

# In What Way Are You Qualified? Understanding Epistemic (In)Competence and Expert Persuasion Through the Courtroom of *My Cousin Vinny*

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## Abstract

Expert opinion evidence is ubiquitous in civil and criminal justice procedures. Its use is longstanding, widespread, and influential. However, non-expert factfinders have been criticized for their ineffective management of improper and unvalidated forensic science evidence. Some argue this mishandling arises from the epistemic incompetence of judges and juries. In this paper we use screenwriter Dale Launer's persuasive expert character Mona Lisa Vito from the 1992 film *My Cousin Vinny* to explore the epistemic (in)competence of non-expert evaluators. When placed in the context of expert persuasion scholarship, this analysis reveals strengths and weaknesses of non-expert evaluations of expert witnesses. In particular, there are issues relating to the foundation of expert opinions, the certainty of expert conclusions, and tendency to stray outside one's area of expertise. These matters are examined as potential targets for interventions to improve the reception and handling of expert opinion evidence, as well as the fairness and rectitude of criminal justice procedures.

## Keywords

expert evidence, persuasion, forensic science evidence

Has anyone seen the movie *My Cousin Vinny*? In the film, a young woman takes the witness stand and surprises everyone by demonstrating her expertise about automobiles. It does not necessarily take a Ph.D. scientist to be an expert witness and to provide information that will be helpful to a jury. And it certainly does not require proof of a known error rate. Many factors may influence the weight of the evidence—how much the jury should rely on it—but we could rely on juries to make those decisions as long as the witness is competent and responsible, and the judge gives appropriate instructions about how to evaluate the testimony.

*Rod Rosenstein, Deputy Attorney General, U.S. Department of Justice, 2017*

## Introduction

Expert opinion evidence is ubiquitous in civil and criminal justice procedures. Its use is longstanding, widespread, and influential (Gross, 1991; Jurs, 2016; Siedemann et al., 2005). However, expert opinions—particularly those arising from forensic science techniques, such as latent fingerprint analysis, microscopic hair analysis, and

bitemark comparison—have attracted critical attention.

In 2009, the National Research Council released its report on strengthening the forensic sciences (National Research Council, 2009). In that report by the Committee on Identifying the Needs of the Forensic Sciences Community,

the 17-member committee, with expertise in the mainstream and forensic sciences, concluded that no forensic method, except nuclear DNA analysis, had “been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between the evidence and a specific individual or source” (National Research Council, 2009, p. 7). Put another way, it is a mistake to assume that forensic disciplines were well grounded in scientific methodology, ensuring the validity and reliability of forensic evidence (Edwards, 2010).

Concerns like these, focusing on the validity and reliability of forensic science evidence (and other types of expert evidence; Edens et al., 2012), are significant and sustained. Scholars began raising apprehensions about forensic handwriting comparison, DNA analysis, and latent fingerprint comparison in the 1980s and '90s (Cole, 1998; Risinger et al., 1988; Thompson & Ford, 1989). More recently, authoritative organizations and institutions such as the Government of Ontario, the Scottish Government, The U. S. President's Council of Advisors on Science and Technology (PCAST), and the U. K. House of Lords have joined the fray (Campbell, 2011; Goudge, 2008; Science and Technology Select Committee, 2019; The President's Council of Advisors on Science and Technology, 2016). These groups were attracted to the issue by evidence of faulty and flawed expert opinions undermining the fairness of criminal justice outcomes.

Indeed, there is good evidence that courts and juries misjudge the quality of expert opinions in trials. Courts continue to admit expert opinions of poor, questionable, or unknown quality despite the requirement for scientific and technical opinion evidence to be reliable under the *Daubert* “trilogy” (*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 1993; *General Electric Co. v. Joiner*, 1997; “*Kumho Tire Co. v. Carmichael*,” 1999), *Frye v. U.S.*, 1923, and Rule 702 of the *Federal Rules of Evidence* (National Rules Committee, 2016).

Analysis of DNA-based exonerations obtained in the United States by the Innocence Project shows that misapplied forensic science evidence contributed to more than half of the country's wrongful conviction cases (The Innocence Project, 2023). Similarly, a 2015 investigation revealed that

FBI microscopic hair analysts systematically overstated the value of their evidence, requiring the review of hundreds of cases (Federal Bureau of Investigation, 2015). Yet this awareness has not generalized to other expert opinions. Forensic bitemark evidence continues to be used in trials (Bowers, 2019, Chin & White, 2019; Giannelli, 2016) even though the PCAST concluded that bitemarks analysis is far from being a repeatable, reproducible, and accurate scientific technique (2016). This shows that courts and factfinders are persuaded by low-quality expert opinions. What's more, some legal scholars consider this to be an intractable problem (Lunenburg & Nordenberg, 1981; Steiner-Dillon, 2018).

Courts and factfinders have been described as “epistemically incompetent” when differentiating between experts worthy of belief and imposters who should be unpersuasive (Steiner-Dillon, 2018). Although expert opinions are admitted to assist the trier of fact (National Rules Committee, 2016), judges and juries are not obligated to believe or rely on the opinions of expert witnesses. They are instead instructed to be critical. For example, in California, jurors are advised as follows:

You do not have to accept this witness' testimony. You should judge this witness' opinions and testimony the same way you judge the testimony of any other witness. In deciding how much weight to give to these opinions and testimony, you should consider the witness' qualifications, how he reached his opinions and conclusions, and the factors I have described for determining the believability of testimony. (Committee on Federal Criminal Jury Instructions of the Seventh Circuit, 2012, p. 32)

Similar instructions are used in other jurisdictions, but it is not clear that the indicators listed here, or those generally available to non-expert factfinders, are reliable guides to expert opinion quality. Rather, it is suggested that only experts have the epistemic competence to identify and use the relevant indicators for judging other experts (Collins, 2014; Steiner-Dillon, 2018). In some ways, this view is uncontentious. There is undoubtedly some truth to the proposition that experts are best equipped to evaluate expertise in their own field. However, this stance causes

problems for adversarial legal systems where judgments are made by lay juries (Siedemann et al., 2005).

Indeed, the idea of epistemic incompetence was disputed by the U.S. Deputy Attorney General Rod Rosenstein (Department of Justice, 2017). In his remarks in 2017 at the International Association for Identification Annual Conference, Rosenstein asked a group of forensic scientists if they had seen the movie *My Cousin Vinny* (Lynn, 1992). He then reminded the audience about Mona Lisa Vito, the expert witness in the film, and holds her up to the audience as a paragon of forensic science expert opinions. In doing so, Rosenstein showed that he was persuaded by the expertise of this witness, even though she did not have some of the characteristics you might expect of a forensic science expert (i.e., a Ph.D. in science and a known error rate). He also expressed confidence that, like himself and the film-going audience, real jurors presented with expert opinions will know expertise when they see it (i.e., they have epistemic competence). But was Rosenstein right?

In this paper we explore epistemic competence through screenwriter Dale Launer's character Mona Lisa Vito in *My Cousin Vinny*. By examining how this expert witness is constructed we can see the attributes a non-expert screenwriter believed were necessary to persuade his audience. We can also examine how the chosen attributes align with scholarship about expert persuasion, and we can identify gaps between lay and scholarly approaches to expert opinions. These gaps provide opportunities for improving the evaluation of expert evidence by non-experts in trials.

## Expertise in the Courtroom of *My Cousin Vinny*

The film *My Cousin Vinny* is a “fish-out-of-water” comedy about two young New Yorkers on trial for murder in Alabama. Vinny, the cousin of one of the defendants, is called in to assist with the trial after having recently passed the bar exam. He brings along his fiancée Mona Lisa Vito, called Lisa, for moral support and—unexpectedly—it is her expert evidence that exonerates the defendants. The film was a critical and financial success. Marisa Tomei won an Academy Award for her performance as Lisa, and legal practitioners (in addition to the Deputy Attorney General) have praised the film for its skillful and realistic handling of expert evidence and trial-craft (Anderson, 2016; Carrington, 2019; Posner, 2009). Arguably, though, the brilliance of the film hinges on the transformation of Lisa from Vinny's fiancée into a persuasive expert.

As an Italian-American New Yorker, Lisa challenges dominant stereotypes of Italian-American women of the time. She is more than a beautiful would-be wife and mother: She is also keenly intelligent, quick witted, and legally insightful (Carolan, 2002). More than this, Lisa defies our expectations of experts and expertise. Mr. Wilbur, the prosecution expert in the film, fits a stereotypical view of an expert as a steadfast, middle aged, white male in a suit (Figure 1, Panel A). Lisa is a young, flamboyant, anti-authoritarian, female fashionista (Figure 1, Panel B).



**Panel A:** Mr. George Wilbur, prosecution expert



**Panel B:** Ms. Mona Lisa Vito, defense expert

**Figure 1.** Expert Witnesses in *My Cousin Vinny*

Lisa is an “anti-expert” (Carrington, 2019) who seems ill suited and destined to fail. Yet that is not what happens. As the audience, we “delight in the reversal of fortune” (Carolan, 2002) when Lisa convinces us that she is a genuine expert who should be—and is—believed. How does screenwriter Launer complete this transformation? A close inspection of the script shows that he does it by giving Lisa characteristics of an expert who merits belief.

### 1. Trustworthiness

To start, Launer shows Lisa being physically dragged into the witness box to provide testimony against her will. Her reluctance to participate continues once she is on the stand.

VINNY: Ms. Vito, you’re some kind of an expert in automobiles, is that correct?

*(Lisa glares at Vinny. She sits there, the quintessential unfriendly witness, arms folded and staring at Vinny.)*

JUDGE: Will you please answer the counsellor’s question?

LISA: No. I hate him.

VINNY: Your Honor, may I have your permission to treat Ms. Vito as a hostile witness?

LISA: You think I’m hostile now, wait ‘til you see me tonight.

JUDGE: Do you two know each other?

VINNY: She’s my fiancée.

JUDGE: Well, that would certainly explain the hostility.

In this first exchange, Launer addresses Lisa’s trustworthiness. At this point in the movie, the audience knows that Lisa and Vinny are in a relationship. Therefore, it is reasonable to expect that she might be motivated to provide an opinion that is favorable to the defense, rather than one that is impartial and objective. To manage this, Launer places Vinny and Lisa in conflict. Because of an earlier unresolved fight, Lisa is hostile to Vinny and his goals. Since Vinny and Lisa are not working together, Lisa can be trusted to be an impartial agent for the court. Launer also makes it clear that Lisa is not motivated by ego or self-aggrandizement.

She did not seek out the role of expert and did not willingly cooperate with requests to assist. She is not a “hired gun” whose opinions can be bought (Edens et al., 2012).

### 2. Field

Next, Launer uses the prosecutor (Trotter) to explore Lisa’s general suitability for the role.

TROTTER: Ms. Vito, what is your current profession?

LISA: I’m an out-of-work hairdresser.

TROTTER: And in what way does this qualify you to be an expert in automobiles?

LISA: It doesn’t.

TROTTER: In what way are you qualified?

LISA: Well, my father was a mechanic, his father was a mechanic, my mother’s father was a mechanic, my three brothers are mechanics, four uncles on my father’s side are mechanics...

TROTTER: Your family is obviously qualified, but have you ever worked as a mechanic?

LISA: In my father’s garage, yeah.

TROTTER: As a mechanic, what did you do in your father’s garage?

LISA: Well...tune-ups, oil changes, brake re-lining, engine rebuilds, rebuilt some trannys, rear-ends...

Originally, the prosecutor was incredulous that Lisa knew enough about anything to be considered an expert. And, at first, it appears Trotter’s suspicions are confirmed. Lisa is an out-of-work hairdresser who admits her profession does not qualify her in anything relevant to the case. But, on closer inspection, it is revealed that Lisa has a great deal of experience-- if not formal training or qualifications—with car maintenance and repairs. She has extensive knowledge that is generally relevant to the case<sup>1</sup>.

### 3. Specialty

Lisa’s evidence is called by Vinny in response to the testimony of Mr. Wilbur, the prosecution expert on tire impressions. However, it is not clear that Lisa’s automotive experience enables

her to dispute the opinion of a tire impression expert. Launer uses Trotter to explore this issue on our behalf.

TROTTER: Does being an ex-mechanic necessarily qualify you as an expert on tire marks?

LISA: No (*gets up to leave stand*). Thank you...goodbye.

JUDGE: Sit down and stay until you're told to leave.

VINNY: Your Honor, Ms. Vito's expertise is in general automotive knowledge. It is in this area that her testimony will be applicable. If Mr. Trotter wishes to voir dire the witness to the extent of her expertise in this area, I'm sure he'll be satisfied.

Launer reinforces Lisa's honesty through her continued unwillingness to cooperate with the defense, and then has Vinny clarify the scope of Lisa's expertise. She will not be providing an opinion on tire marks; she has no expertise in this. She will be using her general automotive knowledge to assist the court.

#### 4. Ability

At this point we do not know whether Lisa has sufficient expertise in general automotive knowledge, and we will need proof before we can trust her opinion. Accordingly, Launer provides a demonstration to convince us that Lisa is an expert as claimed. The prosecutor poses Lisa a general knowledge test question. The question chosen is so complex that we understand only a true expert can answer it correctly.

TROTTER: Being an expert in general automotive knowledge, can you tell me...what would be the correct ignition timing for a 1955 Chevrolet Bel Air, with a 327-cubic-inch engine, and a four-barrel carburetor?

LISA: (*squirms impatiently*) That's a bullshit question.

TROTTER: Does that mean you can't answer it?

LISA: It's a bullshit question. It's impossible to answer.

TROTTER: Impossible because you don't know the answer to it?

LISA: Nobody can answer that question.

TROTTER: Your Honor, I move to disqualify Ms. Vito as an expert witness...

JUDGE: (*to Lisa*) Can you answer the question?

LISA: No. It's a trick question.

JUDGE: Why is it a trick question?

LISA: Chevy didn't make a 327 engine in '55. The 327 didn't come out 'til '62 and it wasn't offered in the Bel Air with a four-barrel carburetor 'til '64. However, in '64, the correct ignition timing would be 4 degrees before top dead center.

TROTTER: (*reluctantly, but undeniably impressed*) She's acceptable.

When Lisa identifies a flaw in the premise of the question and then goes on to provide the specific information sought, we are utterly convinced that she knows what she is talking about. Lisa's mastery of automotive ephemera is more than enough to make us see her as an expert in general automotive knowledge.

#### 5. Opinion

After demonstrating her suitability and skill, Lisa provides her opinion relating to the evidence in the case.

VINNY: Ms. Vito, it has been argued by me, the defense, that two sets of guys met up at the same Sac-O-Suds at the same time in Wahzoo City, Beechum County, Alabama, driving identical metallic mint green 1964 Buick Special convertibles. Can you tell, by what you see in this photograph, if the defense's case holds water?

LISA: No. The defense is wrong.

VINNY: Are you sure?

LISA: Positive.

VINNY: How can you be so sure?

LISA: Because there's no way these marks could've been made by a '64 Buick Skylark. These marks were made by a '63 Pontiac Tempest.

TROTTER: Objection, Your Honor. Could we clarify to the court whether the witness is stating opinion or fact?

JUDGE: (to Lisa) This is your opinion?

LISA: It's a fact.

The opinion Launer has Lisa express is emphatic and unqualified. She is positive that the defense (and prosecution) theory of the crime is wrong. There is no way that the car involved in the fatal shooting was the same as the car driven by the defendants. Lisa regards this as a fact rather than an opinion. The marks were made by a Tempest. Lisa knows something that the audience doesn't know, and she is certain about it. There are no shades of gray in her opinion, and there is no room for doubt.

## 6. Support

Even though Lisa's opinion is clear and certain, it seems impossible that she could actually form this opinion based on the available evidence. And Launer does not expect us to take her word for it. Instead, he provides us with the reasoning behind Lisa's opinion so that we can see for ourselves how she knows that the marks were made by a '63 Pontiac Tempest, not a '64 Buick Skylark.

VINNY: I can't believe this kind of information can be ascertained simply by looking at a photograph!

LISA: Would you like me to explain?

VINNY: I would love to hear this.

JUDGE: So would I.

LISA: (referring to photo) The car that made these two equal-length tire marks had Positraction. You can't make those marks without Positraction, which was not available on a '64 Skylark.

VINNY: Why not? What is Positraction?

LISA: It's a limited slip differential that distributes power equally to both the right and the left tires. The Skylark had a regular differential which anyone who's ever been stuck in the mud in Alabama knows that when you step on the gas one tire spins and the other does nothing.

VINNY: Is that it?

LISA: No, there's more. When the right wheel went up on the curb, the left tire mark remains flat and even. The '64 Buick Skylark has a solid rear axle, so when the right wheel goes up the left wheel tilts out and rides on its left edge. But this didn't happen here.

The audience now has access to the logic underpinning Lisa's opinion, and we can see that she has several pieces of evidence supporting her beliefs. We can follow her reasoning and see that there is a solid basis for her inference. Ultimately, we are now persuaded that the car was a Tempest, not a Skylark.

## 7. Consistency

Although we have little reason to doubt Lisa's opinion, Launer takes one important further step to convince us. He calls back the stereotypical expert witness to tell us what we should think about Lisa's testimony.

VINNY: Mr. Wilbur, what'd you think of Ms. Vito's testimony?

WILBUR: Very impressive.

VINNY: Mr. Wilbur, in your expert opinion, would you say that everything Ms. Vito said on that stand was 100% accurate?

WILBUR: I'd have to say that.

VINNY: Is there any way in the world that Buick driven by the defendants could've made those tire marks?

WILBUR: (thinks, shakes head) Actually, no.

Mr. Wilbur is impressed by Lisa's evidence and expresses complete agreement with her opinion. There is now a consensus among those with specialist knowledge. Lisa's transformation is complete. We have no doubt the car driven by the defendant could not have left the marks at the crime scene. Therefore, someone other than the defendants has to be guilty of the offense.

The success of *My Cousin Vinny* arguably hinges on Launer's ability to transform the anti-expert Lisa into a persuasive authority. As we have seen, he achieves this by giving Lisa seven key attributes: (1) trustworthiness; (2) experience in a generally relevant field (field); (3) experience in a relevant specialty (specialty);

(4) accurate performance in the specialty (ability); (5) a clear, certain opinion (opinion); (6) logically sound, evidence-based reasoning (support); and (7) agreement from another expert (consistency).

Ultimately, these characteristics are enough to outweigh the character's role incongruity, and by the end of her testimony we see Lisa's gender, youth, and profession as irrelevant. She has the hallmarks of expertise, and we are persuaded by her opinion. This suggests two things. First, the non-expert screenwriter had a working theory about the characteristics of an expert who is worthy of belief. That is, Launer knew what the audience would need to hear to be convinced by Lisa. Second, these characteristics were persuasive to the non-expert audience. This implies some degree of epistemic competence on the part of the screenwriter and the audience, particularly when the identified attributes are considered in the context of scholarship on expert persuasion.

### Expert Persuasion Scholarship

In attempting to understand expert witness persuasion, researchers often focus on the characteristics of experts who are seen to be more, or less, persuasive. In an early review, Bank and Poythress (1982) sought to identify the "operative mechanics" of expert persuasion. They concluded that the persuasiveness of an expert opinion was determined by their credibility, the structure of their testimony, and juror characteristics. Subsequently, Brodsky, Griffin, and Cramer (2010) proposed that an expert's credibility was determined by four attributes—trustworthiness, knowledge, likeability, and confidence—and that confidence was the most influential of these. But these approaches do not differentiate between those experts who are of high quality and therefore should be believed, as compared to those who are of low quality and should be unpersuasive.

A normative approach differs to "operative mechanics" by starting from first principles and defining what is logically required for an expert opinion to warrant belief. In addressing this issue, Walton (1997; Walton & Zhang, 2016) suggested six attributes relevant to competent

assessments of expert opinion quality. These were as follows: (1) expertise, (2) field, (3) opinion, (4) trustworthiness, (5) consistency, and (6) evidence. More recently Martire, Edmond, and Navarro (2020) elaborated on these characteristics in the context of expert evidence, proposing the Expert Persuasion Expectancy Framework (ExPEX). This framework specifies eight attributes that have been identified by scholars and authoritative scientific institutions as objectively relevant hallmarks of the quality and thereby persuasiveness of an expert opinion: (1) foundation, (2) field, (3) specialty, (4) ability, (5) opinion, (6) support, (7) trustworthiness and (8) consistency.

Specifically, the *foundation* of an expert's testimony refers to the empirical validity (i.e., repeatability, reproducibility, and accuracy) of the field in which the expert is providing an opinion (also known as *foundational validity* per PCAST, 2016). *Field* and *specialty* refer to training, study, and experience that are either generally relevant (e.g., automotive engineering) or specifically relevant (e.g., certification as a Buick service technician) to the opinion provided (for discussions see Edmond et al., 2009; Edmond et al., 2016; Freckelton et al., 2016). *Ability* of the expert is determined by their track record and their ability to form accurate and reliable opinions (also known as *validity as applied* per PCAST, 2016; Martire & Edmond, 2016; National Research Council, 2009). The *opinion* of the expert relates to the substantive judgment or opinion they are providing, its clarity, and the acknowledgement of any limitations (National Research Council, 2009; Walton, 1997; Walton & Zhang, 2016). *Support* examines the presence and quality of the basis for an opinion, and may include the observations, test results, and reasoning that underpin the expert's position (Walton, 1997; Walton & Zhang, 2016). The *consistency* of the expert's testimony is evaluated based on the level of agreement among other suitable experts (Walton, 1997; Walton & Zhang, 2016). Finally, *trustworthiness* refers to the conscientiousness, objectivity, and

honesty of the expert providing the opinion (Walton, 1997; Walton & Zhang, 2016).

In more formal terms, the ExPEX characteristics that should determine expert persuasion are defined as follows:

1. Foundation: Does training, study or experience in the field F support assertions like A?
2. Field: Does witness W have training, study, or experience in the field F?
3. Specialty: Does W have training, study, or experience specific to assertions like A?
4. Ability: Does W provide assertions like A accurately and reliably?
5. Opinion: Does W convey A clearly, and with necessary qualifications?
6. Support: Does W rely on evidence in making A?
7. Consistency: Is A consistent with what other experts assert?
8. Trustworthiness: Is W personally reliable as a source?

As we can see, there is a very high degree of correspondence between the normative ExPEX attributes and the attributes Launer gives to Lisa. Specifically, Lisa is described in terms of seven of the eight ExPEX attributes: field, specialty, ability, opinion, support, consistency, and trustworthiness. Only information about the foundation of her opinion was omitted. This strongly suggests that Launer had some degree of epistemic competence as defined by scholars. It also suggests that non-expert audiences—like those who believe Lisa—can evaluate expert opinions in sophisticated and sensible ways when given access to the information they need to complete their evaluations.

Experimental research examining non-expert evaluations of expert witnesses provides some support for this basic epistemic competence. In one online study, jury-eligible research participants were presented with an expert opinion in the field of forensic gait analysis and were asked to rate its credibility, value, and weight (Martire et al., 2020). Forensic gait analysis involves comparing the movement and posture of perpetrators from crime-related images to images of suspects

(Edmond & Cunliffe, 2016). On average, the 50 participants who viewed an expert who was “strong” on all ExPEX attributes saw that expert as very convincing, rating the person 88.4 out of 100 for persuasiveness (the average of credibility, value, and weight ratings). In a parallel study, a different group of 50 jury-eligible participants viewed a “weak” ExPEX forensic gait opinion as unconvincing, rating that person 15.4 out of 100 on average for persuasiveness.

Similarly, a study of Australian magistrates (Martire & Montgomery-Farrer, 2020) showed that those presented with a forensic gait expert who was “strong” on all ExPEX attributes ( $n = 10$ ) rated the opinion as 64.5 out of 100 for persuasiveness. These ratings were significantly higher than the ratings provided by participants ( $n = 15$ ) who viewed an expert who was weak on field, specialty, ability, and trustworthiness (mean = 8.58). What is more, when given the opportunity, 16 of these magistrates requested an additional 40 pieces of information to assist their evaluation of the expert opinion. These requests were coded by two independent raters and showed that in all but two instances magistrates wanted more information about ExPEX attributes.

Overall, the results of these simplistic studies suggest that non-expert evaluators know what information they should be attending to—indeed it was the type of information that magistrates sought out. They also indicate a degree of competence in the evaluations that result when decision-makers are given the same types of information that Launer provides to his audience in *My Cousin Vinny*. Yet, we know that the evaluations of experts by real judges and juries are far from perfect.

In laboratory studies Younan & Martire (2021) found that *both* objectively high-quality and objectively low-quality expert evidence were positively regarded, and that evidence quality *and* expert likeability (an irrelevant cue) significantly affected expert persuasiveness. Furthermore, in the real world, microscopic hair comparison and forensic bitemark evidence are persuasive but scientifically questionable (Federal Bureau of Investigation, 2015; Saks et



al., 2016). Latent fingerprint comparison techniques were rarely challenged by courts (Edmond, 2022) and were not validated until as recently as 2011 (Tangen et al., 2011). There are also many cases where erroneous expert opinions have implicated innocent defendants (Garrett & Neufeld, 2009). Thus, there are clearly practical limits to the epistemic competence of non-experts. The character Lisa also provides some insight into these weaknesses.

The testimony of Lisa, and our handling of her evidence, is limited in several ways. First, as already mentioned, Launer did not consider it important to inform his audience about the foundation for Lisa's opinion<sup>2</sup>. Foundation relates to the repeatability, reproducibility, and accuracy of the field, discipline and/or technique (The President's Council of Advisors on Science and Technology, 2016). PCAST considered evidence of foundational validity (e.g., the error rate for the technique) *sine qua non*—second to none—for establishing the expertise of an opinion (2016), and many scholars agree with this view (Edmond et al., 2016; Edmond et al., 2014; Koehler, 2018). In the case of Lisa's evidence, however, we do not have access to this information. We do not know if a good command of general knowledge about cars can actually equip Lisa—or anyone else—to make repeatable, reproducible, and accurate conclusions about whether a particular model of car had a particular type of suspension or differential. Yet, as the audience, we consider Lisa to be highly persuasive anyway. Indeed, the former Deputy Attorney General Rod Rosenstein considered the information about foundational validity contained in “known error rates” to be irrelevant to the quality of Lisa's expertise (Department of Justice, 2017). This response appears typical of non-expert evaluators.

Judges and jurors do not consistently show an appreciation for the foundational validity of expert opinions. For example, *Daubert* and the Federal Rules of Evidence require judges to consider the foundational validity (e.g., testing and error rate) of scientific or technical evidence before admitting it as an expert opinion.

However, judges have been criticized for their inconsistent and ineffective application of the criteria (Giannelli, 2017; Hilbert, 2018; Kaplan & Puracal, 2017; Schwartz & Silverman, 2006). Experimental studies of experienced and mock jurors reveal similar problems. Mock jurors, judges, and attorneys presented with expert testimony in studies were limited in their responses to experimental confounds, low ecological validity, and the low technological sophistication of the evidence supporting an expert opinion (Chorn & Kovera, 2019; Koehler et al., 2016; McAuliff & Duckworth; McAuliff et al., 2009). Magistrates also asked for additional information about foundation in only 7.84% of requests (Martire & Montgomery-Farrer, 2020). Thus, Launer's omission shows a limit to the epistemic competence of non-experts that is in line with existing scholarship. Non-experts appear to have a blind spot when it comes to establishing foundational validity and understanding its relevance to expert quality.

The second weakness we see relates to the characteristics of Lisa's opinion. Lisa is “positive” that a mistake has been made in the case because there is “no way” the defendant's car could have left the tire marks at the crime scene. Lisa has no doubt about her opinion. She considers it to be factual and does not hint at any possible alternative explanations. Launer anticipated that we would see this as a persuasive form of opinion. He was right. Research surveying experienced jurors, judges, and attorneys shows a preference for those experts willing to draw firm conclusions as compared to those who are not (Brodsky et al., 2010; Champagne et al., 1990; Jurs, 2016)<sup>3</sup>. Yet, those with epistemic competence know that high quality opinions are modest and include uncertainty and a description of limitations (Edmond et al., 2016; National Research Council, 2009).

Genuine experts are hesitant to provide definitive opinions. Research shows that genuine expertise is generally accompanied by a conservatism that comes from understanding the inevitable complexities of the field and the evidence (Bird et al., 2010; Tangen et al., 2011; Tetlock, 2017). Furthermore, expert witnesses

are often attempting to reason “backwards” from the specific evidence in a case (e.g., tire marks, finger marks, etc.) to a general theory; for example, about the source of the marks (Berger, 2010). This is a form of inductive reasoning, and it does not generate definitive conclusions. Experts acknowledge this by including probabilities, uncertainties, and limitations in their opinions (Balding et al., 2017; Edmond et al., 2014; Morrison, 2016; National Research Council, 2009; Sjerps & Berger, 2012; Willis et al., 2015). Thus, it is a mistake for non-experts to be more persuaded by unequivocal experts. It is the amateurs who tend to give absolute opinions.

The third weakness in Lisa’s testimony is potentially the most concerning and illuminating. By the end of her testimony, it is clear that Launer succeeded in constructing a persuasive witness who is completely compelling to the audience. He has achieved this by providing clear information about her expert characteristics. Ultimately, we are allowed to feel confident that Lisa is an expert whose opinion is worthy of belief. However, upon closer inspection, it becomes clear that we were misled.

When Lisa is brought to the stand, we initially anticipate that she is going to provide expert evidence on tire marks. The prosecutor proceeds to question her on this basis and is doubtful that she is appropriately qualified for the job. However, when Lisa is asked directly about the nature of her expertise, she agrees that she is not qualified to testify about tire marks and tries to leave the stand. Vinny resolves the impasse for us, telling us that Lisa is not going to testify about tire marks, she is going to testify about general automotive knowledge. Lisa is then tested on her general knowledge by the prosecution and passes with flying colors. We are convinced that Lisa is an expert who can and will testify about general automotive knowledge. But that is not what happens. Instead, she testifies about tire marks anyway.

When giving her evidence Lisa is provided a picture of the tire marks left at the crime scene. She observes “two, equal length tire marks” and forms the opinion that the car must have had

Positraction to leave the marks. She points to where “...the right wheel went up on the curb, the left tire mark remains flat and even” and infers that the car leaving the marks had independent rear suspension. She then throws in an estimate of the power of the car based on the marks, and then she combines this information with her general automotive knowledge to form the subsequent conclusion that the crime was committed by perpetrators driving a Pontiac Tempest:

LISA: ... [I]n the sixties, there were only two other cars made in America with an independent rear suspension, Positraction, and enough power to make these marks. One was the Corvette, which cannot be confused with a Buick Skylark. The other car, however, had the same body length, height, width, weight, wheelbase, and wheel track as the 1964 Buick Special, and that was the 1963 Pontiac Tempest.

Throughout her testimony, Lisa provides opinions based on the interpretation of tire marks rather than general knowledge, and we are persuaded by them. Yet Lisa admitted that she was not an expert in tire marks, and Vinny agreed. Furthermore, we believe Lisa’s opinion even though she did not demonstrate any ability to correctly determine the type of differential, rear suspension, or engine power from an inspection of tire marks. Thus, it turns out that we really don’t know if Lisa can determine the make of a car from its tire impressions, but we are utterly convinced by her evidence anyway. We fail to notice that Lisa had strayed outside of her field of expertise. This is particularly concerning because this phenomena happens in real trials, just as it did with Lisa’s fictional testimony.

Studies of expertise show that expert performance is narrow in scope and does not automatically generalize to tasks across domains (Bedard & Chi, 1992; Ericsson & Lehmann, 1996), or even between tasks within the same domain (Chase & Simon, 1973; Martire et al., 2018; however, see also Grows et al., 2022). Yet real expert witnesses also stray outside their areas of expertise. Forensic odontologists are permitted by courts to make bitemark

comparisons even though they are trained as dentists (Balko & Carrington, 2018; Giannelli, 2016; Saks et al., 2016). Forensic gait analysts are permitted to compare movement and posture even though they are trained as clinical podiatrists (Cunliffe & Edmond, 2013; Edmond & Cunliffe, 2016). What's more, these types of opinion are admitted even in the absence of evidence about foundational validity (Koehler, 2017; Martire et al., 2019; PCAST, 2016), or the personal proficiency/ability of the examiner (Koehler, 2013). Neither forensic odontologists nor gait analysts have empirically demonstrated that their comparisons can be—or are—validly and reliably made (Avon et al., 2010; Cunliffe & Edmond, 2013; Edmond & Cunliffe, 2016; PCAST, 2016).

Indeed, one of the dominant concerns regarding the admission and reliance on expert opinions is the failure for courts to identify when an expert has given an opinion that is outside the scope of their training, study, and/or experience (Derwin, 2018; Freckelton et al., 2016; Jurs, 2016; Martire & Edmond, 2016). Given this, the comments made by Rosenstein, the former Deputy Attorney General and a highly experienced criminal trial lawyer, about Lisa are particularly concerning. They are also emblematic of the larger problem. Like us, an experienced lawyer either did not notice or did not care that Lisa was unqualified to provide the opinions she gave. And it was not because she was obviously incompetent, or irresponsible (Department of Justice, 2017). That we were all persuaded by Lisa reveals a significant limit to our epistemic competence and that of non-expert factfinders.

## Conclusion

The preceding analysis of the testimony of Lisa suggests several important points about the epistemic competence of non-expert factfinders. First, it is probably a mistake to assume that non-experts are incapable of sensibly evaluating the quality of an expert opinion (Steiner-Dillon, 2018). We are persuaded by Lisa for good reasons. She has many of the attributes that scholars consider logically relevant to determining the quality of an expert opinion. She has general and specialist experience, she demonstrated her ability

in a convincing manner, she provided us with a clear opinion based on evidence, and she was supported in her conclusions by another expert. That we believe an expert opinion with these characteristics strongly implies some degree of competence. But this is a double-edged sword: The fact that we were persuaded by this particular witness also shows the limits to our competence.

Non-expert factfinders can be inattentive or mistaken about some important expert attributes. We viewed Lisa's firm conclusions as persuasive, even though many forms of expert opinion are inherently uncertain and therefore should be tentative (Berger, 2010; National Research Council, 2009). We assumed that there was a scientific foundation to her opinions, even though this was never established (Lander, 2017; PCAST, 2016). And we failed to notice when she strayed outside her area of expertise, even when we had the information necessary to detect the transgression (Martire & Edmond, 2016). Given that it is not feasible (at least in the short term), or perhaps desirable, to replace non-expert juries with expert judicial officers as proposed by some (Lunenburg & Nordenberg, 1981; Siedemann et al., 2005; Steiner-Dillon, 2018), we must instead focus on addressing the weaknesses in non-expert evaluations if we hope to fix the problem.

Specifically, we can act on calls to support judges in their assessments of the foundational validity of expert opinions (Chlistunoff, 2015; Chorn & Kovera, 2019; Domitrovich, 2017; Tully, 2018). We can continue to work with experts to ensure that their conclusions are modest and scientifically supportable (Balding et al., 2017; Hicks et al., 2019; Marquis et al., 2016; Willis et al., 2015). We must demand even more forcefully that courts require demonstrations of ability from experts (Edmond, 2015; Edmond et al., 2016; Martire & Edmond, 2016; Mitchell & Garrett, 2019). And we can find ways to encourage and support judges, juries, and experts to attend more closely to the alignment between opinions and expertise (Martire & Edmond, 2016). If we do not do these things, it is likely that poor-quality expert opinions will remain persuasive to non-experts and will continue to undermine the fairness and rectitude of criminal justice systems.

## Endnotes

1. Launer hinted at Lisa's mechanical experience for the audience in earlier scenes. This exchange in the courtroom formalizes the scope and nature of her knowledge for the audience.
2. Trotter does indicate that he objects to Lisa's evidence due to "improper foundation." However, he goes on to explore foundation in the legal sense (i.e., relating to qualifications) rather than in the scientific sense (i.e., relating to the validity of the field).
3. These studies also suggest that decision-makers prefer experts who can express complicated ideas in simple terms, just as Lisa does when explaining Positraction to the jury: "[A]nyone who's ever been stuck in the mud in Alabama knows that when you step on the gas, one tire spins and the other does nothing."

## Author's Declaration

The author declares that there are no personal or financial conflicts of interest regarding the research in this article.

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Received: 9 August 2022

Revision received: 10 February 2023

Accepted: 7 July 2023

