

DNA as ‘ready-made evidence’: An analysis of Portuguese judges’ views

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Abstract

The introduction of biological evidence in judicial settings raises particular modes of entanglement between professional cultures and perceptions of the probative value of evidence. When DNA evidence reaches court, it also challenges the perceived margins of critical assessment of the work and understandings of previous links in the chain of custody, like the criminal police, forensic experts, and the public prosecution services. Given the apparent neutrality of judicial institutions, how do Portuguese judges perceive and value biological evidence? And how do judges see their articulation with other operators of the criminal justice system? An analysis of interviews with Portuguese judges reveals the challenges in the evaluation of biological evidence, which is characterised as a ‘safe haven’, grounded as it is on an indisputable scientific authority. The suggestion of the presence of a cultural rift emerges, which, taken with the work of other epistemic cultures, leads to biological evidence being seen as ‘ready-made’ evidence on its arrival in court, thus limiting the role of judges in its appraisal.

Keywords: judges; biological evidence; cultural rift; ready-made evidence; epistemic cultures; inquisitorial

Introduction

From the end of the twentieth century up to the present day, we have witnessed development and expansion in the uses of science and technology in many areas of social life, among which lies the criminal justice system.

The propensity to co-produce science and law (Jasanoff, 1996) has led to a coming together of different actors, knowledge and practices, from the crime scene to the courtroom. Science and law can be seen as different systems of authority, with different cultures and practices, and forensic science can be said to bridge the gap between these systems (Roberts, 2013).

The introduction of DNA technologies for forensic purposes has carried an aura of infallibility and truth-making (Jasanoff, 2006).¹ However, in continental or inquisitorial justice systems, these novel technologies raised little to no controversy at all. This is likely related to the differences between the so-called adversarial and inquisitorial type justice systems and the respective roles of the judicial actors and institutions, and judges in particular.²

In adversarial systems, as the Portuguese, while “each piece of forensic evidence is a combination of different epistemologies of which it has been a part during its social life” (Kruse, 2016:153), it falls to the judge, as the “expert of experts” (Gill, 2016) to consider all the evidence which is collected at the crime scene and conveyed to the courtroom. The court thus emerges as a “centre of calculation” (Latour, 1987), where all the evidence and the work of the varied epistemic cultures converge (Knorr-Cetina, 1999).³ Criminal evidence and particularly biological evidence, are produced through the intervention of several social and professional cultures, like police forces, crime scene officers, laboratory technicians, prosecutors and judges, each with their distinct way of acquiring, interpreting, and conveying information, thus shaping epistemic cultures in the forensic context. The trial sessions are designed to (re)produce all information gathered about a case in order to make proof before the judge who will attempt to fit together the pieces of the puzzle which have been brought to court (Kruse, 2016).

Therefore, in an inquisitorial framework where institutions operate under mutually presumed neutrality in search for the “truth” of the facts, how do judges perceive biological evidence and its contribution for the criminal inquiry?

The main purpose is to look at DNA technology through the eyes of Portuguese judges in order to understand the social representations surrounding biological evidence held by those who have judicial decision-making power. It is important to assess its value⁴ as an aid to justice and how using it in court contributes to the delivery of justice in Portugal.

Methodology

The analysed empirical material draws from the postdoctoral research “DNA technology in the Portuguese criminal justice system: an analysis of judicial cases and the judges’ perspectives”. Fourteen semi-structured interviews were carried out with Portuguese judges in 2017 (three with judges of the Supreme Court of Justice and eleven with trial court judges). The script contained three main themes: DNA evidence and police work, DNA databases, and the Prüm system (Costa, 2019).

One limitation of the study concerns the low number of interviews made. Requests were sent by email to courts throughout the country, followed by snowball sampling, but there was a very low response rate. One explanation may be due to a reluctance and resistance to talking about aspects of justice, and/or matters with which they are less familiar. However, this was the first study to involve judges’ views regarding the use of DNA technology.

Before the interview, the participants signed a written informed consent and also agreed to audio recording of the interviews. Only one of the participants did not permit the recording. The recordings were transcribed verbatim. Excerpts from the interviews were coded in order to safeguard participants’ anonymity, by using the letter “J”, followed by a number. Although three interviews were made with Supreme Court Judges, they are not identified as

such in order to protect their privacy since they are part of a very restricted group. Besides, the smaller number of interviews made with this specific group of judges does not allow a comparison between the narratives of judges and Supreme Court Judges. A qualitative methodology was used and content analysis of the interviews was based on the principles of grounded theory (Charmaz, 2006; Clarke, 2005) in order to analyse the way in which judges evaluate DNA evidence in the ensemble of collected evidence and its perceived impacts on judicial decision-making. Drawing from a constructivist approach, this methodology intends to apprehend social reality through the meanings that participants attribute to their actions, objects, and interactions with others (Blumer, 1962). By not departing from an established theoretical framework, grounded theory enables the development of new concepts and theories, through the stimulation of the researcher's creativity (Strauss & Corbin, 1990).

Biological Evidence as a *Safe Haven*

The literature has shown that DNA technology is seen as a “truth machine” (Cole, 2007; Dror & Hampikian, 2011; Lynch, 2003; Lynch, Cole & McNally, 2008); however, it can also lead to dangerous levels of subjectivity, which is understood as personal idiosyncrasies, choices and judgements (Daston, 1992; Daston & Galison, 1992; Kruse, 2012, 2016). If in adversarial systems, DNA evidence would likely be subjected to interpretation protocols (Lawless & Williams, 2010), the documental aspects of inquisitorial investigation often reflect the articulation of professional knowledge with social and personal idiosyncrasies and subjective assessments⁵ which are carried forward from first attendants at crime scenes, criminal investigators, and prosecutors (Costa & Santos, 2019; Kruse, 2012). While there is notable scientific output surrounding the role of DNA technologies in criminal justice systems, predominantly in the UK and the USA (Cole & Lynch, 2010; Costa, 2017; Derksen, 2003; Jasanoff, 1995; Lawless, 2016; Lynch et al., 2008; Machado & Costa, 2013;

McCartney, 2006; Santos, 2014; Williams & Johnson, 2008), there remain gaps in scientific knowledge regarding how these technologies are perceived by judges and their role in the effectiveness of justice. This is particularly relevant for an inquisitorial-type criminal justice system as is the case of Portugal.

The passage of biological evidence through the laboratory (Latour, 1987) constitutes a moment for purification of objects, where they are described and classified to conform laboratory standards (Latour & Woolgar 1986) infusing them with an aura of objectivity and credibility that other types of evidence may not have. Nevertheless, despite the development and improvement of DNA technologies, the traditional forensic disciplines still represent an important feature of criminal investigation (Garret & Neufeld, 2009).

The vast majority of respondents believe that DNA evidence has added weight when compared to other evidence like eyewitness testimony, fingerprints, ballistics, etc. It is seen as highly reliable and more sound, and can offer a degree of confidence that other evidence cannot: “I would say that there is a perception that the evidence, when scientifically validated (...) raises fewer doubts (...) has added value (...) lends added confidence (...)” J08. Biological evidence is, therefore, seen by the judges as a *safe haven* as it is scientifically validated. “DNA, as it leads to a scientific judgement, allows us to create a safe haven foundation” J02.

The passage of biological evidence through the laboratory (Latour, 1987) lends it an aura of objectivity and credibility (Bechky, 2019) that other types of evidence may not have⁶. A certain “enthusiasm for technology” can be noted in the judges’ discourse (Costa, 2017),⁷ in which biological evidence emerges as unquestionable scientific truth and is therefore used whenever possible. Furthermore, in the judges’ view, there is more biological evidence than other evidence at the crime scene: “There are usually more DNA traces present” J09. They also believe that if there were DNA collection in all cases, it would make their job easier.

For another judge, a DNA contribution in all cases would make it easier to reach a judicial sentence: “It is very important evidence, isn’t it? It can contribute in this way if the perpetrator and the proof of the crime can be achieved more easily” J07. The greater confidence placed in biological evidence thus seems to be an element of certainty, since for the judges it delivers what it promises.

It is therefore of interest to see how biological evidence is appraised as compared to other evidence. For some judges, all evidence has to be weighed, since proven factual basis is the coordinated result of all the evidence. However, while it is assumed that all evidence is important, some items may be more important than others, depending on the degree of science behind them: “All evidence is important. There is some which lends (...) greater confidence in that it has scientific principles to back it up” J03. DNA evidence thus provides guarantees that other evidence does not, with DNA being seen as the main evidence, and the other evidence in a supporting role (Kruse, 2016). Although all evidence must be weighted by the judge, their value will vary according to their perceived epistemic weight, complexity, and objectivity. For instance, witnesses’ testimonies are valued according to an assessment of their credibility, as people may not always be seen as cooperative or even truthful. When conjugated with different types of evidence, testimonial evidence tends to be regarded as more subjective and difficult to assess accurately. DNA evidence can be used by criminal investigators and courts to corroborate witness statements and other types of evidence. As such, DNA evidence grew a reputation as the type of evidence that does not lie, while witnesses are more fallible (Lynch et al., 2008): “It is less likely to be influenced than testimonial, for example, you see? Witnesses are more fallible” J09. They also point out that witnesses are less and less likely to collaborate in helping deliver justice: “(...) witnesses are less and less collaborative (...) People talk a lot on television and (...) on the bus, but when they’re in a courtroom they talk less and less” J09. DNA evidence also

seems to be a means of checking the veracity of testimonial evidence: “DNA plays a fundamental role as the evidence that allows credibility to be given to a witness” J05. Thus, DNA evidence can be used to corroborate testimonial and other evidence.

This comparison between testimonial and biological evidence suggests a differential credibility. Biological evidence is seen to deliver facts, as it is immune to human intervention, whereas testimonial evidence seems to produce uncertainty, through witnesses’ lies or memory lapses (Kruse, 2016).

This leads some judges to believe that, although all evidence is considered, expert evidence is the most valued: “Among the types of evidence, when making my appraisal, I turn first to assessment of documented expert evidence, and only then do I combine it with testimonial evidence (...)” J012. For other judges, however, “It depends greatly on the context and corroboration of this type of evidence with other evidence (...)” J010.

Judges also point out other advantages of using DNA. One of them is that it enables surer and faster identification: “More certain and more easily. There are investigations in which we had to go round the houses to arrive at the perpetrator of the crime, but with DNA we go straight to the identity of that person” J07. The association of DNA traces at the crime scene with the “certainty” that it was that individual who committed the crime may demonstrate a certain “CSI effect” (Cole & Dioso-Villa, 2007). Some judges may believe that the fact that traces of a suspect were found at the crime scene means that that individual committed the crime: “If that person’s identity is extracted from that trace, it is inevitably that person” J010. Or: “With the lifespan that traces have (...) and there being no justification for the individual to be there, this demonstrates that it was they who committed the act” J09.

Lastly, this group of judges also highlights the important aid brought to judicial decisions, making the evidence fairer and easier. “I think it allows decisions to be more fair, more fair

in the sense of easier proof, you see? Because, of course, if there is a scientific basis for a decision (...) there is less risk of not being true” J08.

Thus, placing this trust in the power of DNA, they are giving “(...) a scientific coating to what basically is human judgement about the belief in something” (Lawless & Williams, 2010). Reading into the accounts given by the judges, DNA appears as a guardian of judicial decisions (Barzilai-Nahon, 2008), by which judges can support their decision on the available expert reports.

The following section will explore how the apparatus of laboratories, experts, machines, and a strong scientific foundation, is seen to warrant DNA evidence with a form of epistemic authority that has the potential to displace the probative value of other types of evidence. Consequently, this relative position of DNA evidence renders its interpretations and judicial uses more complex.

The Complexity of Interpretation

We can think of judges in inquisitorial criminal proceedings as “centre of calculation” (Latour, 1987, 234) as they are presented with all mobile inscriptions made by the CPBs, the PP, and forensic experts, into a case file that provides a certain stability and combines all different pieces of information about a crime. DNA evidence reports can be some of the accumulated items.

While a majority of the interviewed judges assume that the biological evidence is irrefutable, others, albeit recognising the potential of DNA evidence, are more cautious about its value: “This evidence is less fallible, but it does not work miracles” J08. Another judge also considers it to be highly effective evidence, but not infallible: “(...) DNA evidence is much more effective ... It makes the evidence system more effective and more rigorous, but not necessarily infallible (...)” J010.

Although it is less fallible than other types of evidence (documental, testimonial, fingerprinting, etc), it should not be weighed in isolation. Besides, DNA evidence can be based on different methodologies and source materials, each carrying particular dilemmas of interpretation (Lawless, 2012). It has to be considered against all the other evidence and also depends on the circumstances of the crime and the activity that can be inferred from the trace (Lawless & Williams, 2010). The fact that there are DNA traces at the scene of the crime does not in itself prove that a particular individual committed the crime (Amorim, 2012; Gill, 2016; Costa, 2017): “DNA evidence is not proof on its own (...) It merely proves that they were there for a time; it does not prove that they committed the crime” J02.

The relationship between biological traces at a crime scene and imputing the perpetrator of the crime thus requires more complex reasoning. The weight of DNA evidence is intrinsically associated with the story of which it is part (Lynch et al., 2008). The narrative approach to the interpretation of evidence is made more relevant in an inquisitorial context where forensic experts tend to reinforce their boundary of neutrality by avoiding contextual information that could lead to bias (Dror, Charlton & Péron, 2006) or by presenting results in terms which could influence judicial interpretation (Costa & Santos, 2019; Santos, 2014). This complexity involves not only associating the trace with the perpetrator, but also paying attention to evidence collection and maintaining the procedures of the chain of custody that allow it to be fully interpreted.

Perhaps other precautions need to be taken and actors in the judicial system should be aware of the potential dangers of DNA evidence, both in terms of collection and custody, or later in terms of the appraisal of the evidence. Because sometimes, DNA can tell us a lot, but it can also tell us nothing. But that is a question for after awareness is raised. J010

In the words of this judge, the importance provided by biological traces for justice is highlighted, but also an awareness of the need to take into account the way the traces were

collected, stored and transported, as well as the potentially dangerous subjectivities inherent to the interpretation of biological evidence.

Although forensic experts' work is crucial, the trace does not speak for itself (Daemmrich, 1998), as this depends on the quality of the work carried out before arriving at the laboratory. As well as biological evidence requiring more complex reasoning than other types of evidence, it is up to the police and the Public Prosecutor (PP) to investigate, but it falls to the judge to try to answer the question of whether there was a crime or not and who committed it. The reference made in the last part of the excerpt to the "after awareness is raised" refers to a critical analysis of this issue, in the sense that not all actors in the judicial system are able to make this distinction and interpret the relevance of a certain biological trace at a crime scene. In addition, it must be combined with other evidence and contextualised: "This evidence must be placed in context. (...) If it has no context (...), despite having all this expert value, it cannot lead to a conviction" J01. Being at the centre, to where all information gathered by multiple entities converges and has to be pre-produced, calculated, and given meaning, judges are likely to develop perceptions about the relevant epistemic cultures that intervene in the production of evidence.

Judges' Perceptions of the Work of Different Epistemic Cultures

As stated above, it is the judge's job to gather together all this conglomerated information (Kruse, 2016) and attempt to fit together the pieces of the puzzle which have been brought to court. So it is important to understand how the judge perceives the work produced by other epistemic cultures. These refer to different ways of knowing and acquiring knowledge from the standpoint of each culture's professional repertoire of experience and understanding. The judges were therefore asked to comment on their perceptions of the work carried out by the police, the Public Prosecutor's Office and experts.

The police

The police are the first component in the chain of custody of evidence. Their performance is reflected in their particular arena but also in the different social and technical arenas (Wyatt, 2014) that make up the chain of custody of the evidence. They communicate between different epistemic cultures, generating and circulating knowledge (Costa, 2017; Costa & Santos, 2019; Knorr-Cetina, 1999).⁸ Given the central role that they play, it is important to understand judges' assessment of their work.

Overall, it can be seen that the judges hold the work carried out by the police in positive regard, with comments noting the growing development and specialisation in police work. For some, "The police are making an effort to provide specialised investigators who go to the crime scene (...)" J01. Others emphasise the technical abilities of the police: "They now have teams that can work on the level of securing (...) the scene (...)" J05. Another judge also states that "Efficiency and professionalism have been sought and achieved and they are no longer mere apprentices or amateurs (...)" J03. Or, as another judge worded it: "(...) you will no longer see an inspector smoking there or a policeman who is smoking and drops ash and contaminates the entire crime scene" J01.

This emphasis on the progress in police work seems that it has not always been the case. By noting this evolution in their work, they are simultaneously showing the construction and negotiation of the professional identity of the police (Snow & Anderson, 1987). Interviewed judges notice the changes in the traditional role of the police in criminal investigations, which had previously been based on the interrogations of witnesses and suspects, to an increasing forensic awareness in crime scenes (Beauregard & Bouchard, 2010). This contrasts with the role of the police in the technological age, based on the collection of biological traces, equipped as they are with other means and expertise. In recognition of the

progress in the work carried out over the years by the CPBs, at the same time the judges interviewed assume a certain distance that can be interpreted as tacit confidence of the court in police work. “Regarding sample collection, I think the court trusts (...) those who handle the collected material and all those things. It seems to me that the evidence collection and custody procedure is rarely called into question” J010.

However, their discourse also reveals a perception that there are different practices within the police and between different CPBs, but even between different individuals, as some are more proactive than others (Costa, 2017).

It always depends on the individual, doesn't it? Because we work, we are individuals, and we always have some initiative; I don't know if it then depends on the leadership – I have no idea how it works internally. But, ultimately, it will depend on the person who is performing their duties at that exact moment. J07

Differences can also be noted in the way in which the different CPBs operate. According to the judges, the Judiciary Police (PJ) are better prepared and equipped to take a different approach in the way they present evidence: “Criminal Police personnel [PJ] have technical means at their disposal that are not available to the Public Security Police, not least because the catalogue of crimes they investigate is different” J03. A difference is also recognised in the level of qualifications and training: “The Criminal Police [PJ] have a different kind of training, you see? And this can be seen in the way their statements are drafted and the presentation of evidence, but they also have (...) means that the GNR almost certainly do not have” J012. They also express the perceived stratification between serious and volume crime, as well as the uneven attribution of resources to investigate them: “(...) I think the PSP and the GNR (...) obviously lack the means (...) And they have to intervene on a scale which may be much greater than the Criminal Police [PJ] (...)” J011.

By perceiving inequalities in resources and practices between different CPBs and between those police officers whose work is better and those whose work is worse, judges emphasise

that police practices, although nowadays grounded on forensic science and technological devices, are much more sociological than technological because of an exposure to the influence of contextual social factors (Kruse, 2016).

They also compare the training given to the police and the training given to judges and believe there is an imbalance: “(...) as regards the police, they have much better training than we [judges] have. I think this training should be the same (...)” J05. This interviewee also highlighted the limitations in the training for judges in this area, namely laboratory training to better understand the evidence that they have to assess in court: “People like me, who are deciding this, should necessarily have training. And not just one half-morning session (...)” J05. Thus, due to a lack of sufficient knowledge and training to question biological evidence, they may be forced into accepting the evidence as it arrives in court. Consequently, they are limited to accepting and validating pre-made evidence, that is, ready-made or “black-boxed”⁹ evidence.

Because otherwise the evidence is already made. In other words, with evidence which is made, it is easier to say: ‘The evidence is here, A2.3. Now we are going to put it together, this one, then this one, and it’s done. (...)’ Our work lies precisely in assessing the acquisition of evidence. J05

Another judge’s account is along the same lines. That is, as they did not follow the case in its prior phases, they have no responsibility for what was done earlier. “When it comes to the trial, the case is already prepared by the police, by the Public Prosecutor’s Office, and sometimes we can see that something else could possibly have been done (...)” J08. Thus, when they are deliberating on a case, they do not think about the work done by the police. This is not their role, nor is it what they are asked to do. This reveals a form of “boundary work”¹⁰ (Gieryn, 1983; Lawless, 2012) around the distribution of responsibilities and attributions of each epistemic culture (Kruse, 2016). In this case, technicians and forensic experts can assume responsibility for the traces from the moment they enter the door of the

laboratory and also for the reports they produce, but not for the work done previously by other actors, or interpretation in the courtroom. In addition, the use of the expression “something else could possibly have been done” can be framed in what Kopytoff (1986: 67) called “biographical expectations”. The judges’ expectations regarding the work of other epistemic cultures may reveal their powerlessness to take a step back in the case, and the notion of irreversibility looms in the chain of custody of evidence (Robertson & Roux, 2010), and that the evidence that arrives in court is ready-made. In this sense, it is up to judges to make a decision based on what they are given. The notion of ready-made evidence denotes the different epistemic cultures at play in the construction of DNA evidence, which shaped by professional repertoires and institutional interests. What is presented to judges as ready-made evidence can be the result of an instrumental use of DNA by the police (Santos, 2014), conferring scientific authority to a previously constructed narrative, according to their sociocultural understandings of a crime (Costa & Santos, 2019).

Public Prosecutor’s Office

As an epistemic culture, the PP could be described as a gateway between the CPBs and the courts. Their particular way of acquiring and producing knowledge implies not only legal expertise, but also a professional sensitivity to suggest and develop useful investigative activities. Based on the account built by the police, PP, who have the monopoly on criminal investigation in Portugal (Law 49/2008, article 16), compile the legal narrative that will shape an indictment. Although both the CPBs and the PP work closely together in the criminal investigation with the aim to produce an indictment, judges’ perceptions of their work is different.

While, on the one hand, the interviewees make a positive assessment of police work in general, despite some limitations identified above, they take a more critical stance with

regard to the PP, particularly relating to the liaison between the PP and the CPBs, and how effectively the criminal investigation is directed.¹¹ “There have been advances with the police; with the Public Prosecutor’s Office, there is now a greater problem of liaison with police authorities” J03. The idea of distance between the PP and CPBs and of discretionary practices emerges from the judges’ discourse, with some prosecutors liaising better with the police than others.

There are (...) public prosecutors who do not confer with police officers (...) I find (...) a public prosecutor who does not speak to police officers to be very strange, don’t you think? Others liaise very well (...) they talk about and direct police activity. J07

The judges’ accounts also point towards the PP abdicating responsibility when conducting the investigation: “(...) the Public Prosecutor’s Office has abdicated the effective direction of the investigation in a more general way than is suitable or correct” J011.

This critical stance towards the PP’s work may be based on what Costa and Santos (2019) called an ‘office culture’¹² and which can be seen in a passive attitude by the PP; not only are police officers not consulted with, but they are given autonomy to carry out investigative tasks, with the PP limited to managing from a distance.

(...) often (...) [the Public Prosecutor’s Office] had no direct intervention in terms of guiding or asking for due diligence throughout the investigation, or doing anything in the investigation delegated to the police. And so, the final report arrives, and based on that the Public Prosecutor’s Office brings charges or closes the case, or does whatever they want by way of ending the investigation. J011

In addition to the perception of different types of public prosecutors, with some having a more passive role and others more active, the following excerpt once again seems to corroborate the idea of an ‘office culture’ associated with them.

(...) there are different types of public prosecutors: those who leave the office, not necessarily physically, but they become more involved with and part of the investigation, and the public prosecutors who, shall we say, delegate more, with the police doing the work. J08

This description of the “office culture” means that investigative procedures fall mostly within the purview of the police, and PPs do not fulfil their role as the driver of criminal inquiry. The potential consequence of an office culture by the PP is that if there are mistakes, malpractice, or erroneous interpretation of traces by the CPBs, it may all end up being legitimised by the PP as they have little or no direct knowledge of the cases (Costa & Santos, 2019).¹³

I think the Public Prosecutor’s Office (...) clearly hands over to the Criminal Police, with the idea of their having autonomy in the investigation (...). I think there is no control or monitoring as such ... (...) They send them the case and then they want it back finished. J05

This excerpt once more highlights the ready-made evidence, and the judges also show that they feel somewhat uncomfortable with the liaison between the police and the PP. However, they temper this discomfort with the justification that cases that do not go well do not come to court. In other words, even if the liaison between the police and the PP may not always be optimal, when the case reaches the hands of the PP, it may lead to the case being closed because the evidence found was insufficient and not robust enough to take it to trial.

Obviously (...) cases in which police work is weak may not even come to trial, because the public prosecutor stops them, right? When it comes to the trial, we already have a plethora of evidence, which the police have normally had an important role in collecting; as a rule, this is well done, because there is enough evidence to bring someone to trial. J09

Naturally, judges only adjudicate on cases that reach the trial stage. Cases that are dismissed by the PP for not having sufficiently robust evidence do not reach court. Thus, the judge’s task is to make a decision on the evidence presented in court, while the PP is responsible for ‘filtering’ the investigation.

Experts

Experts hold a pivotal position between the court and the work of the police and the Public Prosecutor's Office. Responsibility for transforming material traces into legal meaning lies with experts in the laboratory and their role in court is to explain the evidence production process (Kruse, 2013). The experts' task is to produce reports based on the questions from the police and the PP about the traces collected at crime scenes or suspects, infusing scientific credibility to the investigation's interpretations. This should allow the constructed narrative to be supported and answer questions that had remained open about the crime. Biological evidence that enters the laboratory must therefore be made understandable to an audience of non-specialists (Amorim, 2012; Roberts, 2013) – the judges – so that they can appraise it.

The passage through the laboratory, as mentioned above, is a moment for purification of objects (Latour & Woolgar, 1986; Santos, 2014), lending the biological evidence an aura of objectivity and credibility which, from the judges' perspective, other evidence does not have. This purifying process is derived from the provision of probabilities that are interpreted as having greater credibility and security. "The value of expert evidence is very important (...) because it builds value for the evidence which is very difficult for other parties to contradict later" J05.

The judges' use of examples of probabilities shows how the uncertainties inherent in DNA evidence gain credibility in their passage through the laboratory; subjectivity arising from human intervention is eliminated (Daston & Galison, 1992; Lynch et al., 2008) and complexities of the processes are concealed in simpler conclusions (Star, 1983).

I would say it would have an evidential value of 99%. I do not see how it is possible to question DNA, the collection of biological samples. I have never, never seen a decision that excluded the power of biological evidence. I have never come across a single one. Therefore, I believe that its appraisal, its importance, is almost 100%. J012

An idealisation of biological evidence is clear in the judges' discourse as absolute truth and from what, in their view, is good science. The expert report makes it possible to eliminate uncertainty and seal the "black box": "The more expertise you put in, the better, right? (...) Because it closes off the defendant's possibilities for defence" J05.¹⁴ For some of the judges interviewed, the presentation of an expert report, based on the certainty of numbers (Porter, 1995)¹⁵, allows the responsibility of the judicial decision to be transferred to the report produced by experts: "Our work is increasingly difficult. (...) having a scientific basis gives another level of consistency and even saves us work, you see?" J09. This reverence of judges for scientific evidence refers, again, to ready-made evidence that does not let judges carry out judgement, or seeming to judge without judging.

For other judges, however, the fact that biological evidence is received from within a "black box", an "impenetrable and incomprehensible truth machine" (Amorim, 2012; Lynch et al., 2008) can pose difficulties in the appraisal of the evidence designated to them.

We often have expert evidence that really isn't exactly a great help. It says: 'I suppose, we could say this, but it might also be the opposite. Anyway, we can only go this far and from now on it's down to assumptions or probabilities.' The greater the degree of scientific certainty, and demonstrated scientifically, the greater the certainty for those who judge. J08

Although expressing enthusiasm about the power of DNA evidence, some judges feel disappointed when experts do not open the "black box" to provide comprehensive answers in the expert report to support the judge's decision.

Furthermore, while documentary or testimonial evidence is subject to the judge's consideration, DNA evidence seems to impose itself on the judge.

Expert evidence, in principle, is evidence that is imposed on the judge, unless the judge has sufficient scientific knowledge to break down that evidence J010.¹⁶

Thus, while on the one hand the magistrates' accounts indicate a degree of reverence for DNA evidence, seen as evidence that produces less doubt, that reverence may also be associated with the fact that the judges do not have enough knowledge to be able to contest it. "Expert evidence is removed from the judge's free conviction, so it is appreciated, it has weight, you see? Expert opinion is not ours to hold, so we have to get to the conclusion, colloquially speaking (...)" J07.

Acknowledging their own limitations in relation to the expertise presented in court, judges often end up having to accept the conclusions of the expert report.

The court must accept it as it stands, unless any of the grounds on which that expertise is based are considered to be incorrect (...) or there is an expert opinion of equal weight that could call that result into question. But, if this does not transpire, the court necessarily has to fully accept the conclusions derived from this expertise. J05

One way to alleviate the problems of liaison between different epistemic cultures concerning biological evidence lies in training and communication. According to a study by de Keijser and Elffers (2012), judges have a poor understanding of the probabilities presented in reports and a third of them consider that communication between judges and experts is not possible. According to Amorim (2012:267) "DNA cannot be treated as a 'black box'". Indeed, non-specialists must be enabled to understand the results by means of presentation and discussion. Roberts (2013:49) considers that "successful forensic science presupposes effective communication between criminal justice professionals at each stage of criminal proceedings". When this does not come about, it can create distance between different epistemic cultures and impair communication, causing what Roberts calls a "cultural rift"¹⁷ (Roberts, 2013, p. 53). This can be seen as the ability to alienate scientific understanding, forensic science and expert evidence, or not. On the one hand, communication allows knowledge of the other's world and, simultaneously, it allows this information to be placed

in a context that the other manages to grasp. This lack of communication leads to a “cultural rift” between the different epistemic cultures.

Whether in the report which they produce or when called to court to provide clarification, experts are circumscribed by their professional experience and protocol. It is not their job to interpret the evidence, but only to explain what it is written in reports. In Amorim’s view (2012, p. 267), it is a “comfortable opacity” that can also be understood as “bubble culture” (Costa & Santos, 2019, p. 2).¹⁸ Technicians and forensic experts can assume responsibility for the traces from the moment they enter the door of the laboratory and also for the reports they produce, but not for the work done previously by other actors (police and PP), or the interpretations made by the judge or the jury in the courtroom. Therefore, an expert will tend to avoid explaining how or why a given biological trace was found at a crime scene, or what may imply in terms of criminal offence.

The experts’ “bubble culture” is expressed in defensive attitudes such as repeating discursive formulas from forensic reports, making general statements about laboratory procedures, or plainly describing the methodological process (Kruse, 2016). Mainly, experts avoid breaches in their shield of neutrality by circumventing answers that can be understood by the courts as interpreting the evidence in the context of a given case (Costa & Santos, 2019).

In view of the difficulties of understanding reports and the lack of training in understanding biological evidence which judges experience, it is important to understand what strategies are used to deal with this “cultural rift”. In terms of communication between court and laboratory, the interviewed judges also have different practices. Some base their communication on bureaucratic formalism. One judge says that “There is no such thing as a close relationship; it is institutional” J08. Others point to the relationship based on records and written communication: “The relationship is mainly on paper (...) everything is done in

writing. Later we sometimes have clarifications from experts in the hearing. So, all possible collaboration is given” J06.

While some judges see formality as the guide for communicating with the laboratory and tend to accept expert written conclusions, others take a more informal stance, highlighting the advantages associated with informal contact: “My experience is that everything goes much faster and is much better when we pick up the phone and talk to people (...)” J07. Among the informal means of contact, special mention is made of phone calls, allowing any possible doubts and frictions in the appraisal and interpretation of expert reports to be removed. Informality thus emerges as a means for translating the most hermetic language produced in the laboratory into language, which is understandable for the judge. This is what Latour called “translational work”.¹⁹

Translational work thus enables coordinated communication on concrete aspects of forensic evidence. Therefore, as judges may lack the knowledge to interpret expert reports, translational work allows informal contact to function as a way of making the written report coincide with the reading of what is written in it (Galison, 1997).

Hence, either informal contact between judges and experts, or, as mentioned above, the presence of the expert in court, enables the judge to better clarify the reports produced and bridge the gap between epistemic cultures.

Since the evidence presented at trial is the product of a set of sociological and legal processes, the strategies employed by judges have an impact on communication. Formal contact tends to constitute a barrier to communication, while informal contacts tend to remove this barrier, leading to greater trust and mutual understanding between the different actors (Roberts, 2013).

Discussion

The Portuguese criminal justice system is based on inquisitorial principles, whereby the trial judge actively conducts the proceedings in order to establish the truthfulness of the criminal facts. Although biological evidence appears as a neutral construct, based on the certainty of science, it is not immune to social representations, epistemic cultures and legal system – adversarial or inquisitorial.

The data collected from the interviews suggests that DNA evidence is seen by judges as an important contribution to the criminal justice system, and that progress is recognised in the work of CPBs at the crime scene. However, the judges' role is dependent on the quality and extent of the evidence produced by CPBs, the PP and the laboratories. In this sense, the weight of epistemic authority that emanates from DNA technologies can imply a perceived shift in power from the police to laboratories, from the prosecutors to forensic experts.

The differences found in terms of the technical resources available to the different CPBs, as well as the 'office culture' and the degree of passivity of the PP in conducting the investigation are pointed to as potential obstacles to judges' decision-making. With most investigative tasks and decisions delegated to CPBs, who return a 'finished' inquiry to the PP, which is transformed into an accusation and taken to trial, the judge is left with little scope for action.

The epistemic authority of DNA evidence can be interpreted as a *safe haven* for the judge, mainly because of its passage through a laboratory and the intervention of experts, which raises the perceived neutrality and epistemic authority of this type of evidence. However, when it comes to interpretation, judges face the "comfortable opacity" or "bubble culture" that characterises experts' work. Rather than appraising the evidence, judges end up having to conform to what and how it is presented to them. DNA can thus be perceived as ready-made evidence, because its value cannot be challenged unless the judge has grounds for the disagreement. Even if, as some accounts point out, it is realised that something more could

have been done, when the evidence reaches court, it is almost impossible to redo the evidence, as “forensic evidence accumulates a pretrial biography” (Kruse, 2016:33).

The courts’ “machinery of knowledge construction” (Knorr-Cetina, 1999:3) becomes impacted by the “cultural rift” generated by the smoothing of imperfect translations when DNA evidence is moved along from the crime scene to the court, and to judges in particular. This can be observed in the Portuguese criminal justice system (and perhaps in other inquisitorial type systems). Although there may be common final objectives in adversarial and inquisitorial justice systems, their distinct configurations and roles attributed to judicial actors may contribute to different forms of evaluating the evidence and the contribution that biological evidence can bring to justice.

In the Portuguese context, the inquisitorial system’s structural impartiality tends to isolate the defence from the investigation and forensic procedures, and the defence only has contact with the accusation in a later stage, when the narrative is already constructed, the evidence collected, and any laboratorial reports delivered. In fact, re-examination of evidence or counter-expertise is rarely requested or admitted in Portuguese courts, favouring the idea that expert evidence is not contested (Costa, 2017; Machado & Costa, 2013). Vuille (2013) notes that trust in court-appointed experts, on the one hand, and a lack of awareness about the issues associated with scientific evidence, on the other, tend to generate attitudes of uncritical acceptance of expert evidence by the judicial community in inquisitorial justice systems.

Thus, not only the defence has little margin to contest the evidence produced as well as the judge is conditioned in his/her appreciation of the facts. On the one hand, they work with a ready-made evidence, and, on the other hand, they may not have sufficient scientific knowledge to question the evidence presented. Finally, the impartial role of forensic experts

and their defensive attitude during trials does not contribute to help the judge assess the evidence.

Conclusion

The interviews with judges reveal a judicial, cultural, and epistemic scenario where DNA evidence is seen to be produced with a high degree of credibility and epistemic authority. This may constrain the defence in its chances to contest the production of evidence and leave the judge with a narrow margin for interpretation of the facts. On the one hand, given the perceived epistemic authority of DNA evidence, judges can view DNA evidence as a sort of convenient *safe haven* that appears free from the subjectivities associated with other types of evidence. On the other hand, judges can be presented with ready-made evidence which they may not have sufficient scientific knowledge to question its production or challenge its interpretation.

Finally, the impartial role of forensic experts and their defensive attitude during trials can obscure rather than help the judge to access the evidence. As such, each epistemic culture creates and warrants its own knowledge, shaping institutional neutrality into cultural rifts that tend to affect articulation and communication within the criminal justice system and, crucially an unassailable aura of infallibility that DNA evidence seems to bring to the justice system.

This study sheds light on a cultural rift between the world of science and the world of law and indicates that greater liaison and better communication is required between different epistemic cultures (Costa & Santos, 2019). The data presented here are an example of imperfect translational work (Kruse, 2016). As a previous study has already shown (Costa & Santos, 2019), the PP needs to be more proactive and liaise better with both police and judges. In order for the system to become more effective and biological evidence to

contribute to justice, there is an urgent need to train judges to make good use of technology in their service. To this end, experts will have to give up part of the “bubble culture” in which they operate. This will allow for greater caution regarding the absolute value of scientific evidence and a just measure of the use of biological evidence. Finally, greater investment in liaison and communication between the different actors may allow greater knowledge of the value of biological evidence to justice, making it more effective. While this does not come to pass, “The temptation to usurp the judicial power and replace it by authoritarian ‘science’ still lurks” (Amorim, 2012:267).

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Declaration of Conflicting Interests

The author does not have any competing interests in the research detailed in the manuscript.

Notes

¹ It could be said that its first impacts were felt on the traditional forensic identification disciplines by uncovering their epistemological and methodological short-comings (Murphy, 2007; Saks & Koehler, 2005). Nevertheless, DNA technologies have suffered their own controversies, particularly in the USA (Derksen, 2003; Lynch et al., 2008), and have since been dubbed the ‘gold standard’ in forensic identification (Lynch, 2003).

² In adversarial justice systems, the disputing parties present the evidence to a lay jury, and the role of the judge can be regarded as somewhat passive in the assessment of evidence to determine matters of fact (Roberts, 2013; Shapiro, 2000). The contentious nature of proceedings favours attempts to deconstruct the credibility of evidence, with the chance that errors in the chain of custody or interpretation will surface during a trial (Lynch, 1998; Lynch & Jasanoff, 1998). Nevertheless, unequal access to resources and experts by the prosecution and the defence can produce harmful effects (Huff & Killias, 2008; Vuille, 2013). In Portugal, criminal proceedings operate under the inquisitorial principle, where the judge plays an active role as a “fact finder”. The evidence is presented during trial and the judge ponders each piece in order to establish facts as proven, or not proven, often assigning causal relations between evidence and facts in the production of sentences. The Public Prosecution (PP) bears the burden of proof and has the monopoly of criminal inquiry, being assisted by criminal police bodies (CPB) in the conduction of criminal investigations. The provision of forensic services is attributed to the Laboratory of Scientific Police, which is a branch of the Judiciary Police, and the National Institute of Legal Medicine and Forensic Sciences. The defence may request additional forensic exams to the presented evidence or to include new evidence. Any new forensic evidence must be authorized by the trial judge and produced by the aforementioned laboratories.

³ Epistemic cultures are described by Knorr-Cetina (1999:1) as “amalgams of arrangements and mechanisms (...) which, in a given field, make up how we know what we know. Epistemic cultures are cultures that create and warrant knowledge”.

⁴ “Value” is used in the sense of how different actors or groups react to the importance of an object. We consider Appadurai’s (1986) discussion on “commodities”, whereby objects have social lives. The value assigned to objects differ depending on what an object can offer in different situations for different actors. Value is used here in the sense of probative weight.

⁵ Daston and Galison (1992:82) consider that: “The history of the various forms of objectivity might be told as how, why, and when various forms of subjectivity came to be seen as dangerously subjectivities. Mechanical objectivity was indifferent to the subjectivity of, for example, personal judgment, dogmatic system building, and anthropomorphism”.

⁶ Murphy (2007) distinguishes between a first and a second generation of forensic sciences. The distinction is principally related to fundamental differences on security and reliability between the traditional forensic disciplines (1st generation), like ballistics, toolmarks, fingerprints, etc., and the new methods (2nd generation) headed by DNA technologies. Besides the epistemological rooting in scientific disciplines like chemistry and biology, there is also a transition from binary and categorical assertions of identity to an empirically-based probabilistic matching between samples and sources (Saks & Koehler, 2005). DNA technologies have also impacted the type, role and status of forensic experts, shifting resources and power in the apparatuses of crime control and investigation (Prainsack & Toom, 2010:1125; Santos, 2014). Nevertheless, despite the development and improvement of DNA technologies, the traditional forensic disciplines still represent an important feature of criminal investigation (Garrett & Neufeld, 2009).

⁷ This expression was used in Costa (2017:99) to characterize the socio-cultural practices and views of the local police. By opting for the “collection of biological remains/traces, the local police can first affirm their competence and legitimacy in the process of criminal investigation, and it seems that the choice of forensic artefacts linked to new technologies lends their work greater credibility”.

⁸ There are three Criminal Police Bodies (CPB) in Portugal: The Judiciary Police (PJ), which is a criminal investigation police; and the proximity police forces, the National Republican Guard (GNR), local police that operates in rural areas, and the Public Security Police (PSP), responsible in urban areas.

⁹ Bruno Latour (1987) uses the concept of the “black box” as applied in cybernetics to explain the complexity of machines and their commands. It is therefore only important to understand what goes in and what comes out. The black box is formed between two systems, being an obligatory passage point which connects them. They are composed of irrefutable facts. If there is any doubt about the interior, controversy arises.

¹⁰ Originally coined by Gieryn (1983), the concept of “boundary work” describes the enactment of ideological narratives designed to demarcate and separate “scientific” practices and discourses from “non-science” or “pseudo-science”. In this case, technicians and forensic experts can assume responsibility for the traces from the moment they enter the door of the laboratory and also for the reports they produce, but not for the work done previously by other actors, or interpretations in the courtroom.

¹¹ Costa and Santos (2019) refer to them as different epistemic cultures, characterising the police as a “hunch culture” – a sort of intuition-based reasoning, and the PP as having an “office culture” – a passive stance towards the construction of forensic evidence.

¹² Costa and Santos (2019) have argued that the inquiries by CPBs can be legitimised uncritically by the PP, merely by using more categorical language and a juridical framing to produce an indictment.

¹³ This position was seen in the Saltão case (Costa & Santos, 2019) and also in other criminal cases analysed by Santos (2015).

¹⁴ The defence is dependent on the evaluation of the evidence based on the reports presented by the official laboratories, which are rarely contested (Costa, 2003; Costa, Machado & Nunes, 2003). The defence may request additional forensic exams, but this has to be authorized by the judge.

¹⁵ According to Porter (1995), decisions that are based on numbers bear the appearance of fairness and impartiality.

¹⁶ Under the Portuguese Code of Criminal Procedure, technical, artistic, or scientific evidence is not subjected to the free appreciation of the judge. Its value cannot be challenged unless the judge has grounds for the disagreement.

¹⁷ In the author’s view, this type of cultural rift does not exist in the English system.

¹⁸ The experts' "bubble culture" is expressed in defensive attitudes such as repeating discursive formulas from forensic reports, or making general statements about laboratory procedures. Mainly, experts avoid breaches in their "shield of neutrality" by circumventing answers that can be understood by the courts as interpreting the evidence in the context of a given case (Costa & Santos, 2019).

¹⁹For Latour (1987:194), translational work has a "geometric meaning", dealing with "transposition from one place to another", with a view to opening up new interpretations of the facts.

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