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Judge and Jury Perceptions of Open Source Evidence

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Abstract

Open source evidence has come to play a central role for our ways of knowing about human rights violations and atrocity crimes. Yet, little is known about how judges and juries assess and evaluate such evidence. This chapter presents unique empirical insights from qualitative interviews with international judges, and from a fictional jury trial designed to explore lay factfinders' perceptions of open source evidence. It examines the perceived limits of open source evidence, source credibility and source bias, and factfinders' perceptions of the role of expert testimony. The chapter reveals that factfinders are conscious of the limits of open source evidence and emphasize the need for corroboration in view of those limits. They consider the source of open source evidence, and their potential bias, as important in their assessment of the evidence. Expert testimony is also seen as crucial, although questions remain about who qualifies as an expert and what kinds of expertise are required in a rapidly-evolving field.

Keywords: judges, juries, open source evidence, credibility, bias, expert evidence

I. Introduction

As other contributors to this volume[2] have pointed out, open source evidence is central to our ways of knowing about human rights violations and atrocity crimes today. While the reality that open source evidence has been admitted in court and evaluated by factfinders is itself

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[2] See e.g. Lindsay Freeman, 'Prosecuting Atrocity Crimes with Open Source Evidence: Lessons from the International Criminal Court' and Alexa Koenig, ''Open Source Evidence and Human Rights Cases: A Modern Social History', both in this volume.

instructive, this chapter presents some unique empirical insights from both qualitative interviews with international judges and jury insights from a fictional trial to assess these factfinders' perceptions of open source evidence. We also refer to relevant case law that further illustrates the key themes throughout. Following a brief account of the methodology employed by the researchers in Part II, we structure our analysis across three key overarching themes that emerged from the data. In Part III, we discuss the perceived limits of open source evidence, both in terms of what it can show and in relation to the importance of corroborating evidence, as stressed by both professional and lay adjudicators. Part IV examines the issue of source credibility and the impact of missing information on the source of evidence, as well as the impact of perceived bias of the source. Our research has found that judges and juries do "centre the source", though perhaps not in the way envisioned by McAvoy and Kebriteh in their contribution to this volume.[3] Lastly, Part V analyses judge and jury perceptions of experts in the context of open source evidence, including who they perceive to be an expert in this context, the role of experts in litigation, and the impact of trust in experts on trust in the open source evidence that those experts have verified or analysed. Part VI concludes.

II. Methodology

This article combines insights from interviews with judges of the International Criminal Court (ICC) and a mock jury study conducted at Swansea University between March and September 2024. Three themes – the limits of open source evidence, the credibility of the source and the role of experts – were identified inductively through an analysis of interview transcripts and jury questionnaire data, using reflexive thematic analysis. [4]

The authors carried out interviews with 12 of 18 ICC judges between November 2022 and March 2025. At the time of interview, 11 of our interviewees were sitting judges, while one had recently retired. We recruited the judges, who represent a wide range of professional and personal backgrounds, via email. The majority of the interviews were conducted face-to-face at the ICC in The Hague.[5]

This article further draws on insights gained from a mock jury study, which involved a fictional criminal trial in a British court of a fictional pilot from the Saudi air forces, alleged to have

[3] Libby McAvoy and Haneen Kebriteh, 'Centering the Source in Open Source Investigations', in this volume.
[4] Victoria Clarke and Virginia Braun, 'Thematic analysis' [2017] 12 *The journal of positive psychology* 297.
[5] Four of the 12 interviews were carried out via Zoom (with Judges 4, 6, 9, and 11).

committed a "double tap" strike in Yemen. The video of the airstrike had been posted on Twitter (now X). An investigator from Bellingcat, the investigative organisation that verified the video, testified as an expert witness in the trial, which was presided over by a leading judge, Sir Howard Morrison KC. The prosecution and defence were represented by experienced practicing lawyers (Helen Malcolm KC and Joshua Kern for the prosecution and Peter Haynes KC and Kirsty Sutherland for the defence). The full trial (incorporating initial instructions from the judge; opening statement by the prosecution; examination and cross-examination of the expert; closing statements from each of the parties, and closing instructions from the judge) was recorded by a professional film crew. The entire trial totalled two and a half hours, and the resulting film was shown to 140 research participants at Swansea University (11 juries of 12 jurors each, with eight reserve jurors) across 2024.[6]

The aforementioned video served as a central piece of evidence. However, as would be the case in a real trial, several factors regarding the video were potentially problematic, as pointed out by the parties. The video's metadata had been stripped upon its upload to Twitter, and its creator was unknown. Moreover, the video was not the original version, but instead apparently consisted of two clips that had been spliced together, with the second half seemingly preceding the first in time. The journalist who had first shared the video online had shared predominantly pro-Houthi content to his account, suggesting potential bias. Lastly, the expert who testified on the authenticity of the video was a generalist open-source information expert and not a digital forensics specialist.[7]

As readers may be aware, criminal cases in England and Wales are tried by a jury of 12 laypeople, selected at random from the electoral roll. To conduct this study, a professional research company recruited a representative sample to reflect the likely composition of a jury in Swansea Crown Court across education levels, age, professions, and ethnicity.[8] The deliberations of the 11 juries were transcribed and linguistically analysed to uncover people's

[6] The mock trial video can be viewed in full on the TRUE project website: www.trueproject.co.uk and YouTube channel.

[7] For a detailed discussion of the mock trial scenario, and further information on the video and key arguments, see: Dearbhla Minogue, Siobhán Allen, Charlotte Andrews-Briscoe and Yvonne McDermott, 'Putting Principles into Practice: Reflections on a Mock Admissibility Hearing on Open Source Evidence' in Michael Lysander Fremuth, Andreas Sauermoser, and Konstantina Stavrou (eds), *International Criminal Law before Domestic Courts* (MANZ Verlag Viel 2024), which discusses an earlier mock *voir dire* (i.e. admissibility) hearing held in 2021 that centred on the same video.

[8] For more information about the demographic makeup of jury groups, see Yvonne McDermott Rees, 'Update on TRUE Project Jury Research', 15 November 2024: https://www.trueproject.co.uk/post/update-on-true-project-jury-research.

perceptions of the open source evidence and the related expert testimony. Jurors also completed brief pre-deliberation on their verdict preference and confidence levels and completed detailed post-deliberation questionnaires. The post-deliberation questionnaire covered a range of factors relating to the trial, the evidence, the parties, and themselves.

III. Themes

A. The Limits of Open Source Evidence

This section examines the limits of open source evidence as perceived by the ICC judges and mock trial jurors, focusing first on what a piece of evidence can show and then exploring the importance of corroborating open source evidence.

a) What it can show

Much has been written about the advantages of open source evidence, with scholars praising it for allowing investigators to overcome obstacles such as "governmental interference with investigations, inadequate security in the region, and delay-induced destruction and degradation of evidence".[9] It has also been noted for its ability to produce different categories of evidence, such as lead, contextual, linkage, or corroborating information;[10] for its democratizing potential, amplifying the voices of victims and witnesses who might otherwise not have been heard, allowing for the documentation of crimes that would otherwise have gone unnoticed;[11] and for being more immediate and arguably more objective than witness testimonies tend to be. A lot of those points were addressed in our interviews with ICC judges. Asked about their views on the benefits of user-generated evidence, content created on personal digital devices that is often posted online, the most common advantage noted (by five judges) was that it provides a visual real-time account of the crime. Considering that user-generated evidence can provide this real-time account of events, four interviewees mentioned that it could replace some witness testimonies, thus possibly reducing the costs and length of trials.

We were keen to learn more about how judges thought about the limits of open source evidence, what it can and cannot show, and whether a piece of user-generated evidence can stand on its

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[9] Nancy Amoury Combs, 'Deconstructing the Epistemic Challenges to Mass Atrocity Prosecutions' [2018] 75 *Washington and Lee Law Review* 223, 245.

[10] Daragh Murray, Yvonne McDermott, and Alexa Koenig, 'Mapping the Use of Open Source Research in UN Human Rights Investigations' [2022] 14 *Journal of Human Rights Practice* 554, 558 and 561; Iva Vukušić, 'Nineteen Minutes of Horror: Insights from the Scorpions Execution Video' [2018] 12 *Images and Collective Violence: Function, Use and Memory* 35, 46.

[11] Murray et al., *ibid*. Internet coverage remains patchy in many parts of the world, including those affected by ongoing armed conflicts, and access to smartphones and the required technological savviness to produce a piece of user-generated evidence that will stand in trial are not (yet) universal.

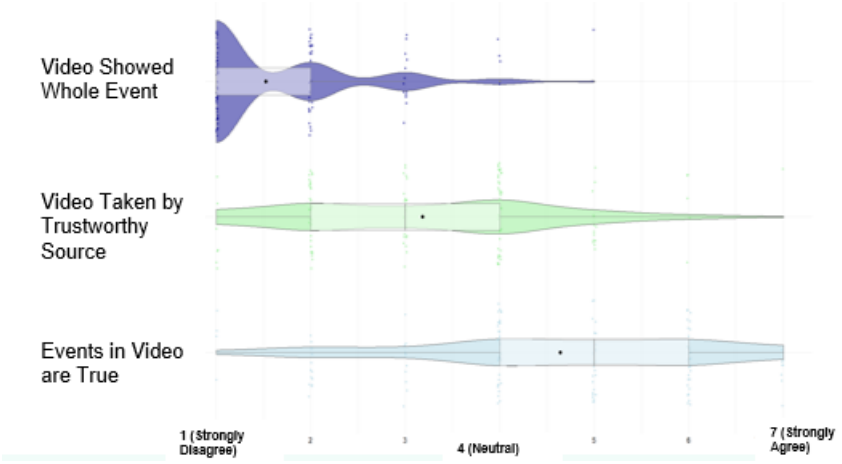
own as proof of fact. Judges seemed very aware that user-generated evidence is subjective and can almost always only present one – potentially purposefully designed – version of events. One of them reminded us that:

> the video can be only part of the whole […] thing. You know, you can also take a video of what you need for your own position, and then you stop. And when it comes, when you are attacked, you make the video. And when your party counterattacks, you don't, you know, make it, you know. You never know what, what's before and after the video, you know?[12]

We were also curious to see how ordinary people felt about open source evidence, including whether a piece of open source user-generated evidence can provide an accurate depiction of events. Asked about how confident they were that the events shown in the video were accurate, jury responses were extremely varied (M = 4.08; SD = 1.67).[13] The majority of jurors (M = 5.82; SD = 1.36) agreed that the person who captured the video wanted to make them feel a certain way about the topic.

The importance of the source of the video was emphasised by defence counsel in our fictional trial. Given that the account that first posted the video in question was known to post content only favourable to one side of the conflict, the defence challenged its reliability. The prosecution, on the other hand, acknowledged the bias of the source but claimed it was countered by the expert's independent verification of the video.

[12] Judge 11.
[13] Jurors were asked to indicate how accurate they believed the video was on a scale from 1 (very inaccurate) to 7 (very accurate).



Graph 1: Jurors perception of the video's accuracy, and credibility.

Asked about any factors that undermined the credibility of the video, jurors remarked on the incompleteness of the evidence and the fact that the video did not depict the whole event. Jurors also felt the creator of the video had an "intent of emotional persuasion"[14] and was potentially trying to push an agenda by combining the two segments into one video clip.[15] One juror stated that "[t]he fact that the 2 sections were put round the wrong way made me feel like they were trying to manipulate us. Any credibility was lost and it became confusing to know the truth."[16] Other jurors felt similarly, posing that the person who had uploaded the video had inverted "the timeline of two videos to create a particular narrative"[17] and that the video was "only showing you what they want you to see."[18]

The responses in the post-deliberation questionnaires further reveal that jurors questioned what the video did not show. In addition to having been spliced, the video was just two minutes and 20 seconds long, due to the time limit Twitter imposed on video uploads at the time. Most jurors felt like the video did not depict the whole event (M = 1.52; SD = 0.85). Several jurors remarked on the length of the video, with one person wondering whether the person who shared the video had intentionally chosen Twitter for its restrictions on the video time.[19]

In terms of gaps in open source evidence, ICC judges were mindful that a video might depict an offence being committed but might not necessarily reveal who bears responsibility.[20] This

[14] Jury 2, Juror 1 (18-24 age group, female).
[15] Jury 2, Juror 5 (25-34 age group, female).
[16] Jury 3, Juror 9 (35-44 age group, female).
[17] Jury 4, Juror 12 (55-64 age group, male).
[18] Jury 4, Juror 2 (35-44 age group, male).
[19] Jury 2, Juror 8 (65-74 age group, female).
[20] Judge 5.

problem arose in the Swedish case against *Al Amin Sultan and Hassan Al-Mandlawi*. In that case, the defence for Al Amin Sultan had questioned whether it was really the defendant that was depicted in a video central to the case. They noted that it was quite common to borrow someone else's clothes and shoes, to explain why the person depicted in the videos wore the same clothes as Al Amin Sultan.[21] Defence counsel posed that "[i]n the absence of a crime scene investigation, the names of the victims and DNA evidence, the defendants have questioned whether the evidence presented by the prosecution is sufficient to establish beyond reasonable doubt that they are on the murder films."[22] Ultimately, as discussed below, the court was satisfied that the video depicted the defendants.

In another Swedish trial, the Stockholm District Court, in evaluating photographs and videos in the case against *Mohammed Hamo*, stressed that the visual evidence

> gives a momentary picture of what has happened in various areas on the ground. This evidence can then support other more direct evidence about an event, but cannot, as a general rule, alone prove that an event occurred at a certain time and place and who acted at that time.[23]

The Swedish authorities had charged the defendant with aiding and abetting serious crimes, specifically indiscriminate attacks on civilian populations. He was acquitted on all counts, due to the lack of sufficient evidence that his division had been involved in the attacks.

b) Importance of corroboration

We were interested in how judges view the need for corroboration when dealing with open source evidence. Considering that few of the interviewees had previously dealt with open source evidence in their cases, the question was, of course, quite theoretical, and our interviewees were all quick to stress that the need for corroboration will always depend on the evidence at hand and the specific case in question.

We did, however, notice differing attitudes among our interviewees regarding the need for corroboration when relying on open source evidence, particularly user-generated evidence. Seven out of twelve judges stated that the need for corroboration depends on the piece of evidence and what it has been presented to show, and that corroboration is not necessarily

[21] *Prosecutor v Al Amin Sultan and Hassan Al-Mandlawi*, Gothenburg District Court, B 9086-15; B 5306-15 (14 December 2015) author's own translated version of the judgement, p. 12.
[22] ibid p. 22.
[23] *Prosecutor v Mohammed Hamo*, Stockholm District Court, B 5459-23 (20 June 2024) translated judgement, p.37.

required. Three judges (Judges 1, 9 and 12) opined that corroboration through other open source evidence is difficult, noting that "to go and rely on a Twitter feed alone to determine guilt beyond reasonable doubt, it's just going to be very difficult"[24] and that "a piece of photo evidence cannot, or video evidence to my mind cannot, corroborate the next, whether it's two or three" pieces of content.[25] They specified that further evidence would be needed as proof that a person depicted in a video was actually present at the scene of a crime.[26] Judge 12 was very clear in stating that they "don't believe that you can fully evaluate a piece of evidence in isolation" and that "corroboration is key". They remarked that judges are not trained IT technicians, and are thus not always able to spot fake or manipulated content.[27] Another judge also addressed the risk of manipulation, mentioning alteration and corruption of content, as well as deepfakes to underscore the need for corroboration.[28] Even when a piece of evidence cannot be corroborated, a judge might still be able to determine whether it is reliable and authentic, but the opposing party may seek to undermine the reliability and authenticity of the evidence by referring to the absence of corroboration.[29]

Other interviewees noted that the ICC Statute does not require corroboration,[30] and that the need for corroboration "depends on the importance of the document".[31] Other relevant factors are whether the source is known,[32] what is known about its provenance,[33] the type of incident depicted,[34] and whether the item could be authenticated.[35] In general, judges were cautious about relying too heavily on a piece of user-generated evidence without any corroborating evidence, reminding that "at the end of the line, you have to decide if to send somebody to jail for 30 years […]. So the more sources, the more different the sources are, the better it is."[36]

In the mock jury study, the trial centred on one open source video that purported to show a double-tap airstrike, and was a particularly important piece of evidence for the prosecution.

[24] Judge 1.
[25] Judge 9.
[26] Judge 1.
[27] Judge 12.
[28] Judge 9
[29] Judge 1.
[30] Judge 6.
[31] Judge 4.
[32] Judge 4, and Judge 8.
[33] Judge 12.
[34] Judge 4.
[35] Judge 6: "Especially such kind of, kind of documentary evidence, photo or video, if there is no problem with authentication, that can be easily used for what happened in this specific time and place, that can be done easily without any problem."
[36] Judge 11.

Ultimately, nine out of 11 juries found the defendant not guilty of the war crime of intentionally directing an attack against civilians. We asked jurors in the post-deliberation questionnaires to note the extent to which the video had impacted their verdict in the case, and to note any factors that undermined the credibility of the open source video that the case had focused on. Jurors posited that there was "not enough evidence or any witnesses to truly corroborate the video with the time, date, place & person",[37] that the evidence had been "very heavily dependent on the one video",[38] and that there was "not enough evidence to prove beyond reasonable doubt there was intent".[39]

An examination of the case law from domestic courts confirms the judges' and juries' perceptions that it is unlikely that a single piece of user-generated evidence, including open source user-generated evidence, will be sufficient to prove a fact without any corroborating evidence. Several cases exist in which a video or photograph played a key role; however, we have yet to come across a case in which there was *no* corroborating evidence in support of that piece of content, whether in the form of witness testimonies or other pieces of documentary or physical evidence.[40]

One notable case involving open source evidence is that against *Ahmad Al-K.*, who was found guilty of complicity in the killing of a person placed *hors de combat* by captivity. Central to the case was an interview the defendant had given to *The Guardian* newspaper, in which he identified himself as commander of the fighting group Ghuraba'a Mohassan. Evidence further included a video depicting the defendant executing a Syrian soldier, which the Dutch authorities had found online.[41] The video had been filmed by Sami A.S., who was tried in

[37] Jury 5, Juror 3 (25-34 age group, non-binary).
[38] Jury 1, Juror 12 (45-54 age group, male).
[39] Jury 5, Juror 4 (18-24 age group, female).
[40] The only exception was the ICC arrest warrant for Mahmoud Mustafa Busyf Al-Werfalli, for the war crime of murder in seven incidences against 33 persons. The ICC based the arrest warrant on videos that had been posted on Facebook and other platforms. The accused passed before the trial began, so the evidence was never challenged. Warrant of Arrest, Al-Werfalli (ICC-01/11-01/17), 15 August 2017, §§ 11–22; Second Warrant of Arrest, Al-Werfalli (ICC-01/11-01/17), 4 July 2018, §§ 17–18.
[41] *Prosecutor v Ahmad Al-K.*, The Hague District Court, Case No. 9/748001-19; 22-002229-21 (16 July 2021). Ahmad Al-K. was charged with having committed the war crime of killing a person hors de combat, and participation in a terrorist organisation, and arrested on 21 May 2019. On 16 July 2021, the Hague District Court found Ahmad Al-K. guilty of complicity in the killing of a person placed hors de combat by captivity, committed in a non-international armed conflict, but acquitted him of the charge of having participated in a terrorist organisation (Jabhat al Nusra) due to a lack of evidence. He was sentenced to 20 years imprisonment. On 14 November 2023, the Hague Court of Appeal upheld the acquittal for membership in a terrorist organisation, but ruled that the battalion in which the defendant held a leading position qualified as a terrorist organization. The sentence was thus increased to 23 years and 6 months imprisonment.

Germany.[42] Two further videos, both depicting the same scene, were found in the course of the investigation, one being retrieved from YouTube by the Dutch police, and the other one found by the German police on a CD-ROM in the home of a suspect. Evidence that led to Ahmad Al-K.'s conviction consisted mainly of user-generated evidence, including the three videos of the execution (two of which were open source), the *Guardian* article, content the defendant's son had posted online, and other online videos.

In the Swedish case against *Al Amin Sultan and Hassan Al-Mandlawi*, the co-defendants were found guilty of terrorism crimes.[43] The evidence against the defendants included three videos, which showed the preparation of the execution of two men (video 1), and the execution of the two men (videos 2 and 3). The videos were stored on a USB drive that was found during a search of Al Amin Sultan's home. The three videos were central to the case, and were corroborated by photographs found online, as well as by witness testimony.

In its judgement in the case of *Al Hassan*, the ICC Trial Chamber noted the defence objection to videos that had been tendered by Prosecution.[44] Despite the videos having been edited and not being the original versions, the Trial Chamber still found them reliable as they were corroborated by other videos showing the same scenes from different angles. The geolocation analysis of an investigator "who independently identified the likely location at which the videos were filmed" was also considered.[45] Taken together, these examples highlight the need to corroborate open source evidence and to be mindful of the limits of what it can show.

B. Source credibility

Considering that ICC case law provides little guidance on the factors that judges should consider when evaluating the admissibility or weight of open source evidence, our interviews provided some unique insights. Judges and jurors both emphasised the importance of the credibility of the source of the evidence, and any bias that a source might exhibit. Our data also

[42] Sami A.S. had worked as media propaganda specialist with Ghuraba'a Mohassan. He filmed the killing and commented on it whilst filming, expressing his support of the killing, but took no active part in the execution or the planning of the execution. Sami A.S. was found guilty of having aided and abetted the killing of the victim as a war crime, and having aided and abetted murder as an ordinary crime, and having supported a terrorist organsation through his filming activities, and sentenced to nine years in prison. Co-defendant Khedr A.K. was found guilty of having been co-perpetrator in the killing of the lieutenant colonel as a war crime, murder as an ordinary crime, and membership in a terrorist organisation and sentenced to life imprisonment. *Prosecutor v Sami A.S. and Khedr A.K.*, Higher Regional Court of Düsseldorf, Case No. 6 StS 2/20 (26 August 2021).
[43] *Hassan Al-Mandlawi and Al Amin Sultan* (n20).
[44] *Prosecutor v Al Hassan Ag Abdoul Aziz Ag Mohamed Ag Mahmoud*, Trial Judgement, ICC-01/12-01/18 (26 June 2024) fn. 3458.
[45] *Id.*

demonstrates the consequences that can result when the source of a piece of evidence is unknown.

a) Source bias

Four of the ICC judges we spoke to brought up the issue of potential source bias of a piece of user-generated evidence. Judge 11 was particularly concerned about the reason why the source decided to capture a specific incident, remarking that an image or video does not "speak for itself" and that the person capturing a scene might have filmed selectively and stopped at a critical moment to create a certain narrative. The judge stressed that the motives, relationships, and potential biases of the source might impact the reliability of the evidence, and that user-generated evidence should be considered in its broader context, which includes identifying who created it and why. Judge 11 further stated that when assessing the credibility of a piece of user-generated evidence, "the assessment has to be much more deep" than when dealing with other types of evidence. They noted that video recordings might only show the moments that the person recording the scene wants to capture, making it difficult to understand what happened before or after the footage.[46]

Other judges also underlined the importance of questioning what motives the source had to capture a specific scene, who they are, and whether they have "an obvious bias".[47] Judges acknowledged that bias of the source should always be considered, but not necessarily assumed.[48]

The bias of the source was also brought up by several of the jurors who participated in our mock jury study. Jurors wondered whether the person who had created the video was potentially biased, and which motives they had for capturing the video. Several jurors expressed concerns that the person who captured the video had been biased, worrying that the source was trying to push an agenda; that the video had been posted by a Houthi supporter (as emphasised by defence counsel in cross-examination of the expert); that the source had an "intent of emotional persuasion";[49] and worried that the video was biased as it had all been captured by the same person and was "biased filming".[50]

[46] Judge 11.
[47] Judge 2. Judges 7 and 9 also highlighted the importance of examining the motives of the source.
[48] Judge 7.
[49] Jury 2, Juror 1 (18-24 age group, female).
[50] Jury 7, Juror 8 (45-54 age group, male).

Jurors distinguished between the person who recorded the video and the person who had uploaded it. One juror opined that "[t]he person recording it is unknown. The person who posted it is biased. It has clearly been edited to make the public think a certain way."[51] Jurors stated that they "do not trust the motives of the person posting the video",[52] that they were doubtful of the video's reliability because of the "biased opinion of the person uploading the video as to who they support",[53] and that they felt that the person who had uploaded the video was neither neutral nor reliable.[54]

b) Source unknown

The person who originally created a piece of open source evidence will often not be known, as content might be reposted or have been shared in private communications and then posted online. In addition, the content's metadata may be stripped upon upload to social media platforms, making it more difficult to determine where and when it was captured, and on what device. We thus wanted to explore how judges and jurors approach cases in which the original source of the evidence is unknown.

All ICC judges agreed that knowing the identity of the creator significantly enhances the credibility of the evidence. In the words of Judge 2, a key instinct among judges is to ask "who actually generated this?" and "what do we know about them?".[55] The majority (10 Judges) believed that a piece of user-generated evidence could still be admissible even if the source was unknown, especially if it could be corroborated through other evidence, such as witness testimony. Judges 8 and 11, however, appeared hesitant at the prospect of admitting a piece of open source user-generated evidence when its source is unknown.[56] Judge 11 was especially concerned about admitting a piece of evidence when it is unclear whether it is the original version, or if other versions exist.[57] For this judge, knowing the identity of the source is

[51] Jury 6, Juror 3 (25-34 age group, female).
[52] Jury 6, Juror 12 (55-64 age group, female).
[53] Jury 7, Juror 8 (45-54 age group, male).
[54] Jury 5, Juror 11 (55-64 age group, female) ("Not a reliable and neutral source i.e. BBC or credible journalist").
[55] Judge 2.
[56] Judge 8 posed that "Because the courts also realise that it's, it can be difficult to get evidence in, in these international crimes. Because they are usually committed... the victims, some are dead, the witnesses are threatened, some are killed. So that's, I think that is even why they say we can admit hearsay evidence. We have jurisprudence that allows us to admit hearsay evidence. As long as some, some people can say yes she told us before she died that is what happened, and you believe the witness who said it, you can learn that evidence because of the difficulty of getting first hand evidence."
[57] "Well, first of all, I want to see the source, who is the person. Because one has to, is responsible for it. Okay. So that's why, for example, I do not like, I do not consider as evidence, the NGO reports. The Human Rights Watch reports when they say, well, we have questioned the victims and they told us this and this and that. And when I ask who are the victims? Well, I don't know. For me, I know them, but I don't tell you. Well, for me, they are not

elemental for assessing the credibility and reliability of a piece of evidence. They cautioned that the evidence could be manipulated, and that they would not convict someone based on such a piece of evidence.[58] Judge 8, too, believed that "it would become very difficult" for the ICC to rely on a piece of evidence when the source is unknown, as the evidence could then not be fully authenticated. The judge added that it would be a different situation if a video was live streamed online, and other videos existed to corroborate the content.[59]

The other judges were open to admitting a piece of evidence from an unknown source as long as there was corroborating evidence to speak to the claims being made by the user-generated evidence.[60] Judge 2 told us that they would rely on things like metadata, geolocation, and chronolocation to verify open source evidence if the source was not known.[61] Additionally, judges considered that (open source) user-generated evidence would be admissible if an expert could potentially speak to the authenticity of the evidence, and there were no clear signs of manipulation.[62] Judge 5 also underscored that the stage of proceedings matters, as a lower threshold would apply at the confirmation stage pre-trial ("substantial grounds to believe") versus the more rigorous approach at trial.

In response to a question on how they would deal with a scenario in which two videos, both depicting the same scene but taken from different angles, were tendered as evidence without the sources of the videos being known, one judge stated that if those were "two videos that just happened to have popped up on the internet, then we have nothing."[63] Further evidence and examinations, such as forensic investigations of the crime scene, would be required to ensure that the content was not staged, and that the facts occurred as depicted in the videos.[64] This sentiment was shared by judge 9, who stated that "a piece of photo evidence cannot […] to my mind cannot corroborate the next" due to the risk of having been manipulated.[65]

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existing. What Human Rights Watch says, from that moment on is not existing as evidence. I make take it into account for the, you know, you know the, when I consider the environment in which things happen, of course. But it's not, technically speaking evidence, because I would have to know the names of source, to question myself and then to evaluate the credibility. So, first of all, the source. Which is the most important thing."

[58] Judge 11: "But it was a video taken from a mobile phone. Okay. And we didn't know who took the video, whose telephone it was. So this is a big problem... and we didn't even know if we had the original, or a copy, so that we didn't we couldn't even make a test if it was somehow manipulated. So what do you do? Do you convict somebody to 20, 30 years in jail because of evidence like this? Not me in any case. So maybe others. I don't."

[59] Judge 8.

[60] Judge 1, Judge 2, Judge 6, Judge 7, Judge 9, and Judge 12.

[61] Judge 2.

[62] Judge 6 and Judge 7.

[63] Judge 1.

[64] Judge 1.

[65] Judge 9.

Jurors partaking in our mock jury study were asked, *inter alia*, what factors they thought contributed to and what factors undermined the credibility of the video they were shown. The majority of jurors noted that the video simply appeared realistic, remarking on the "gory violence" of the scene depicted,[66] the screams and noises,[67] and the shaky camera.[68] This aligns with our large online studies, where "photorealism" (e.g. shaky camera footage) appears to enhance the perceived reliability of open source evidence.[69] Jurors also said that the video did not seem staged, and that the expert witness's testimony had convinced them that the video depicted what it purported to show. One juror noted that the video "[d]id not appear to be staged. No AI involved due to the date the video was taken",[70] as the video showed an attack that occurred in May 2018, prior to many more recent advances in "deepfake" technology.

Regarding the factors that undermined the video's credibility, 16 jurors specifically noted that the source was unknown. They were unsure whether the source could be trusted, and two jurors even wondered whether the video had been taken by one or two individuals.[71] Jurors mentioned the fact that the source did not testify in court.[72]

The Dutch District Court in The Hague faced similar questions surrounding the admissibility of a video from an unknown source in the case against *Ahmad Al-Y*. Judges had to consider whether a video should be dismissed as the creator and uploader of the video and the date and place it had been filmed were unknown, and it was unclear whether the footage was complete.[73] In authenticating the video, the Dutch police had been able to identify "the unique ID number, upload date, and upload time of the video" which was actually a compilation of five different videos.[74] Those individual videos could not be found elsewhere on the internet. The fact that

[66] Jury 5, Juror 3 (25-34 age group, non-binary).
[67] Jury 5, Juror 1 (18-24 age group, male), Jury 7, Juror 9 (55-64 age group, female).
[68] Interestingly, one juror felt that the video did not contain "much jump" to the handheld video. Recamera. Not much "breathing air either". Another one thought the video looked staged, stating that "there did not seem to be enough panic among the onlookers. Looked staged." Jury 3, Juror 10 (55-64 age group, female).
[69] Alice Liefgreen, Gabriella Jiga-Boy, and Yvonne McDermott, 'Epistemic Vigilance in Action: Default Strategies for Evaluating the Trustworthiness of Conflict-Related User-Generated Content Online' (under review; on file with authors).
[70] Jury 11, Juror 4 (65-74 age group, male).
[71] "No idea who filmed it/was it the same person, no timings etc. Person who posted on Twitter gave a very personal + person influential account of are affected/no. casualties etc." Jury 1, Juror 7; "As above, the edit, we don't know who is in the video - are they civilians or undercover? Who took the footage? 1 person or 2 separate people? Also why film someone lying in rubble, there was no urgency to try to rescue them → footage then appears more drastic." Jury 4, Juror 3 (25-34 age group, female).
[72] Jury 2, Juror 7 (45-54 age group, female): "[a]bsence of author/videographer evidence/presence in court".
[73] *Prosecutor v Ahmad Al-Y*, The Hague District Court, Case No. 09/748011-19 (21 April 2021).
[74] *Prosecutor v Ahmad Al-Y*, The Hague Court of Appeal, Case No. 2200128321 (6 December 2022) Appeal Judgement, translated judgement, p.13.

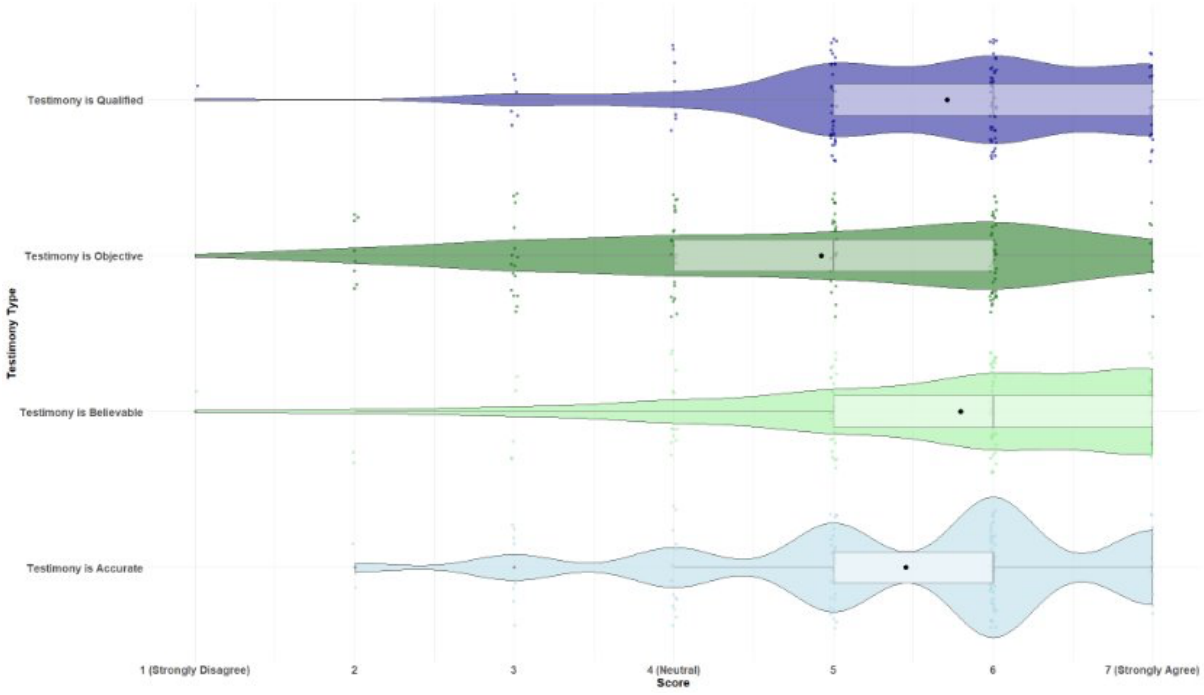
the video was uploaded on or shortly after the day of the depicted incident was interpreted by the Court as indicating that the open source video was "original". The Court noted that "[a]lthough manipulation of the footage is always borne in mind, in the case of video 1 there was no reason to suspect that the video had been edited (the Court of Appeal understands: other than it being a compilation and that the logo was added), as in the case of 'false context' or 'manipulated content'."[75]

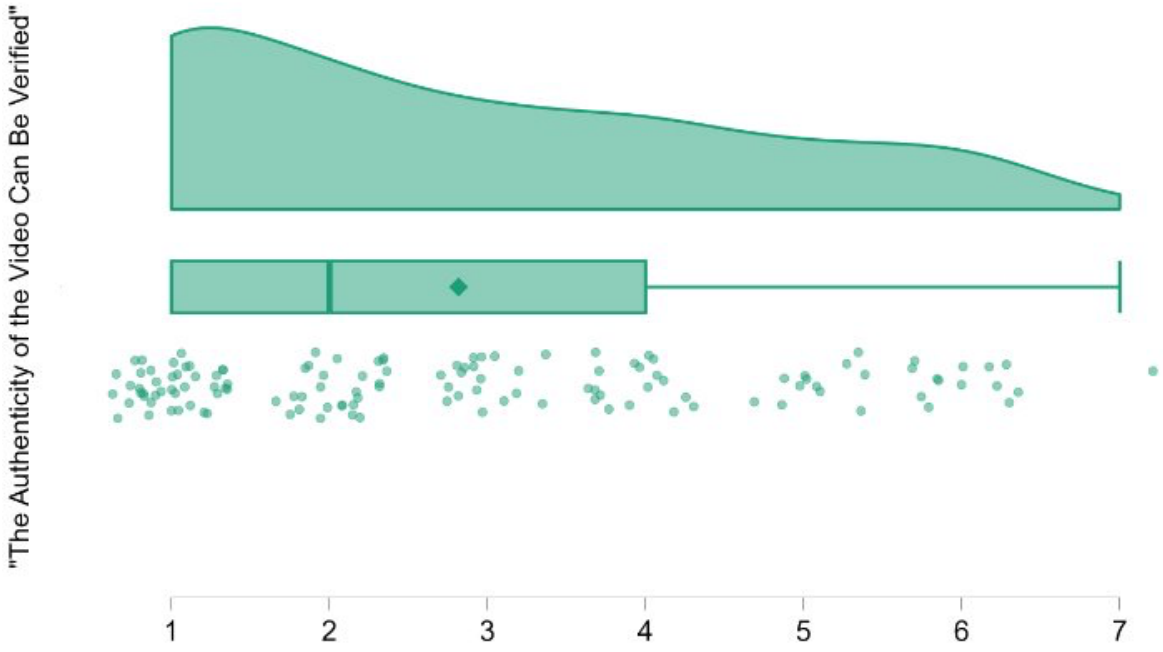
The case against Ahmad Al-Y, as well as the insights from our interviews and mock trial reveal that judges and jurors are able and willing to approach open source evidence with some flexibility and creativity. While the fact that the source is unknown, or is known but has a particular bias, will be taken into account when assessing open source evidence, these are not fatal to its perceived credibility, especially if other corroborating evidence is on record.

C. The evaluation of expert testimony

In our mock trial, the prosecution's case was that the fact the source was unavailable to testify was remedied by the expert witness's expert verification of the open source evidence, which pinpointed the time, date, and location of capture of the video. This is a view that has been posited many times.[76] However, our jury questionnaire data would appear to call into question that assumption. Our jurors rated the expert witness, Nick Waters, as highly "qualified" (M = 5.71; SD = 1.14), "believable" (M = 5.79; SD = 1.28), "accurate" (M = 5.45; SD = 1.24), and "objective" (M = 4.92; SD = 1.49). Nevertheless, when asked to rate the statement that "the authenticity of the video can be verified", jurors tended to disagree (M = 2.81; SD = 1.72).

[75] *Ahmad Al-Y* (n71).
[76] See for instance the reports issued by GLAN: https://www.glanlaw.org/oosi-reports; Jonathan W. Hak, *Image-Based Evidence in International Criminal Prosecutions* (Oxford University Press 2024) 271.





Not shown are 1 observations due to missing data.

Points are slightly jittered from their true values.

By contrast, ICC judges tended to put a lot more emphasis on the importance of experts than our juries did, perhaps because of their extensive experience with other types of evidence and

expertise.[77] Judge 1 noted that "you have to undergo forensic examination of everything… because you need to authenticate evidence to validate the elements for the evidence and the facts that the evidence appears to show." On the other hand, both Judges 2 and 5 noted that expert analysis would usually be needed if other aspects of the content (e.g. its time and date of capture) were unknown. Judge 7 posed that the parties tend to call expert testimony to bolster their case in any event. As such, they did not think expert evidence was strictly necessary, but deemed it important:

> if there [are] questions about its having been created or having been doctored. That, I think, is a very real concern because we see so much of that on the internet, and so this is where the experts would play the role as to how much they can tell us about, you know, editing and photoshopping and all those kinds of things. That's where I think that expert evidence would be very important…. If you're using a sensible, common sense kind of approach, then there's no danger that someone's just going to stand up and say, "oh this is a deepfake… therefore we should disregard it." No, I think we would be much more prudent on something like that. But there we would need experts, obviously, some expert can detect this kind of thing.[78]

Much has been written on the type of expertise that is required, and who might qualify as an expert in the context of open source investigations.[79] Domestic cases have tended to use national forensic institutes to assess the authenticity of content.[80] For example, in the Swedish case of *Al Amin Sultan and Hassan Al-Mandlawi*, the National Forensic Centre (NFC) authenticated three films and was reported as considering "the results of their analysis to be extremely strong evidence that the three films show different parts of the same sequence of

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[77] Judge 4 (noting that historians and sociologists have testified before the Court); Judge 3 (noting that investigators have testified in international criminal law cases about how evidence was obtained). See also Judge 9 ("Well, then as to how, you know, the evidence goes to court, you just need an investigator who works for the prosecution's office. That doesn't need to be an expert. That person can come and say, you know...who I mean, how, during which investigation ...the statements of witnesses really show how the investigators approached them."). Compare Judge 5 ("You know, it, it depends on what is being presented, really. If it is pictures that have been taken by an investigator, then the investigator usually needs to present it himself. But if it's something like these, like, for example, transcripts of a conversation which was had or you know, people can talk about the system, how it worked, who transcribed it, how it was stored. And you know, in that case, I don't think it's necessary that the actual transcriber or whatever needs to present the evidence. As long as some reliability of the source can be established, I think the court would be able to rely on it.") See also Judge 11 (noting that the report of an investigator might be sufficient; in-court testimony will not always be required).

[78] Judge 7.

[79] Matthew Gillett, and Wallace Fan, 'Expert Evidence and Digital Open Source Information – Bringing Online Evidence to the Courtroom' [2023] 21 *Journal of International Criminal Justice [JICJ]* 661; Alexa Koenig, and Lindsay Freeman, 'Cutting-Edge Evidence: Strengths and Weaknesses of New Digital Investigation Methods in Litigation' [2022] 73 *Hastings Law Journal [Hastings L.J.]* 1233; Minogue et al. (n6); Asymmetrical Haircuts Podcast, "Episode 42 – Social Media on Trial with Yvonne McDermott Rees and Karolina Aksamitowska" (26 May 2021) https://www.asymmetricalhaircuts.com/episodes/episode-42-social-media-on-trial-with-yvonne-mcdermott-rees-and-karolina-aksamitowska/

[80] Karolina Aksamitowska, 'Digital Evidence in Domestic Core International Crimes Prosecutions' [2021] 19 *JICJ* 189.

events."[81] The NFC also concluded that the films were "most likely not manipulated."[82] The District Court noted, "In light of the NFC's expert opinion, the District Court considers that there is no reason to question the authenticity of the films."[83] This perhaps demonstrates a common tension with expert evidence of all kinds, which is the degree of deference to be shown to experts, in light of the fact that the ultimate responsibility for assessing the evidence remains with the factfinder.[84] One of the ICC judges noted this, stating that, while experts can shed light on particular issues, "at the end of the day, the results of the expert cannot bind the judge, the judge should work with his [or her] own conviction to say that I'm convinced that this is that important."[85]

Domestic courts have generally shown a high degree of deference to experts, which have come from specialised police units[86] or national forensic institutes.[87] The national cases also demonstrate novel forms of expertise, ranging from "voice analysis",[88] "face comparison study",[89] and "photo comparison".[90] Unlike adversarial systems that have relatively strict rules on who can be deemed an expert and on the admissibility of expert evidence tendered by the parties,[91] experts in civil law jurisdictions tend to be appointed by investigating judges, meaning they are an expert of the court, not of either of the parties.[92] This was a fact noted by

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[81] *Hassan Al-Mandlawi and Al Amin Sultan* (n20) p. 7.
[82] ibid., p. 22.
[83] ibid., p.31.
[84] E.g. Joseph S. Miller, and Ronald J. Allen, 'The Common Law Theory of Experts: Deference or Education?' [1993] 87 *Northwestern University Law Review* 1131.
[85] Judge 4.
[86] *Prosecutor v Abdalfatah H.A., Abdoulfatah A., Abdoulrahman A.A. and Abdul Jawad A.K.*, Higher Regional Court of Stuttgart, Case No. 5-2 StE 5/17-4 (13 January 2020): "The fact that the video actually shows the defendant HA is ultimately also supported by the convincing expert opinion of the expert witness Police Chief Inspector ... from the Forensic Institute of the Baden Württemberg State Office of Criminal Investigation. In view of the expert's specialist knowledge, which was presented in the main hearing and also came to light, as well as in view of the comprehensibility and transparency of his expert opinion, the Senate has no doubts about the correctness of the content of his expert opinion.". See also *Prosecutor v Abdelkarim El B.*, Higher Regional Court of Frankfurt, Case No. 5-3 StE 4/16 – 4 – 3/16 (8 November 2016) (police expert on phone communication).
[87] *Prosecutor v Kurda Bahaalddin H. Saeed,* Örebro District Court, Case No. B 1662-18, B 6072-18 (19 February 2019): "The National Forensic Centre (NFC) has examined the photograph and has confirmed that it was taken in Al-Wahda on the same day as the photograph in paragraph 2."; *Ahmad Al-Y* (n71) (citing the evidence of the National Forensic Institute).
[88] *Hassan Al-Mandlawi and Al Amin Sultan* (n20).
[89] *Ahmad Al-Y* (n71).
[90] *Abdalfatah H.A. et al.* (n84).
[91] See e.g. *Frye v. US* (1923) 293 F. 1013; *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1993) 509 U.S. 579; United States Federal Rules of Evidence (as amended on 1 December 2024) Rule 702; Criminal Procedure Rules 2020 No. 759 (L. 19) in England and Wales; see further Minogue et al. (n6) and Rebecca A. Delfino, 'Deepfakes on Trial: A Call to Expand the Trial Judge's Gatekeeping Role to Protect Legal Proceedings from Technological Fakery' [2023] 74 *Hastings L. J.* 293.
[92] See e.g. Criminal Procedure Code of the Kingdom of Netherlands (1926, as amended 2012) ss. 227-236. Of course, the duty of experts in adversarial systems is to the court, not to the party who has instructed them.

one of the ICC judges we interviewed.[93] Judicial training will be needed to evaluate these new forms of expert analysis,[94] as will vetting of experts to avoid the issues of "junk science" that have plagued the domain of expert evidence in domestic jurisdictions in recent years.[95] ICC judges were mindful of the need for recognising new forms of expertise in which there may not be formal training or qualifications, but which still shed light on a matter outside of the knowledge of the judges.[96] In the words of Judge 7, "it doesn't have to be something where you have an education in it… in some instances I think an even better expertise [is] just that practical experience [of conducting a particular form of analysis] over and over again."

Corroboration will also play a key role. In one Dutch case, the Netherlands Forensic Institute indicated "a low magnitude of evidentiary value" for its comparative examination of the face of a person depicted in a video with photographs; the Court "thus corroborated the findings with witness testimony."[97] This example shows both the importance of independent experts who are comfortable with conveying uncertainty in their findings, and of other corroborating evidence. In our mock trial, some other evidence was provided, including a statement of a doctor who treated casualties on the day of the alleged attack (which corresponded with the expert's estimation of the time of the attack), and an interview provided by the accused in police custody. Universally, however, the jury groups paid little or no attention to this additional evidence, choosing instead to focus almost entirely on the open source video that was presented as a central piece of evidence in court, and the expert testimony that accompanied it. This suggests that lay decision-makers may need to be guided closely and reminded to consider all the evidence holistically, and that lawyers may need to be mindful of the particular cognitive

[93] Judge 12 ("In the civil law system, you have a system of experts who are experts of the courts, parties who are on the list, who have been vetted, who have been working usually with courts for years and years… In the common law system, you rely more on expert of the parties and it's [a] fact that you have experts on both sides that basically should lead you to the truth. I don't think there is one model that is better than the other.")
[94] ibid ("in order to make an assessment, judges need a minimum of knowledge of the field so I think training is important").
[95] ibid ("I think there should be some recognition type of process of the qualifications and experience."); on "junk science" in the courts, see David E. Bernstein, 'Junk Science in the United States and the Commonwealth' [1996] 21 *Yale Journal of International Law* 123; Executive Office of the President, President's Council of Advisors on Science and Technology, Report to the President: Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods (2016) https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf (noting insufficient foundational validity of certain new types of expertise, such as bitemark analysis).
[96] Judge 9: "You know, because of the fact that, you know, some of us, most of us Judges, you know, although we read widely, but when it comes to these technical issues, you may need an expert really to come and talk… I mean, to just to explain how something, information was gotten from this kind of evidence. And so it will be an expert who has the know-how - a technical expert…"
[97] *Ahmad Al-Y* (n71).

processes that may come into play when jurors are presented with visual open source evidence.[98]

IV. Conclusions

These selected insights of judge and jury perceptions of open source evidence highlight some key aspects that parties need to bear in mind when presenting or challenging such evidence in court. First, factfinders will rightly be aware of the limits of open source evidence, both in terms of gaps or incompleteness in what it can show,[99] and the need for other corroborating evidence considering these limits. Second, the source of the open source evidence seems to be an important factor for both lay and professional factfinders in their evaluation. Where the source has a known bias or has demonstrated a sympathy for, or particular animus against, one of the parties to a conflict, that may weigh on their minds. Where the source is unknown, expert verification may go some way to independently authenticating the footage, as demonstrated by numerous domestic cases. However, our jury study suggests that lay adjudicators may not deem a piece of open source evidence capable of verification, despite finding that an expert is qualified and credible. This "verification gap" is something that we will explore in more depth in future empirical studies.

Lastly, the role of experts, and what kind of expertise will be required by factfinders, is a crucial factor to consider. Given the ever-expanding field of open source investigation, some practitioners have suggested that an international association to recognise expertise may be needed.[100] On the other hand, following an accepted standard such as the Berkeley Protocol ought to suffice to validate the credibility of expert opinion, and would maintain the benefits

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[98] Much has been written on the "seeing is believing" phenomenon, e.g. S. Shyam Sundar, Maria D. Molina, Eugene Cho, 'Seeing Is Believing: Is Video Modality More Powerful in Spreading Fake News via Online Messaging Apps?' [2021] 26 *Journal of Computer-Mediated Communication* 301; Emma Rempel, Leah Hamovitch, Lesley Zannella, and Tara M. Burke, 'The power of technology: Examining the effects of digital visual evidence on jurors' processing of trial information' [2019] 33 *Applied Cognitive Psychology* 1288. However, our jury research suggests that where juries are convinced by the opposing party that they cannot rely on a piece of open source evidence, this might have a knock-on impact on other (non-visual) forms of evidence. This is something we will explore further in future studies.

[99] See also Yvonne McDermott, Daragh Murray, and Alexa Koenig, 'Digital Accountability Symposium: Whose Stories Get Told, and by Whom? Representativeness in Open Source Human Rights Investigations' (19 December 2019) http://opiniojuris.org/2019/12/19/digital-accountability-symposium-whose-stories-get-told-and-by-whom-representativeness-in-open-source-human-rights-investigations/

[100] Deniz M. Dirisu, and Manon-Catherine Balbinot, 'Institutionalization: A Way Forward to Prove the Role of Open-Source Intelligence to the Courts' (28 April 2025) https://opiniojuris.org/2025/04/28/institutionalization-a-way-forward-to-prove-the-role-of-open-source-intelligence-to-the-courts/ Judge 12 also noted this in our interview: "In fact, we used to rely a lot on the fact that we had professional investigators who were trained, who had a code of ethics, who could be disciplined if they were doing something wrong. So this sort of presumption of validity, we got it from the quality of the people… So how are we creating, do we create a vetting system of the organizations that either create this content or gather this content? What protocols do we put in place?"

of decentralisation in open source investigations that has aided this field in expanding and innovating.[101] In other technical spaces, such as the evaluation of statistical evidence, judges may be assisted by specialist members of the bench to understand complicated issues.[102] One of the ICC judges suggested that, like the Legal Officers that currently form part of ICC Chambers, one possibility might be to have a technical expert embedded within judges' teams.[103] However, the risk of undue deference to experts whose specialised knowledge goes beyond that of judges, as discussed above, was also noted: "Legal officers is fine, because we're judges, so we're supposed to know the law, but to be assisted by people who know things that we're not supposed to know, it's always [a] risk." As the use of open source evidence in court continues to increase, these three themes of its limits, the importance of the source, and the role of experts are likely to remain at the fore.

[101] Alexa Koenig, 'The History of Open Source Investigations for Legal Accountability' in Sam Dubberley, Alexa Koenig, and Daragh Murray (eds) *Digital Witness - Using Open Source Information for Human Rights Investigation, Documentation, and Accountability* (2020) 46-47.
[102] Anne Ruth Mackor, 'Probability clerks and probability judges: Or how to prevent probabilistic fallacies in court' in Eveline Feteris, Harm Kloosterhuis, H. José Plug, and Carel Smith (eds) *Legal Argumentation: Reasoned dissensus and common ground* (Boom 2024) 111-120.
[103] Judge 12.