking scientific knowledge (including time) are worth the insights psychology offers. Until legal education not only broadens its syllabus (e.g. by including core topics in the science of human behaviour) but also expands the intellectual skills required of its graduates (e.g. the assessment of research methods), this reluctance must be expected to continue. However, as the rest of this paper argues, practical inter-disciplinary collaboration could immediately be enhanced by a common focus on evidence, and the proper inferences that can be drawn from it.

WHAT DOES NOT DIVIDE PSYCHOLOGY AND LAW

Youngs (2009) argues that a ‘chasm’ or ‘impasse’ remains between law and psychology ‘in part because scientific psychologists and lawyers are guided by fundamentally different epistemologies’ (p. 2). To evidence this, Youngs (2009) cites Canter’s (2008) identification of six key differences of approach. Canter (2008) argues that ‘the law is focussed on the case at hand’ (p. 3), whilst ‘psychology, as a science and profession, is still fundamentally nomothetic, focused on trends and patterns across sub-groups not on descriptions of actual persons’ (p. 2). Scientists reveal ‘underlying processes that can be distilled into a distinct set of facts, whilst the courts are actually trying to derive a plausible narrative’ for the litigant concerned (p. 5). Whilst psychology evaluates evidence according to scientific methods, the courts evaluate it according to legal criteria relating to due process (pp. 6–7). Courts work towards delivering a specific, justifiable, verdict; psychology seeks to contribute to knowledge, although it may, incidentally, have something to contribute to a trial (pp. 7–11). Lawyers focus exclusively upon evidence (that is, facts that make the issue being disputed more or less likely to be true), whilst psychologists are concerned with data whose relevance is not limited by a particular case or experiment (pp. 11–13). Law stresses personal agency, responsibility for choices and action, whilst psychology notes the significance of external factors beyond that individual’s control, such as their biology or social class (pp. 13–16).

Other writers, including psychologists, have made similar, overlapping, and additional points (for example, see Campbell, 1974; Haney, 1980, 1993; Schuller & Ogloff, 2001). Collectively, these alleged distinctions make a case for concluding that the law and behavioural sciences are incompatible. For example, law dichotomises; that is, it divides topics into mutually exclusive categories, whilst science recognises relativity. People are male or female, have a mental disorder or do not; their behaviour is reasonable or unreasonable, etc. Law is retrospective; it casts back to what is alleged to have happened, whilst psychology is prospective and is concerned to make decisions for the future. Law, unlike science, is not probabilistic; it requires no competence in statistics. Law, unlike science, is not causal; it applies conceptual categories—rather than tests of statistical significance—to determine whether defendants caused the harm of which they are accused (Campbell, 1974). But all these alleged critical differences have been shown to be false (Carson, 2003).

The false premise that psychology (or any other discipline) and law are based upon different epistemologies arises from the assumption that 'the law' is only concerned with what goes on in the courts. That premise involves an extremely narrow conception of what law is and what lawyers do (e.g. McCrudden, 2006). All of the alleged differences and incompatibilities relate to the practical exigencies of litigation. For example, it is perfectly natural, and indeed necessary, for practising lawyers to 'look backwards' at the past behaviour that provides the evidence for a trial. However, when they draft a contract, they predict and focus upon the future behaviour that they wish to regulate. When a court decides that the defendant 'caused' the victim's death, even though ambulance officers were slow in getting him to a hospital, and the receiving doctor's treatment was thoroughly bad, it does so because it is applying the law's test of responsibility for originating the chain of events that allowed others to add their errors.

One practical consequence of 'doing law' is a valuing of exclusive categories and dichotomies. Legislation and litigation rely upon identifying and enforcing categorical distinctions. People are categorised as being 'mentally ill' or not, as possessing capacity to make a contract or not, as having behaved reasonably or unreasonably. Having sharp distinctions minimises uncertainty and confusion; it is an essential and efficient means of protecting our rights and liberties. Generally speaking, legal instruments, such as statutes, wills, and contracts, are regarded as well crafted and successful to the extent to which they avoid problems of interpretation. But whilst most of these distinctions work well most of the time, they can break down (e.g. the distinction between male and female gender (*Corbett v. Corbett*, 1971)). However, the law is not alone in using them. They are a by-product of the classificatory systems that every discipline utilises. They have practical value. Investigative psychology, for example, distinguishes between offenders' 'organised' and 'disorganised' behaviour (e.g. see Canter & Youngs, 2009, pp. 336–343).

Dichotomous, or classificatory, reasoning has a necessary and valuable role. The problems are, first, that particularly in certain contexts (here we are concerned with the law and trials), the need for a decision (verdict) can give distinctions (e.g. whether the defendant was, or was not, experiencing a legally defined mental illness), a significance that they would not otherwise receive. Clinical psychologists, for example, regularly treat consenting patients with minimal legal intervention or supervision. Dichotomous reasoning is a feature, or cost, of our trial system. Second, dichotomous reasoning can be adopted uncritically. If the law of the land specifies a distinction (e.g. only those falling within a particular category will benefit from a legal defence), then those appearing before our courts must expect to have to adapt their evidence to that reality, to that way of thinking. That is a feature, or cost, of our democratic system that psychologists, and others, are welcome to seek to change when not in an expert witness role. But whilst these methods of reasoning may be necessary within a courtroom, non-lawyers should not uncritically adopt them in other contexts. Dividing serial offenders' behaviour into either 'organised' or 'disorganised' may have been a necessary and valuable first step when investigating the potential of this factor as an explanatory and/or predictive aid (Ressler, Burgess, Douglas, Hartman, & Agostino, 1986). But it is surely a variable, a difference of degree, rather than nature or category. Whilst the differences between two or more offenders' behaviour may be so great as to merit, if not command, the use of different language for many purposes, the character of the distinction remains one of degree. Canter and Youngs (2009) recognise 'the inappropriateness of trying to classify people in terms of distinct types' (p. 111). They, correctly it is submitted, prefer reference to dimensions and themes as recognising the

reality of relativity. The challenge, for co-operation between law and psychology, is to find methods and a common focus that will not distort the reality of evidence about human behaviour but that will recognise the pragmatic necessities of litigation and lawmaking (which here includes drafting contracts and wills, etc.). The answer, argued below, is to focus on inferential reasoning about evidence that, particularly through identifying the three credentials of evidence, recognises the relativity of knowledge.

The distinction, which should be drawn, is not between law and psychology but between 'academics' and practitioners, whether they be lawyers, psychologists, or whatever. Practising lawyers will be concerned with the particular case, and evidence from the past, when in court; did this witness correctly identify the defendant? But, on other occasions, they may wish to influence the future behaviour of many people; for example, they might draft a statute designating particular behaviour as criminal or rewrite a code on how best to organise an identification parade (e.g. requiring sequential—rather than simultaneous—viewing of faces). Equally, a practising psychologist will seek to understand a client's past behaviour in order to help him or her address current and future problems. Lawyers can recognise that human behaviour is shaped by many factors outside of our immediate control, for example, our education and upbringing. But courtroom lawyers know that such information will not provide a defence, let alone a justification, for criminal behaviour, although it may be relevant to mitigate the sentence. Note that most of the distinctions that Canter (2008) identifies make specific mention of law or lawyers in courtroom contexts. Whilst the differences he identifies between the disciplines are genuine, they are time and place specific. He agrees "it is necessary to find the common ground that both groups share in their perceptions" (p. 18). Part of that common ground is the nature of evidence and inferential reasoning about it.

The focus upon the alleged differences in methodology between psychology and law is, in part, an unfortunate by-product of some psychologists' inappropriate preoccupation with being allowed to give 'scientific' evidence in trials. It has even been said that 'the field of psychology and law is inextricably bound to developments in the area of expert evidence' (Faigman & Monahan, 2005, p. 632 endorsing Borgida & Hunt, 2003). The courts confer a form of 'legitimacy' when they recognise an area of scientific expertise as admissible in legal proceedings. It also creates an income stream for some experts. But psychologists will always be able to help more people, and they will make a greater impact upon law and legal practice, by promoting law reform. A new statutory test (e.g. about capacity to make a legal decision) will impact upon all future cases, not just a few where the parties knew about, and could afford, scientific evidence. A new procedure, for example in how criminal investigations are undertaken, may be developed without requiring new legislation. A multi-disciplinary consensus, upon improved practice, may be sufficient to effect change. This is not to deny that lawyers ought to be more aware of, and welcoming towards, the potential contribution of the behavioural sciences. But we do not need to exaggerate the differences between law and psychology.

SHARING A FOCUS ON EVIDENCE

A bridge enabling collaboration between law, psychology, and other disciplines already exists. Every discipline with a forensic potential can, and in the interests of enhancing justice by achieving more robust verdicts should, collaborate by focusing upon the nature and quality of inferential reasoning about evidence. This potential can best be explained,

and demonstrated, with reference to the work of Wigmore (1937), as rediscovered and refined by Anderson *et al.* (2005).

The traditional focus of lawyers, both academic and practitioner, reflects the pragmatic needs and interests of the trial courts. The 'law of evidence' is concerned with what is, or should be, admissible as evidence in a trial (e.g. Tapper, 2007). Consider the debates about whether and when 'hearsay' (secondhand) evidence or details of any prior offences should be admitted (Roberts & Zuckerman, 2004). But Wigmore (1937) and Anderson *et al.* (2005) are part of what has become known as the 'New Evidence Scholarship' whose interests include the identification, analysis, assessment, presentation, and trial of facts and inferences as evidence, both in theory and in practice (e.g. MacCrimmon & Tillers, 2002; Murphy, 2003). The admissibility of scientific evidence is but one issue for them. The development of a more rational, objective, and methodologically rigorous science of investigation and proof is a goal.

Wigmore (1937) developed a system for analysing and charting the evidence in a trial. Anderson *et al.* (2005) have both developed and simplified this. Traditionally, these charts 'grow' downwards. (See Figure 1 for the first steps in a very basic chart relating to a charge of murder in England and Wales. Note that it is presented here in a much more basic manner than it would be in a fully developed chart [e.g. see Anderson *et al.*, 2005, pp. 137–9; Bishop & Walsh, 2007]). The top line is the simple allegation that the defendant

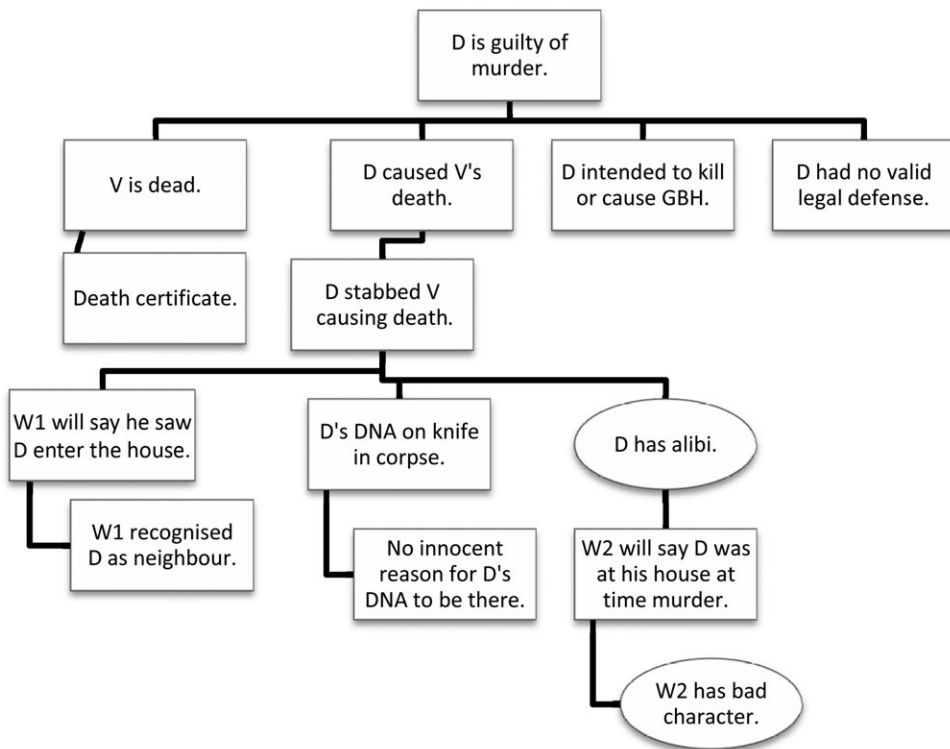


Figure 1. Example of what part of a basic evidence chart might look like in relation to a trial for murder in England and Wales.

D, defendant; V, victim; GBH, grievous bodily harm; W1, witness 1; W2, witness 2.

is guilty of the crime charged. This is the ultimate *probandum*, the last thing that must be proved. Therefore, the line immediately below this contains the penultimate *probanda*. It contains all the elements of the crime that must be established if the ultimate *probandum* is to be true. The contents of this line are determined by the law of the jurisdiction concerned. So, in relation to a charge of murder under the current law of England and Wales, this will be (i) the victim (V) is dead; (ii) the defendant (D) caused V's death whilst in the Queen's Peace; (iii) D intended to kill or to cause V grievous bodily harm (GBH); and (iv) D has no legal defence. These requirements are also known to detectives as the 'points to prove' (Stelfox, 2009, pp. 60–62).

All the evidence is then charted beneath the penultimate *probandum* to which it is related. The relationship between any proposition, and the further evidence that supports or detract from it, is explicit. Thus, these charts identify not only the evidence but also the inferential reasoning that is at the heart of every investigation and trial. In the system favoured by Anderson *et al.* (2005), evidence that supports a proposition (e.g. identification of D by a witness) is placed beneath it, whilst anything that challenges or minimises its value (e.g. that D has an alibi) is charted to the side. So, evidence that supports a challenge to a prosecution claim (e.g. an alibi) would be charted beneath it. But evidence can be charted in other ways, such as using different colours, different shapes for the nodal points, or connecting lines. Mind mapping software could be adopted with additional facilities for ensuring electronic links between the nodes and representations of the evidence (e.g. a direct link that can bring up a witness' statement or CCTV images when clicked) (Carson, 2010). Evidence charts provide an analytical overview of the evidence, of how it 'fits together'. They have many potential uses, from helping to assess the strength of a case (e.g. identifying 'weak spots') to helping a jury understand how the evidence 'fits together'. Whilst they are most likely to be developed by investigators and prosecutors, they are as valuable for the defence as the prosecution.

Evidence charts are recommended as a means of identifying the potential for a shared focus upon the nature of evidence and the inferential reasoning. That they are not regularly developed by investigators, prosecutors, or lawyers—they are novel and time-consuming—cannot detract from their potential as a tool and model for thinking about evidence across all disciplines. They enable us to think about how, for example, inferences may be drawn from a serial offender's behaviour and where that contribution 'fits in'. Of greater importance is that this approach will encourage everyone to think about the value—the credentials—of each piece of evidence and how that may be established.

WE ARE ALL CONCERNED WITH THE CREDENTIALS OF EVIDENCE

Evidence charts help to illuminate the three credentials of evidence. These are the relevance, credibility, and inferential power or weight of each piece of evidence (Anderson *et al.*, 2005). 'Relevance', here, has two meanings. Lawyers traditionally think of the relevance of evidence in a categorical manner. In this first sense, facts are only 'relevant', and therefore evidence if, directly or indirectly, they make a penultimate *probandum* more or less likely to be true. (The fact that your fingerprint or DNA is on a kitchen knife is of no relevance if the accusation is that you parked your car improperly.) But 'relevance' also has a second meaning in this context. Evidence charts show how, analytically, each piece of evidence (piece of the jigsaw) relates to the total allegation. Some pieces will be more relevant, important, than others. For example, your evidence that D was in your

house at 4.00 pm might be useful to show that D could have been at the nearby crime scene at 4.30 pm when V was killed. But your evidence that D was still in your house at 4.30 pm would be highly relevant to support alibi evidence to the effect that he could not also have been at the crime scene. Evidence that is charted as directly linked to a penultimate *probandum* is clearly of the greatest relevance, for example, the defendant's confession to committing the crime. It has considerable value, relevance, to substantiate the contention that D did as he or she said. However, relevance is just one credential; the credibility and inferential weight, of that confession, must also be considered (see below). Other evidence, for example, that a prosecution witness has a good character, will not be so relevant because its role is to support other evidentiary claims. It would not be charted so close to the penultimate *probandum*. Even if academic discussions rarely highlight the problems of resources for trials (e.g. such costs as expense, time, etc.), they are highly relevant. Prosecutors must exercise judgements, before and during trials, about the value of calling evidence if it will add little extra value and if it has little relevance. Evidence charts could help them make these judgments by identifying the branches bearing relatively little extra relevance or evidentiary value.

The issues that Youngs (2009) raises, concerning 'the law's' willingness to utilise insights and research from investigative psychology, are more concerned with the other two credentials of evidence, that is their inferential weight (or power) and their credibility. Imagine, for example, that D's DNA was discovered on a knife at the scene where V died. Investigators' initial responses are liable to be very positive because such evidence is regularly considered to be very powerful, highly persuasive in court. Generally, it has a high inferential weight or power. But, again, the other two credentials (relevance and credibility) must be considered in the context of the particular case. That D's DNA and fingerprints were on a knife, at the scene of a crime, will be of little relevance if V was shot. Moreover, even if the DNA and fingerprints were on the murder weapon, that evidence could lack credibility if, for example, the samples or prints were improperly taken, retained, worked upon, or documented. The three credentials are independent. Some evidence, for example, a confession, may be highly relevant and therefore mapped close to a penultimate *probandum*. However, its inferential weight and/or credibility might be very poor (e.g. the confession might have been coerced), making it of little overall value.

The challenge, for inter-disciplinary collaboration, is to identify appropriate ways of assessing, and enhancing, the inferential weight and the credibility of different forms of evidence. This involves a much broader agenda than the current preoccupation with securing judicial recognition for more areas of psychology, or any other discipline, as 'scientific'. Decisions, such as those of the US Supreme Court on when evidence may be regarded as scientific and therefore admissible (*Daubert v. Merrell Dow Pharmaceutical Inc.*, 1993; *General Electric Co v. Joiner*, 1997; *Kumho Tire, Ltd. v. Carmichael*, 1999) or statutes, if the proposals in the Law Commission (2009) are turned into legislation, can only provide threshold tests. They can only get the evidence 'in the door' of the court. They may allow more scientists to express opinions about their domain, but it does not follow that that evidence will be valuable. Focusing upon the credentials of evidence, particularly their potential credibility and inferential weight, will enable us to consider a much wider range of approaches.

Scientists will continue to seek 'direct' ways in which more reliable claims can be made. They will focus upon being able to show that, following explicit protocols to ensure control of variables and comparability, different researchers reach sufficiently similar conclusions, for example, about the behaviour of those telling lies versus those repeating the truth. But

other approaches are available. Consider the 'indirect' routes some forms of evidence have taken to 'judicial recognition', for example, the perceived reliability of suspect interviews. Previously in England and Wales, before police interviews were routinely audio taped, their reliability was regularly questioned. It was easy to challenge them as there was no direct, 'concrete', record of the interview, just a police officer's account that could be argued to be partial or inaccurate. Now, especially when they are also video-taped so that third parties can observe the absence of any obvious malpractice, police interviews are accorded much greater credibility, respect, and reliability. Challenge is much more difficult. The changes were recommended by a Royal Commission (Philips, 1982), which commissioned research, and they were given effect in codes established by the Police and Criminal Evidence Act 1984. Psychological research into memory processes has led to interviewing techniques (e.g. the cognitive interview that enable suspects and witnesses to remember more with, at least, no reduction in the reliability of that information (e.g. Milne & Bull, 2003). The value of the research is not questioned, but attention is drawn to how the simple adoption of an auditable procedure, audio-taping, also made a considerable impact. Moreover, the value of the research has been further enhanced by its adoption into professional protocols for ethical police interviewing (ACPO, 2009).

Consider also the changes in the perceived reliability of children's evidence. Young children used to be regarded as unreliable witnesses, as natural liars (see sources cited in Spencer & Flin, 1990). Now, after research-informed discussions and documents that convinced government (e.g. Home Office, 2002), rather than from instances of expert evidence, we have special measures for taking their evidence (under the Youth Justice and Criminal Evidence Act 1999). Indeed, in *R. v. Barker* (2010), a 4-year-old child was treated as competent to give evidence about what occurred whilst aged three. There has, effectively, been a revolution in attitudes and beliefs about children's evidence. So, the argument is that we should not focus exclusively upon the 'what', that is the nature of the evidence (e.g. the interpretation of crime scenes), or upon its inherent 'scientific credentials'. Rather, we should also consider the 'how'; how different forms of evidence can have their relevance, credibility, and inferential weight enhanced—and challenged. Arguably, the most valuable boost to identification evidence came when the courts identified some of the criteria that should be considered when considering its relevance, credibility, and inferential weight in actual trials. The criteria, now often referred to by the mnemonic ADVOKATE, were identified by Lord Widgery, Chief Justice, in *Turnbull* (1970). (The US has a comparable decision, from its Supreme Court, in *Neil v. Biggers* (409 US 188 [1972])). They include such issues as the distance between the witness and the person or object he or she observed. The criteria appear to be based upon the report of an official inquiry chaired by another eminent judge, Lord Devlin (1976), where the extant research was considered. So, this is another example of how appropriate advances can be made outside of courts for later adoption in court without the limits imposed by a focus on the status or admissibility of particular forms of expert evidence.

This is not the place to develop theories as to how generic forms of evidence might be rendered more trustworthy; however, one technique involves enhancing the 'concrete' character, or 'visibility', of evidence. Fact finders, it is submitted, prefer (consider more credible), physical evidence that permits them to 'see' or otherwise to test directly the reliability of the claims and inferences being made about it. Consider the growth in use of CCTV and other images, stills and videos, in trials (see also Feigenson & Spiesel, 2009). Moreover, expert witnesses can choose to present their evidence in a manner that emphasises its physical, tangible character. For example, an expert witness on handwriting or

fingerprint could display enlarged charts of the evidence and directly demonstrate similarities and differences to the judge and jury, rather than simply rely upon his own opinion and professional reputation. It is submitted that authorities on the interpretation of crime scenes could develop comparable techniques to rationalise one interpretation as being more likely than another.

Youngs' (2009) concern, about the law's treatment of psychological knowledge, is particularly concerned with considerations relating to the inferential weight of different forms of evidence. How, for example, should inferential weight be assessed and expressed? And, critically, is it the 'actual' or the perceived inferential weight of different forms of evidence? As Hutchins and Slesinger (1929) explained (see above), the courts developed a series of assumptions about human behaviour. Many have had to be challenged. For example, excessive belief in the reliability of memory and identification evidence has led to a number of apparently innocent people being wrongly convicted. Scientific developments have made it possible to review historic court decisions such as by subjecting retained evidence to DNA analysis that was not possible at the time (Connors, Lundregan, Miller, & McEwen, 1996). Confession evidence has also been accorded more weight than it deserved (Gudjonsson, 2003). However, by focusing on the credentials of evidence, we have an opportunity to ensure more informed weights are applied. But, to achieve that, we will also need to focus on how we reason about evidence.

INFERRING FROM AND TO THE EVIDENCE

This paper argues that the law and other disciplines can and should collaborate by focusing upon investigations and proof in trials. To this point, the emphasis has been upon identifying evidence and assessing its credentials. But trials and proof require an assessment of all the evidence, that for the prosecution (supporting proof of the ultimate *probandum*), that which detracts from that evidence (i.e. is relevant to the defence), and evidence that is missing whether that is because it has not been acquired (i.e. someone is known to have witnessed the crime but has not been found), or because there is a 'gap' (comparable with a missing jigsaw piece). The judge or jury must draw inferences from that evidence, both from individual pieces of information and when it is collated together as the branch of an evidence map. The core and common feature of these processes is inferential reasoning about evidence. That provides another opportunity, not obstacle, to the adoption of psychological and other scientific insights and research.

Unfortunately, inferential reasoning about evidence has not received the attention it deserves. There are three forms of inferential reasoning: deduction, induction, and abduction (Anderson *et al.*, 2005; Schum, 1994). Deduction and induction are widely recognised in investigative psychology (e.g. explicitly recognised in Canter & Youngs, 2009). In marked contrast abduction, whilst recognised as central to forensic pathology (Nordby, 2000), and practised by detectives albeit without being so named (Innes, 2003), it is not mentioned in some recent texts on investigations (e.g. Canter & Youngs, 2009; Fraser & Williams, 2009; Stelfox, 2009).

Deduction involves drawing a conclusion from what we already know. It is most clearly represented in the form of a syllogism: 'all liars fidget, D fidgeted; therefore, D is a liar'. If the premises are true and the correct syllogistic form is adopted then, and this is the distinctive feature of deductive reasoning, the conclusion has to be true. But the premises in this example, the assumptions about human behaviour, are not true. All liars do not

fidget. The problem for the courts is that there are few, if any, generalisations about human behaviour that are universally true.

Induction involves making an inference from what we already know. With inductive reasoning, we are not certain about our premises and, therefore, we cannot be sure about our conclusions. 'Ninety per cent of liars fidget; D fidgeted; therefore, there is a good chance that D is a liar'. If it is indeed true that 90% of liars fidget then we could justify drawing such a conclusion, although we ought, amongst other things, to be circumspect about the comparability between D and the research population and the circumstances in which they fidgeted. Clearly, inductive inferential reasoning is the staple diet of scientific psychology.

Abduction involves generating an inference that explains what is already known. 'D began to fidget when asked questions on a particular topic. That may have been because he began to lie'. Abduction, distinctively, is a creative process (Schum, 1994). Unlike the other forms of inferential reasoning, it generates ideas, theories of the case, and hypotheses (see discussion on 'hypotheses' below). Significantly abduction, not deduction, was the distinctive inferential process of that paradigm, albeit fictional detective, Sherlock Holmes (Carson, 2009a). However, whilst novelists can arrange for their characters' abductions to be correct, that is not a characteristic of the reasoning process. Abductive inferences must be checked, particularly by inductive reasoning. Could there be other reasons why D began to fidget at that stage? Only deductive inferences, when properly applied, can assure us of the truth of a conclusion.

Charts present and analyse the relationships between the evidence collated. They particularly facilitate a focus upon the inferential reasoning that is the 'engine' of proof. Deduction and induction are always represented. The top two lines of an evidence chart involve deductive reasoning. If the penultimate *probanda* are satisfied, then guilt follows, necessarily, because they merely articulate what the specified crime requires. But, of course, we cannot be sure that the penultimate *probanda* are satisfied, although some (e.g. that V is dead) may be accepted by all the parties. So, recognising the impossibility of assurances of perfect evidence that would permit deductive reasoning, the law has specified less than absolute standards of proof for different *probanda* (e.g. 'beyond reasonable doubt'). These penultimate *probanda* are reliant upon both inductive and abductive inferential reasoning.

Charts are particularly valuable tool for identifying the many inductive inferences that will be involved. For example, the witness' evidence is relevant, credible, and powerful because she recognised the suspect, having observed him over several minutes, at close quarters and without being frightened. But how should each of those credentials, particularly credibility and inferential weight, be assessed? And when the values for each piece of evidence have been assessed, for example, that the witness recognised the suspect, how are they to be added to (or subtracted from if it is evidence for the defence) other pieces of evidence, such as that the observation lasted for several minutes? Whilst it is not suggested that explicit or 'hard' values can be derived for such forms of evidence, at least at this time, the analytical discipline of thinking rigorously about the appropriate credentials for each piece of evidence should improve the reliability of decision making. The discipline should, for example, include checking that inappropriate generalisations (Anderson *et al.*, 2005) or assumptions are not being made and ensure that the assessments have been particularised to the circumstances of the case.

The same approach can be applied to topics that are more closely associated with evidence based upon experts' opinions, for example, the prediction of risk. Consider that

serious criminal activity at an early age is a predictor for re-offending (Berk, Sherman, Barnes, Kurtz, & Ahlman, 2009). This offender's record includes serious offences at an early age. Therefore, we can infer that he is a risk for re-offending and, because of the quality of this particular research, we can begin to quantify it. That example involves inductive, not deductive, reasoning because—like most, if not all, forms of knowledge involved in forensic inquiries—it is based upon relative, not absolute, science. We cannot, correctly, imply an 'all' statement such as, 'All those who seriously offend at an early age will re-offend'. (Even if that generalisation was permissible, we could not conclude that a particular individual had re-offended on this occasion.) The scientific knowledge currently available does not permit such a claim and belief systems, that humans choose their behaviour, would not permit many people (perhaps particularly lawyers), to agree. Instead, we have to investigate (i) the scientific merits and (ii) the 'policy' implications of drawing conclusions from such findings. (i) How appropriate is it to conclude (e.g. how likely is it) that D falls within the group of such people who re-offend? And (ii) should the investigators, magistrates, jury, and parole board hear about that information because they may/should be influenced/biased by it? Just because powerful and valuable inferences may be drawn, from certain forms of inductive knowledge, it does not follow that they should be. At least in England and Wales, it is not just the inferential power of the evidence in a trial but the perceived propriety of using certain forms of evidence and inference (Roberts & Zuckerman, 2004).

Youngs (2009) is, in effect, appealing for less prejudice against the use of inductive inferences from knowledge developed by investigative psychologists. This might be secured by inter-disciplinary collaboration on when and how apt inferences may be made. If scientists appreciated lawyers' concerns about the prejudicial effects of certain forms of evidence, then it may be possible to devise strategies that reduce their concerns. It might, for example, be productive to adopt an explicit 'risk' framework. How can we reduce the likelihood, for example, of juries misunderstanding certain forms of evidence (e.g. inferring that D is guilty of this offence simply because he offended as a young child), and/or the seriousness of the consequences if they do?

But equal, or greater, concern ought to be demonstrated over the use, and non-use, of abductive inferences in investigations and trials. Some abductive reasoning will be represented in an evidence chart. The chart will reflect the investigators' theory, hypothesis or 'story', about what happened. Thus, they will have used the knowledge they already possess, or more strictly what they believe they can prove to a satisfactory standard, to generate a theory of the case. But, as the defence are likely to emphasise, that is not necessarily the only or best explanation for what is currently known. It is not, at least in an adversarial trial system, the jury's duty to investigate alternative theories. They cannot know what a more extensive investigation, which logically must always be possible, might have divulged. However, in that they are required to consider the extent to which they entertain doubt about the prosecution's version of events and to adjudge whether that doubt is reasonable, they are bound to think about alternatives. But will their abductive reasoning be appropriate? Will they draw upon assumptions, or 'common sense reasoning,' that are inappropriate and go unchallenged in the courtroom? For example, will they think that witnesses who avoid eye contact or fidget are lying? Will they agree with the lawyer who argues that a witness is unreliable because he 'changed his evidence?' The witness might have described what he or she saw in different words, and with more or less detail, between the first and a later interview by police officers. But those 'changes' in evidence may be explicable. The witness may have found more or better words to describe his or her

experience some time, rather than immediately, after the event. And he or she may have interpreted the officers as seeking a fuller description during the later interview. The concern ought to be that the abductive insights of psychologists Arne Trankell and Udo Undeutsch, which have been supported by subsequent research associated with Statement Based Content Analysis (Vrij, 2008), would support the latter inferences. But expert evidence on such research is not admissible in most common law countries (Vrij, 2008). However, alternative abductive inferences could and should be considered during the investigation and not just the trial. If the abductive inference is 'reasonable', perhaps again applying a risk framework, then the investigators can search for further evidence to test it. That the inferences are based upon a science that is not currently admissible as expert evidence at trial is not a problem during an investigation.

For example, it might be suggested that the evidence currently available indicates that E, not just D, could have committed the murder. Further investigation, for example, by checking whether E has an alibi, could be undertaken to add to or to challenge this fresh 'interpretative' fact. So, abduction is central to the quality of investigations and the rigour of trials. For example, a major cause of miscarriages of justice has been identified as case construction (Maguire & Norris, 1992). This occurs where and because investigators identify a suspect, at an early stage, and then focus upon finding evidence that supports the hypothesis that he/she is guilty rather than finding more, general, evidence. If investigators are encouraged to develop and apply abductive inferences (Carson, 2009b), that is to contemplate alternative explanations for the existing evidence (e.g. different ways in which the crime might have been committed by other people), they are less likely to make this sort of error associated with premature decision making. Abductive inferences are also important for considering the potential implications of missing, or negative, evidence. Investigators could ask themselves which forms of evidence might exist, but which they have not yet identified, that would explain the existing evidence in a significantly different manner. There are, necessarily, financial constraints on investigations. The potential implications of limited resources should be explicit.

Psychologists have a great deal to offer investigators and prosecutors in terms of identifying inappropriate assumptions about human behaviour (e.g. decision making) and considering plausible alternative scenarios. One way forward would be to improve forensic investigations so that juries can place greater trust in them. Trials are already, at least in part, reviews (audits) of the quality of the investigation undertaken. Were the police thorough, at least in terms of good practice? Did they sufficiently investigate plausible alternatives? The disciplines can and should collaborate to ensure more rigorous investigations.

If these arguments are accepted, then the relative absence of reference to abductive inferential reasoning in contemporary discussions of investigations, is disturbing. It might be understood in terms of certain disciplines, such as psychology, having a preference for reference to 'hypotheses'. Although there may be an overlap in how the expressions are used, there are also significant differences. For example, psychologists' hypotheses are liable to be constructed, for research purposes, in order to identify questions/inferences that may be researched in an acceptably rigorous manner. Those hypotheses will be influenced by the researcher's perspective, by his or her needs, methods, resources, etc., rather than just by the case in hand. 'Hypotheses' may also be developed by investigators but, it is submitted, some manuals offer poor advice. For example, the Association of Chief Police Officers has endorsed advice (2005) to the effect that 'hypotheses should only be used when absolutely necessary' (p. 72). They should also 'offer the most logical, explanation of the facts as they are known' (p. 71). Although it is perfectly understandable that inves-

tigators should be discouraged from spending excessive time and other resources contemplating 'unreasonable' alternative explanations for the evidence (i.e. abductive inferences), there is no necessary reason why an abduction, which proves to be valid, would appear 'logical' or 'reasonable' at the time it was generated. This advice could inhibit critical thinking.

There may also be a concern that abductive inferences are equivalent to 'clinical' predictions. There has been, for example, a long and forceful debate as to whether clinical or actuarial predictors are the more powerful, reliable, (e.g. when predicting the potential dangerousness of a mentally disordered person, Monahan, Steadman, Silver, Appelbaum, Clark Robins, Mulvey, Roth, Grisso, & Banks, 2001). Abductive inferences may 'sound' like clinical predictions, given the value placed upon individuals' creative insights into alternative or additional explanations. For example, some offender profiling, based upon clinical insights rather than actuarial methods, has been criticised (Canter & Youngs, 2009).

CONCLUSION

This paper has, hopefully respectfully, used Youngs' (2009) editorial in this journal to offer an alternative perspective on, and agenda for, investigative psychology and law. It has acknowledged that psychology and law have their differences but argued that they are not as great as often argued. The paper has argued that many of the problems arise from an inappropriate and narrow focus upon the law as what goes on in the courts. Greater interdisciplinary collaboration can be achieved outside of courts where the restrictions on expert evidence do not apply. In particular, there are many opportunities to collaborate on promoting the reform of laws and legal procedures and to improve the investigations, which are a pre-requisite for any trial, civil, or criminal cases. Universities could make a valuable contribution here. If we want universities to produce graduates who can not only restate substantive information (e.g. compare and contrast the inferential weight of difference forms of evidence) and follow procedures (e.g. analyse a disputed incident), but think critically and imaginatively (e.g. develop apt abductive inferences), can assess the quality and authority of both evidence and arguments, are not inhibited by but challenge disciplinary boundaries, and can demonstrate their competence in practical ways, why do they not offer degrees in investigations? Few topics could form the basis of a more intellectually demanding, not just practical, initial degree that would provide a requisite foundation for subsequent specialisation in many existing disciplines.

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