Gaps in the Evidence

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1 Structure of paper

First talk about some paradigmatic legal cases and established legal framework to handle cases of missing evidence.

One: Salem trials. Here the content of the missing is know, so is it really a case of missing evidence?

Two: Target case. Here tha there is missing evidence is clear (vida was erased), but te question of the conten of the video is open.

Three: could there be other cases in which whether the evidence is missing or not might depend on what kind of partisan story one subscribes to? Or perhaps there might be conflicting stories about why the evidence is missing.

Note that the legal framework only addresses cases of manifest missing evidence — cases in which (a) we know evidence is missing and (b) we know why it is missing (e.g. bad faith, negligence, etc.), so we need to decide what to do with the information (a) and (b), (e.g. draw an adverse inference).

Two limitations of the legal framework: (1) if there is no bad faith intent, then there is no adverse inference to be drawn; (2) given a settled story about what happened, the story itself tells us some evidence is missing. But could there other cases of missing evidence—say more conjectural?

Beyond (1). Consider the case there is no bad faith intent, but the evidence is still missing. What kind of remedy could address the gap in this case? Humer's argument is that since the missing evidence could point in both directions—guilt and innocence—the evidential value should be dismissed. Missing evidence averages out and thus return the same probability of guilt as the original evidence. This argument does not seem correct. So challenge it.

Beyond (2). The even more difficult question is what to do when there is story that clearly tells us that the evidence is missing, or it is not clear that the evidence is missing. Here is the difference between the express "gaps" and "missing evidence" start to matter. For example, do you have a gap in the evidence if you have not considered evidence about how reliable an eyewitness is? Yes and no. This aspects suggests that evidence is open-ended and thus the problem gaps is less pressing.

2 Introduction

It is a truism that trial decisions about matters of fact should be made considering the evidence presented by the litigants. When the answer to a question of fact is disputed, the litigants are expected to present evidence that supports their version of the facts. Whoever presents evidence strong enough to meet their burden of proof should prevail.

A stylized example can make this point vivid. In a civil trial, the plaintiff sues a shop owner because of an injury that occurred in the shop. The floor was slippery. The plaintiff tripped and fell. They had a concussion whose symptoms lasted for more than a month. Their performance at work worsened and they suffered a financial loss as a result. They seek compensation for the loss. This is the plaintiff's version of the facts. The defendant, the shop owner, responds that the floor was not slippery. The defendant did fall and had a concussion—that much is undisputed—but not because of the slippery floor. Plaintiff and defendant are disagreeing about a question of fact. What did cause the plaintiff to trip and fall? What happen, exactly, when the plaintiff tripped and fell? Evidence must be presented by the litigants to resolve the dispute. The party able to offer the stronger evidence prevails. And, since this is a civil trial, the decision rule is that, if the evidence is in equipoise, the defendant prevails.

This picture should be uncontroversial. But there is a complication. Suppose the shop had cameras inside. When the plaintiff tripped and fell, the camera recorded what happened. The recording, if accessible, could unequivocally tell what happened. Suppose this is a settled fact. However, for some reason, the camera recording of that specific incident had gone missing. There isn't much other evidence that could be gathered, except conflicting testimonies by the plaintiff and defendant. That day at that time no one else was in the shop. So the plaintiff cannot make its case because of lack of evidence. What should we conclude from this state of affairs? Clearly, the evidence that supports the plaintiff's case is not any stronger than the evidence that supports the defendant's case. Merely based on the evidence that was presented, the plaintiff should lose the lawsuit.

This outcome is unsatisfactory. Why was the recording missing? The shop owner might have deleted it because they knew they could get into trouble should the customer sue them. If so, should the case be resolved in favor of the plaintiff even though the available evidence does not tip in their favor? Perhaps so. Things might change if it turned out that—purely by accident—the recording was deleted. Without settling how the case should be decided, the upshot is clear. The evidence presented by the parties should guide trial decisions about matters of fact. There is no doubt about that. And yet, in some circumstances, the evidence *not* presented should also play a role in the decision. To examine more closely what these circumstances might be—and their significance for trial decisions—is the task of this paper. We call this the problem of gaps in the evidence or the problem of missing evidence.

Legal systems of adjudication contain rules for handling gaps in the evidence. These rules are elaborate, subtle, intricate. We are not cataloging these rules, nor offering a comparative study of how different systems of adjudication address the problem of gaps. Our aim here is modest—that is, to map out the conceptual terrain. We will examine a few paradigmatic examples of gaps in the evidence. We will then sketch guidelines for building a taxonomy of gaps. Finally, we will discuss how epistemic and non-epistemic considerations can guide the identification of gaps in the evidence as well as how decision-makers should respond to them.

3 Tripping and falling in a department store

3.1 Framework

Questions to consider:

(1) Missing evidence must be relevant for a dispute fact
(2) Missing evidence could make a difference, prejudice
(3) Explanation for missing evidence, e.g. bad faith intent
(4) Remedy, e.g. find against plaintiff with bad faith intent who destroyed evidence

3.2 Example: Decker v. Target Corp

Target customer slips, falls and gets insured in a Target store because of a flatbed, possibly left unattended. injured?
Costumer suffered serious injury, bleeding from the head etc. and had to be transposed to a hospital. Video surveillance footage was only preserved in part. And the rest was destroyed. Hard to reconstruct exactly what happened before the incident. Victim seeks adverse inference jurry instruction against Target for spoliation and bad faith.

Details of the case are as follows: Decker v. Target Corp, Case No. 1:16-cv-00171-JNP-BCW, Filed 10/10/2018

> This Motion arises from a trip and fall incident that occurred on December 26, 2015, at the Target store located in Riverdale, Utah. Caryl Jean Decker was shopping when she tripped on a flatbed stocking cart and fell onto the floor, suffering serious injury. Mrs. Decker, bleeding from the head, received medical attention at the scene of the incident. She was transported from Target by ambulance.
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> ...
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> Exactly one month after the incident, on January 26, 2016, the Deckers delivered a letter to Target, through counsel, requesting that Target preserve "all pertinent records and electronic records pertaining to [the] incident or that could relate to [the] incident," as well as "a copy of any video surveillance that shows [the] accident or the area of the accident at any time

> before, during, or after the event." Motion for Findings of Spoliation and for Sanctions ("Motion") Exhibit 6.

Interestingly, plaintiff does not rely on rule 37(e) but some other spoliation legal doctrine. Not sure why.

> The Deckers, having failed to seek sanctions under Fed. R. Civ. P. 37, seek sanctions under a spoliation of evidence theory. See Turner v. Pub. Serv. Co. of Colo. , 563 F.3d 1136, 1149 (10th Cir. 2009) (quoting Mathis v. John Morden Buick, Inc., 136 F.3d 1153, 1156 (7th Cir. 1998) .... "Spoliation sanctions are proper when '(1) a party has a duty to preserve evidence because it knew, or should have known, that litigation was imminent, and (2) the adverse party was prejudiced by the destruction of the evidence.' " Turner, 563 F.3d at 1149 (quoting Burlington Northern & Santa Fe Ry. Co. v. Grant , 505 F.3d 1013, 1032 (10th Cir. 2007)).

The court basically reasons that (1) there was a duty to preserve the video footage and (2) there was prejudice.

> To support a finding of spoliation of evidence, the Deckers must establish that Target has deleted or failed to preserve relevant evidence and that they have been prejudiced thereby. The court concludes that the Deckers have met this burden with respect to the deleted video surveillance footage.

This the court's detailed explanation which is quite interesting, because it invoked the dynamics of cross-examination and Target was trying to use the lack of evidence in its favor:

> Due to this deletion, the Deckers do not know who placed the flatbed stocking cart at the location of the incident, how long it was there, or why it was there. The Deckers are not prejudiced by the lack of evidence of who placed the flatbed cart because Target does not contest that it was placed on the floor by one of Target's own employees. However, the Deckers are prejudiced by the lack of footage that would have documented whether or not the cart was being "worked" or "attended" by a Target employee. In the footage that remains, there is no evidence of a Target employee working the flatbed cart, nor does the flatbed cart appear to move in the eleven-minute gap between the two clips. A reasonable juror could infer that the cart was unattended. However, in defending against the Deckers' claims, Target intends to offer evidence that one or more Target employees were working or attending the cart.[2] Thus, the Deckers are prejudiced in that they have no way to disprove that evidence.

The final question is whether an adverse inference jury instruction is justified and this requires a showing of bad faith ("To be entitled to an adverse inference instruction, the Deckers must establish that Target acted in bad faith in failing to preserve the evidence at issue.") The issue here is muddled, but the basic rationale here is that (a) Target went against its own policy and destroyed video surveillance that its own policy would mandate to preserve and (b) Target tried to argue that the flatbed was attended by an employee (which is an issue that cannot be litigated since there evidence about what exactly prior ro the incident has been destroyed). So (a) and (b) suggest bad faith on the part of Target as a corporation, even though not in the individual case by the individual who destroyed the video surveillance (they claim they did not now about Target policy). So the court gives the adverse inference jury instruction against Target (that is, there is a presumption that the missing evidence does show that the flatbed was actually unattended).

> First, Target failed to instruct its employees regarding Target policy of what footage to preserve. Second, Target employees failed to preserve all relevant footage. And third, Target's counsel now seeks to take advantage of the evidence that Target failed to preserve by arguing that the flatbed cart was attended or worked by Target employees during the gap in the video. It is this attempt to take advantage of a situation that Target caused that leads the court to conclude Target acted in bad faith. The court will therefore instruct the jury to make the adverse inference that the flatbed cart was unattended for the twenty minutes prior to the accident.

How did the case turn out in court once it was litigated?

4 When gaps in the evidence arise

The problem of gaps in the evidence is pervasive and not confined to legal systems of adjudication. For example, researchers in the social sciences may need to make inferences from datasets that contain gaps:

> consider a large survey of families conducted in 1967 with many socioeconomic variables recorded, and a follow-up survey of the same families in 1970. Not only is it likely that there will be a few missing values scattered throughout the data set, but also it is likely that there will be a large block of missing values in the 1970 data because many families studied in 1967 could not be located in 1970. (Inference and Missing Data Author(s): Donald B. Rubin Source: Biometrika, Vol. 63, No. 3 (Dec., 1976), pp. 581-592)

In such cases, it is paramount to understand the mechanism that explains why some data points have gone missing. If randomness id the explanation, the fact that some data are missing should raise a minor problem. If, instead, the mechanism exhibits a systemic pattern, that pattern must be taken into account and the inferences drawn from the data should be corrected accordingly. What this correction should be like is a difficult question to answer.

The problem of gaps in the evidence in legal systems of justification shares some of the problem of gaps in data sets, but it is also distinctive. The first point to address is why the problem of gaps in the evidence arises. It is instructive to imagine systems of adjudication that are immune from this problem. Consider a legal system that is both complete and infallible—that is, it has access to evidence about every possible fact at any time in any place and this evidence is infallible. The problem of gaps does not arise here. Crucially, it is not the infallibility of the system that eliminates the problem of gaps. For a legal system that was fallible could still be plagued by the problem of gaps. Think of a system that is complete yet fallible. That is, it has access to evidence about every possible fact at any time in any place, yet the evidence could be erroneous. Say, every action by any individual at any time in any place is recorded, and the recording is accessible by the legal system. This is completeness. But suppose that recordings could sometime be erroneous, say because the pixels sometimes get messed up and depict people doing what they were not doing and fail to depict what people were actually doing. This is fallibility: evidence may give a picture of the facts that does not correspond to the facts. This complete yet fallible legal system would not incur the problem of gaps in the evidence, but would still incur the problem of erroneous decisions. It would still be necessary in this legal system to to assess the strength of evidence—say, recordings that show indication of error would count as weaker evidence in favor of what they depicted than recordings that did not show any indication of error. So the problem of gaps of in the evidence is not due to the fallibility of the evidence, but its incompleteness.[1]

In the world we live in, any system of adjudication will be infallible (relying on fallible evidence) and incomplete (without access to evidence about anyone at any time at any time). Fallibility and incompleteness are intertwined. For one may affect the other. Say the truth of some complex proposition $A \wedge B \wedge C$ is under dispute. There is infallible evidence A holds and infallible evidence that C holds, but no infallible evidence about C. Suppose that A, B and C form a temporally ordered series of events: A stands for forming an intention to do φ; B stands for executing φ; and C stands for bringing about a consequence of doing φ. Since A and C are know for sure, then B becomes more likely in light of A and C. In fact, A and C are fallible evidence for B. So, in this case, the incompleteness of the evidence about A, B and C implies the fallibility of the evidence about B and $A \wedge B \wedge C$.

Why could a legal system of adjudication not be complete—that is, fail to have access to evidence about anyone in any place at any time? There could be several explanations for this. First, some facts may not be evidentiable, so to speak. For example, before genetic testing was invented, the fact that a blood stain carried a genetic profile was not evidentiable—it could be translated into evidence. Second, a fact may be evidentiable, but it was not the target of evidence. For example, a blood stain was not analyzed or no witness could see what happened inside the store when the customer tripped and fell. Third, a fact was evidentiable, it was the target of evidence at some point, but the evidence was destroyed or deteriorated significantly later on. Say a video recording of what happened inside the store existed, but it was later deleted. Destruction or deterioration of the evidence could occur as a mere accident or

[1] To underscore this point, a third legal system could exist, one that was infallible yet incomplete. Any recording available would be infallibly accurate, but recordings would not always be available about anyone in any place at any time. This system, despite relying on infallible evidence, would be plagued by the problem of gaps. Whether such a system is conceptually possible is questionable. See the example about $A \wedge B \wedge C$ in the text. If there is infallible evidence about A and C, but no infallible evidence about C, then under certain conditions, there may be fallible evidence about B. So incompleteness implies fallibility.

could be done intentional, for example, when one of the litigants in a trial had an interest in destroying the evidence. There are of course variations in between these two extremes: nor was it accident, nor was it intentional but te destruction was due to someone negligence or failure to follow certain standards.

How gaps in the evidence arise matters for how the legal system should respond to them, what rules it should put in place to remedy this gaps. Assume for now gaps in the evidence are a bad thing. The fewer gaps, the better. This seems right insofar as gaps in the evidence increase the likelihood that a legal decision could be erroneous. So, when rules are put in place to remedy these gaps, they may serve different purposes. the most obvious purpose is to function as forward-looking incentive to minimize gaps. Such rules will primarily target gaps that may arise intentionally or because of bad faith intent. One such rule could go like this: if available evidence cannot settle a factual dispute between litigants and a litigant destructed relevant evidence with bad faith intent of benefiting from the destruction, the dispute should be resolved against the litigant. Presumably, this rule would create forward-looking incentives for litigants not to destroy evidence with the intent of benefiting from the destruction.

But rules that remedy gaps in the evidence may have a more straightforward epistemic, accuracy-maximizing goal. Why should the litigant who destroyed the evidence with bad faith intent be penalized? The following inference is plausible: the missing evidence that was destroyed would be in favor of against the litigant. It is unlikely that a litigant would destroyed evidence in their favor, and thus the evidence must have been unfavorable to them. If the evidence was unfavorable to them, the dispute—had the evidence not been destroyed—the balance of the evidence would have tipped against the defendant. Hence, the dispute must be resolved against teh litigant who destroyed the evidence.

4.1 Hamer's argument

Hamer's first claim: New evidence can turn out to be positive (say incriminating) or negative (exculpatory). Since one cannot know that in advance, the expected probability based on this added evidence (which can be positive or negative) is just the probability based on the current evidence. He proves this claim analytically in the appendix to his paper.

> More generally, if the evidence is missing it cannot be known which way it points. It appears equally possible that the missing evidence would confirm the current factual conclusion as contradict it. The competing possibilities cancel each other out. There is no warrant for the assumption that the missing evidence will point one way rather than the other. (p. 139)

Comment: This claim seems right, but there is one puzzling thing. In our paper on unanticipated possibilities and Bayesian networks, we show that—given a certain causal structure of the Bayesian network (=collider with two upstream nodes incoming into downstream evidence hypothesis, the added node is upstream)—merely positing that there could be new information (say we could learn the witness was unreliable or reliable) would change the initial probability assessment (without learning about the value of the evidence). This is not true in other cases in which the Bayesian network has a serial structure and the added node is downstream and not upstream. So, while Hamer is right in the most abstract sense, there might be causal structural features of a case (as captured by a Bayesian network) that do warrant changing one's probability assessment in virtue of learning that that could be other evidence (even though you do not know what that evidence actually is).

5 From Manifest to Conjectural Gaps

6 Referennces