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Is Cross-examination an Engine for the Discovery of Truth?

Topic and motivation The legal scholar Henry Wigmore (1940) famously asserted that cross-examination is ‘the greatest legal engine ever invented for the discovery of truth’ (§1367). The U.S. Supreme Court repeated the assertion on various occasions. In *Davis v. Alaska* 415 U.S. 308 (1974), for example, the Court wrote that cross-examination ‘is the principal means by which the believability of a witness and the truth of his testimony are tested’ (316). Yet lawyers are often told that they should not ask too many questions during cross-examination because the answers they will receive could lead to the discovery of information that weakens their case (Wellman, 1903; Clark et al., 2010). From their standpoint, cross-examination might just be an instrument to win cases. Against this background, this project will rely on the analytical tools of philosophy—conceptual analysis, formal modeling and computer simulations—to examine whether or not cross-examination does promote the discovery of truth. By studying cross-examination and truth discovery, we will gain new insights about the relationship between evidence and accuracy in trial decisions. In addition to its epistemological interest, cross-examination is also an important topic in U.S. constitutional law, especially in light of some landmark Supreme Court decisions about the right to confront one’s accusers, such as *Crawford v. Washington* 541 U.S. 36 (2004). As one legal scholar put it, ‘[a]ttention to the undertheorized question of what cross examination actually accomplishes at trial could also ensure that the right to confrontation has some force when it applies’ (Griffin, 2011, 52).

Existing literature Cross-examination is a topic that can be studied as part of the growing field of social and legal epistemology (Goldman, 1999; Gardiner, 2019), but to date there is little or no philosophical work that discusses cross-examination, its scope and function at trial. This project fills this lacuna in the philosophical literature. The legal literature on the subject is not extensive either, as the above quotation by Griffin indicates. Some legal scholars have argued that so long as cross-examination rests so heavily on the information provided by eyewitnesses, it cannot promote truth discovery (see e.g. Epstein, 2007). There is, after all, robust empirical evidence that our memories can be manipulated and our perceptions are less reliable than commonly thought (Loftus, 1996; Wells et al., 2006; Simons and Chabris, 1999). In addition, findings from the *Innocence Project* show that many cases of wrongful convictions occurred in concomitance with eyewitness misidentifications. Yet the significance of these findings for the question whether cross-examination promotes truth discovery is unclear. Although studies show that we are overconfident about the power of our cognitive abilities, there is still a positive correlation between the accuracy of eyewitness identifications and people’s degree of confidence in them (Wixted and Wells, 2017). Further, one of the few empirical studies that used control groups to understand the causes of wrongful convictions found that the main contributing cause is not eyewitness misidentification *per se*, but a tendency to disregard alternative interpretations of the evidence, what is known as ‘tunnel vision’ (Gould et al., 2014). Cross-examination might well be an antidote to tunnel vision insofar as it facilitates the consideration of opposing viewpoints. As some scholars have noted, both witnesses for the prosecution and witnesses for the defense are affected by cognitive limitations, and the cognitive shortcomings on both sides could cancel out during cross-examination (see e.g. Sanchirico, 2009).

Research questions Given the conflicting conclusions one could draw about cross-examination from the empirical literature on eyewitness testimony, it is time for a new start using the analytical instruments of philosophy. This project investigates a number of theoretical questions that could then serve to design new empirical studies about cross-examination. To keep things manageable, the focus is on the criminal trial and the two decisional errors that can occur therein, namely convicting a factually innocent defendant and acquitting a factually guilty defendant. To ask whether cross-examination is an engine for truth discovery, then, is to ask to what extent it is able to guard against false convictions and false acquittals.

In order to formulate the research questions of the project more precisely, it is helpful to single out two characteristic features of cross-examination. First, it encourages the presentation of *more evidence* (or information) at trial. For example, cross-examining an eyewitness ensures that more evidence (or information) is elicited from the witness that would not have been obtained had cross-examination not taken place. The second characteristic feature of cross-examination is that it takes place in an *adversarial* trial. Prosecutors present incriminating evidence and in response defense lawyers call this evidence into question or present their own exculpatory evidence. An adversarial trial is often contrasted with a non-adversarial trial, one in which a third party takes the lead in presenting the evidence (Damaska, 1975). These two features of cross-examination prompt two research questions.

First question: Is relying on ‘more’ evidence more effective at safeguarding against false convictions and false acquittals than relying on ‘less’ evidence? The answer is not straightforward. Suppose we are to decide whether a person committed a crime or not. We can decide by relying on (1) just one item of evidence, say, DNA evidence in the form of a positive or negative match, or (2) two items of evidence, say, DNA evidence together with the testimony of an eyewitness. Which one of the two strategies is better for arriving at a factually correct decision? It might be that the witness testimony is mere noise, while the DNA match, by itself, offers more reliable information. If the quality of the evidence takes precedence over its quantity, (1) will be a better strategy for truth discovery than (2). On the other hand, multiple pieces of evidence each of relatively low quality—as a whole—might be a better guide to the truth than just one, high quality piece of evidence. This deserves further examination.

Second question: Is an adversarial trial more effective at safeguarding against decisional errors than a non-adversarial trial? There is an unresolved dispute between two eminent legal scholars, John Langbein (1985) and Ronald Allen (1987), about the pros and cons of the adversarial method of judicial fact-finding. The literature on the topic has also relied on experimental findings in psychology (van Koppen and Penrod, 2003) and game-theoretic models in economics (Daughety and Reinganum, 2000). This literature is divided and much depends on the characteristics that are ascribed to adversarial and non-adversarial trials. For one thing, an adversarial trial gives an advantage to the side that is better resourced, regardless of where the truth lies, while a non-adversarial trial should be more impartial. Yet, truth discovery in a non-adversarial trial might be hindered by tunnel vision, whereas an adversarial trial should avoid this problem by allowing for multiple viewpoints to be considered. A more careful examination is needed.

The first two questions can be combined in a third research question: Is cross-examination an engine for the discovery of truth at trial because it is an engine for presenting *more evidence* in an *adversarial* context? This question puts forward the core hypothesis of the project. That is, cross-examination is an engine for truth discovery thanks to its two characteristic features: first, it encourages the presentation of more evidence; and second, it takes place in an adversarial context. Whether this hypothesis is correct is far from clear. Cross-examination allows for corrections and clarifications that would not otherwise be given, but if those corrections and clarifications are just noise, they will be detrimental to truth discovery. Some might argue, however, that the information elicited during cross-examination is of particularly good quality because it is produced under adversarial conditions. This deserves closer examination.

Method and execution The project will rely on a combination of philosophical methods, specifically, conceptual analysis, formal modeling and computer simulations. Computer simulations help to generate results without collecting data empirically and in this way gain insights into how a system functions and performs. Computer simulations have become popular in social epistemology and philosophy of science (Goldman, 1999; Zollman, 2007; Olsson, 2011; Hegselmann and Krause, 2006). In order to construct a simulation of the trial system, we first need a model of how evidence is presented, how different pieces of evidence are combined and how decisions are reached given the evidence. The model used in the project combines ideas from Statistical Decision Theory in the law (Kaplan, 1968), Signal Detection Theory (Wickens, 2002) and Condorcet’s Jury Theorem (Nitzan, 2010). By using a computer simulation, the variables in the model can be manipulated, so that different (simulated) trial systems with different characteristic features can be compared. In particular, it will be possible to simulate a trial system in which decisions are based on more pieces of evidence and compare it with another system in which decisions are based on fewer

pieces of evidence. This will address the first research question. To address the second and third research questions, the project will simulate a trial system in which the evidence is presented by prosecution and defense who have divergent interests, and compare it with a less adversarial trial system. Another aspect to be modeled by the computer simulation is the unequal access to evidence and resources for prosecution and defense. This inequality might negatively affect truth discovery, but we should also keep in mind that the decision rule in criminal trials—i.e. the ‘proof beyond a reasonable doubt’ standard—is steeply asymmetric in favor of defendants. The computer simulation will help to see how the unequal access to resources plays out against a steeply asymmetric rule of decision.

Work prior to Summer 2020 Let me now describe the work plan for the project. As of the time of writing this proposal, I have used the programming language R to write parts of the computer simulation needed to address the first research question – that is, whether taking into account more items of evidence better promotes the discovery of truth. The simulation shows that decisions based on more evidence lead to fewer errors than decisions based on fewer items of evidence. Yet the simulation in its current form is too simplistic. It relies on the restrictive assumption that the items of evidence presented at trial are all of the same quality. This is not realistic because items evidence could be of uneven quality, for example, a DNA match is more reliable than shaky eyewitness testimony. During Fall 2019, I will work on amending the simulation in R as needed. My conjecture is that, when pieces of evidence of uneven quality guide trial decisions, taking into account more evidence no longer reduces false positives and false negatives. I will present the results of this phase of the project at the workshop on the Foundations of Probability at Rutgers University in November 2019. During Winter and Spring 2020 once the results of the simulation are known, I will use them to shed light on a long-standing debate among evidence law scholars—the debate about whether or not a trial system should have exclusionary rules of evidence, say, rules excluding character or hearsay evidence (see e.g. Redmayne, 2002). Jeremy Bentham in his 1827 *Rationale of Judicial Evidence*, famously claimed that ‘to exclude evidence is to exclude justice.’ Bentham was concerned that excluding evidence would hamper accuracy. Yet, as discussed earlier, it is not obvious that admitting more relevant evidence always promotes accuracy. This is what the simulation modeling will help to ascertain.

Work during Summer 2020 The results of the simulation will be the basis of a paper titled ‘Does More Evidence Lead to Fewer Errors?’ The paper will touch upon two issues: (a) whether decisions based on more items of evidence—of the same or uneven quality—are more truth-conducive; (b) how the findings in (a) can inform debates in law about exclusionary rules of evidence. The summer of 2020 will be devoted to complete a draft of this paper, as well as build a website illustrating the results of the computer simulation in a visually appealing way. The code of the simulation will be freely available on-line at <https://github.com/marcellodibello/>. For data visualization, I will rely on the expertise of Lok Chen who has agreed to collaborate to the project. Dr. Chen holds a Ph.D. in Philosophy and is now a postdoctoral fellow at Duke University. He has extensive experience in programming, computer simulations and data visualization (<https://lokchan.com/>). His participation will ensure that the visualization runs smoothly. The NEH Summer Stipend will be crucial for me to make progress in the project during Summer 2020.

Work after Summer 2020 During Fall 2020, I will present the paper ‘Does More Evidence Lead to Fewer Errors?’ at conferences and workshops, and then submit it to peer-reviewed journals in philosophy. I will submit the paper to open access journals such as *Philosopher’s Imprint* or *Ergo*. Other philosophy journals, such as *Mind*, *Philosophical Studies* or *Synthese* are also a possibility. They allow quasi open-access by providing a link to the paper that can be posted on one’s personal website. During the academic year 2020-21, I will work on the second and third research questions of the project. A second paper, tentatively titled ‘Is Cross-examination an Engine for the Discovery of Truth?’ will address these research questions. The paper will also be based on simulation modeling. It will be co-authored with Lok Chen and will be accompanied by a dedicated website for data visualization. The expected completion of the project as a whole is Summer 2021. I am extremely eager to complete this project on time. The NEH Summer stipend will be essential for achieving this goal.

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