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Methodology on Trial: The Rhetorical Function of Toulminian Warrants in Expert Testimony

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For the degree of Doctor of Philosophy

Is approved by the final examining committee:

Patricia Sullivan

Chair

Jennifer Bay

Thomas Rickert

Mark Hannah

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Date

METHODOLOGY ON TRIAL: THE RHETORICAL FUNCTION
OF TOULMINIAN WARRANTS IN EXPERT TESTIMONY

A Dissertation

Submitted to the Faculty

of

Purdue University

by

Luke Redington

In Partial Fulfillment of the

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of

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For all who long to see justice roll like a mighty river

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I am forever grateful to my dissertation chair, Professor Patricia Sullivan, for urging me to follow my heart as I planned this study. Because I am naturally risk averse, I had initially planned a project that felt safe and predictable. But, one day during office hours, Pat offered me the following advice: “A dissertation is a long-term project. There will be times when you will wonder how you will finish. In those times, the best motivation you can have is that which comes from your own investment in what you are studying.”

Pat saw that what I really wanted to study was the challenges expert witnesses face in jury trials. She also saw that I wanted to take an empirical approach to my research questions. In short, she foresaw that the project I really longed to do was one that would involve frequently dealing with unpredictable factors. Every time something unpredictable happened, Pat was there to help me learn from it and move forward. So, in retrospect, I see that Pat must have also foreseen the ways in which this project would stretch me.

Professor Jennifer Bay saw from this project's inception how deeply interwoven it would become with questions social privilege, race, and gender. Anytime I would start to retreat into abstract ideas, Jenny would ask me what my ideas would mean for people who can't afford to hire an expert witness or for people who are immediately judged in the courtroom by their appearance.

Professor Thomas Rickert saw that my project would need to orient itself within the history of rhetorical thought. Within the first two minutes of our very first conversation about this project,

Thomas brought up Aristotle. Two minutes later, I was convinced that Aristotle was indispensable to a discussion of expert witnesses in today's courtrooms.

Professor and lawyer Mark Hannah saw that this project would require me become dexterous at switching perspectives: How would a lawyer read this definition? What would a technical communication scholar say about this workplace dynamic? Why would a scientist insist on phrasing her answer this way? Mark modeled this perspectival dexterity in his feedback on this project, a skill I endeavor to emulate.

Daniel Teefey was my friend when I began this project; by the project's conclusion, he was my brother. Dan's insights about the practice of law, about the ardor of law school, and about the value of intuition in making decisions were essential to my project. His constant support, his cheerfulness, and his steadfastness were essential to me.

An adequate description of the role my wife Rose has played would require its own dissertation. Instead, I offer this portrait: My best writing sessions happen in the early morning, but only if I plan ahead. The night before, several things need to fall into place. I need to heed Stephen King's advice to "Quit before you're done," which is hard for me because even though this advice always pays big dividends, I still always feel by taking it I risk losing momentum. I need to make my sandwich for lunch the next day, a task which always feels confoundingly complicated if I try to do it in a hurry on the way out the door. In other words, I become high maintenance while engrossed in a writing project. Being many times longer, more complicated, and more fraught with contingencies than anything I had previously attempted, this project put me through periods of being exceedingly high maintenance. I will never fully know the extent of the sacrifice, patience, and endurance Rose demonstrated to make this project possible. I just know that during those times when I practically disappeared into my writing, Rose carried me

along. I know that her dedication to her career provided us the means through which I could undertake a project of this scale. I know that her patience with me had the ability to make time stand still or run quickly, whichever was needed. And, she always knew what was needed, especially when I did not. I harbor no misconceptions that such kindness can be repaid. I only hope someday I'll know what adequate gratitude looks like.

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ABSTRACT

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While providing expert testimony in jury trials, scientists face an array of conflicting legal requirements. Expert witnesses must demonstrate the soundness of their scientific methodology, but they must do so with little or no reference to the literature of their field. They must explain advanced scientific concepts while phrasing their explanations as a direct response to a lawyer's question. This project examines the rhetorical strategies expert witnesses utilize as they negotiate these conflicting requirements. Previous studies have examined persuasive discourse created for and by members of an scientific academic discipline, but my study examines how scientists defend their knowledge making practices to public audiences in a highly pressurized, overtly agnostic setting. My study also features a distinctive emphasis on the portions of expert testimony in which expert witnesses describe and defend the scientific methodologies that under-gird the evidence they present to the jury. To analyze these statements, I combine a Toulminian coding system with one developed to analyze assertions of expertise made in non-academic contexts. I identify four distinct challenges expert witnesses face. I then trace the origins of these challenges to differences in the processes through which lawyers and scientists are professionalized. I elucidate the implications these challenges have for our justice system, for the scientific community, and for technical communication scholars.

1. CHAPTER ONE: EXPERTISE AS DEFINED AND DEPLOYED IN JURY TRIALS

1.1 INTRODUCTION: AN OPEN-AND-SHUT CASE REOPENED

As Kimberly Ward stepped outside the Indianapolis motel where she lived and worked as a prostitute, a dead body fell out of the night sky. It landed on the pavement near a dumpster. Ward screamed. She ran back to the room she shared with her boyfriend, explained her experience as best she could while gasping, and called the police.

Two uniformed officers were on scene within minutes. They partially removed the motel bed sheet in which the body was wrapped and checked for signs of life. Finding none, they called the medics, who in turn called the homicide unit. By now, it was late—about 11:30 pm on Thursday, September 15, 2011—but when Detective Brian Schemenaur arrived, he immediately began knocking on all the doors of the Travel Inn. He paid particular attention to the accounts given by the two occupants of room 229. They claimed to know nothing but seemed especially nervous. Also, their second story room was directly above the spot where the body had landed.

The next day, Schemenaur interviewed Kimberly Ward and her boyfriend Michael Richard in greater depth. She said she had left her motel room and headed across the street to get some change at Taco Bell. When the body fell, it almost hit her. In the moments immediately after, a man fled up the nearest flight of stairs. Moments after Ward arrived back at her room, a woman

in a hooded sweatshirt and baseball cap knocked on their door and asked to come in. Ward refused, but let the woman ask questions from outside—questions about what she had seen. “Nothing,” Ward said through the door. Richard's statement was even more detailed; he too had seen a woman in a hooded sweatshirt “acting strangely” a little earlier that night, and he knew her name to be Heidi. Richard added that Heidi had a “nutty” uncle named Tony Steenbergen, of whom Richard was “terrified.”

The pieces were beginning to come together for Detective Schemenaur. The man who ran up the stairs and the woman who asked questions through the door fit descriptions of the occupants of room 229, Jose Hernandez-Arroniz and Heidi Carpenter. Schemenaur asked them both to come to the police station to give statements, and they did. They both signed documents waiving their rights to have an attorney present—a detail scrupulously recorded in the police reports and court records on which this account is based. In separate interrogation rooms, they gave nearly identical stories. Schemenaur records Carpenter's story as follows:

Carpenter stated that on the evening of September 15, 2011, her aunt's ex-husband Tony Steenbergen arrived unsolicited at the hotel room she shared with Hernandez-Arroniz. She stated Steenbergen told Hernandez-Arroniz to call the front office and tell the manager [named Dinesh Patel] the heat in the room wasn't working. She stated Steenbergen told her and Hernandez-Arroniz to do what he said or he would kill them and their family. She stated when Patel arrived and walked in the room Steenbergen began hitting Patel with a metal pipe. Carpenter stated she looked away, but saw that Patel ended up on the floor unresponsive. (2014, p. 31)

On this and all other main points, Carpenter's story matches that given by Hernandez-Arroniz. They both add that they were instructed—again under threat to themselves and their families—

to dispose of the body, which they did by wrapping it in a bed sheet and throwing it from their second story balcony, aiming at the nearest dumpster. Carpenter's account concludes in this way: "Steenbergen took a bloody comforter, a bloody sheet, a bloody pillow, and Patel's jacket and left. She stated she had known Steenbergen to drive an older, primer-gray Ford pick up." (2014, p. 31)

Steenbergen agreed to come the police station the next day and give a statement. He emphatically denied all points of Carpenter's story but was summarily arrested for Patel's murder. A search of his home and pickup produced a pair of shoes spattered with blood. To make Steenbergen's situation worse, he got caught right away in a lie. He denied having been in contact with Carpenter for over a month, but his girlfriend told police that he had spoken to Carpenter by phone earlier that week, a claim they would easily verify. To Detective Schemenaur, this was beginning to look like a sure thing.

Then, the detective began to receive results of DNA tests. Forensics specialists had found no trace of Steenbergen's DNA at the hotel, but they had found many samples containing a mixture of Carpenter's blood and the victim's. Steenbergen's blood-spattered shoes—the most conclusive piece of evidence to date—contained only his own blood. So, the detective refocused his investigation back on the occupants of Travel Inn room 229. In subsequent interviews with Carpenter, contradictions piled up, just as subsequent DNA testing tied Carpenter to each important facet of the crime scene. Detective Schemenaur released Steenbergen and arrested Carpenter instead.

When the case against Carpenter went to trial, public defense attorney Ted Minch would not let the jury forget that Steenbergen had been the first prime suspect. Minch's overall strategy

hinged on using this fact to engender reasonable doubt about Carpenter's guilt. The prosecution countered this strategy by presenting an abundance of expert witnesses who testified about how DNA was collected at the crime scene, transported to the lab, tested, and finally entered into evidence. Of these expert witnesses, the most important was Tonya Fishburn. It fell to her to explain what sorts of tests the lab conducted on DNA samples and why these tests were a reliable way to determine whose blood or body fluid the samples contained. Thus, Detective Schemenaur, Tony Steenbergen, and Heidi Carpenter each had a lot at stake when Fishburn took the stand. Everything depended on whether Fishburn could get the jury to feel certain that the tests the lab used were trustworthy. But as is so often the case, Fishburn had to educate her audience before she could persuade them. In particular, she needed to educate the jury about Short Tandem Repeat (STR) testing, a method commonly relied on for matching a DNA sample to a specific person. STR testing consists of four steps, and each step must be completed correctly in order for the next step to produce reliable and admissible results. In reading the following excerpt of Fishburn's testimony, which I have reproduced here verbatim from the court record, consider the amount of technical information the jury must process in order to decide how confident they feel about the reliability of STR testing. Fishburn explains:

The purpose of DNA comparison is used to determine if there's a link between victim/suspect, victim or crime scene or a suspect and crime scene. DNA, it stands for deoxyribonucleic acid and it's basically the blueprints that tell our body how to develop and function. It doesn't change throughout our life, so whatever your DNA profile is when you are born will be the same DNA profile you have when you die and it's the same throughout the body. So if I developed a DNA profile from say your blood, it would be the same DNA profile that I would get from your hair or any other part of the body. The specific type of DNA that we look at, it's called nuclear DNA. It's found in all cells that have a nucleus so this would be white blood cells in your blood, your skin

cells, the root of your hair, sperm cells, tissue cells, any of these would have a nucleus and have the type of DNA that we look at. The DNA is packaged into chromosomes. There's 23 pairs of chromosomes, we receive one set from mom and one set from dad so we actually have 46 total chromosomes. Now the type of DNA testing that we actually do is called short tandem repeat and that's, what that is there's a location in your DNA that gets repeated over and over and the number of times that repeat occurs will vary from one person to another. So say at one of your locations, STR regions, you have 14 repeats. I may have 15 repeats at that region. So this is what we're actually looking at, the number of repeats that you have at these regions. And so, we actually look at—now we actually look at 15 of these regions within your DNA and determine the number of repeats you have and that's what your DNA profile is. There's four steps involved in developing a DNA profile and I'll go through those. They are extraction, quantification, amplification and analysis of results. So extraction is basically, um, DNA is inside the cell so the cell is broken open and the DNA is released, and we do this by treating it with chemicals that will break the cells open, releasing the DNA. And then we'll remove any of the non-DNA portion of the sample and then we're left with concentrated DNA that's in a small volume. Now quantification step, we're basically just asking the question how much DNA is actually in the sample and this is necessary to optimize the next steps of the testing process. Now the the third step is called amplification and in this step we're making millions of copies of the DNA and what we're doing those regions I was talking about earlier that this repeat is occurring, we target those 15 regions and I make millions of copies of just those regions of the DNA and this is how I'm actually able to develop a profile from just a really small amount of DNA. So, you know, just a drop of blood would have way more DNA than I would actually need to develop a profile from. And then the final step is the comparison of the

DNA profile, so the DNA profile from the evidence item is compared to the DNA profile from standards, and standards are individuals known or believed to be involved with the case. We take a sample from them, it's either a blood sample or a buccal swab, which would be, buccal swab is the swabbing of the inside lining of the cheek¹. And so I will develop a profile from that standard and determine how many repeats they have at those 15 regions and I'll compare that profile to the profile that I developed from evidence items and see are those number of repeats the same between those or are they not. Some possible results would be exclusion, meaning that those repeats don't match each and there's no match between the evidence and the standards, so that DNA did not come from that individual. Inclusion, this would mean that the DNA profile did match that individual and it could have come from that individual and so those are usually accompanied by statistics to say how rare is that profile, what's the likelihood that some else could also have that DNA. So we know, it gives some weight to the—if it's a match, how likely is it that it is from that individual. And then the third possibility is inconclusive and this happens when there's not enough DNA or there's degradation from, like, environmental factors and so there's not enough of a DNA profile developed to be able to determine did that DNA actually come from that individual or not. (2014, pp. 298–303).

This passage exhibits several tensions inherent in trying to educate and persuade under the constraints built into a jury trial. Perhaps as a demonstration of her expertise, Fishburn uses technical vocabulary, but she also recognizes the need to define or gloss these terms for the jury. This passage also evidences Fishburn's awareness of the balance that must be struck in providing enough technical data to educate the audience but not so much that they lose sight of

1 This transcript contains multiple departures from standard grammar, all of which I have reproduced here. This one is interesting in that it probably represents a typo rather than a malapropism. This passage is taken from the transcript the Indiana court of appeals was given by the Marion County court in which the original criminal trial occurred. Video and audio recordings were not made, so there are no means of tracing the error to its origins.

the point being argued, i.e., whose blood the samples contain. This balance is particularly hard to strike under the strictures of direct examination, where all witnesses, including experts, must phrase everything in the form of an answer to only one question at a time. In this respect, Fishburn's answer is long; its 800 words take about five and half minutes to read aloud. On the other hand, that is a short span in which to take the jury from learning rudimentary principles of cellular biology to feeling certain about the results of a sophisticated, relatively recent testing method. To help the jury feel certain about the trustworthiness of STR testing, Fishburn extolls the soundness of its methodology. She tailors her discussion of the nature of DNA to emphasize that each person has a unique, unchanging DNA profile. She then explains that what makes a DNA profile unique is the number of times it repeats a certain pattern. In this light, testing for those patterns seems a reliable, even natural thing to do. Due largely to DNA evidence, the jury convicted Carpenter.

I have presented Carpenter's case at length because in its essential features, it demonstrates the high stakes and rhetorical complexities which typically attend expert testimony in jury trials. Many cases resemble Carpenter's in that expert testimony becomes key evidence that clinches the verdict. Many cases, like Carpenter's, include expert testimony that seeks to win over the jury by either instilling or eroding certainty in the scientific methods used to generate the evidence presented at trial. That methodological component of expert testimony is the central focus of this project. While providing expert testimony in jury trials, scientists face an array of conflicting legal requirements. Expert witnesses must demonstrate the soundness of their scientific methodology, but they must do so with little or no reference to the literature of their field. They must explain advanced scientific concepts while phrasing their explanations as a direct response to a lawyer's question. Expert witnesses must also show solidarity with their scientific peers even as lawyers pit scientists against one another on the witness stand. This

project examines the rhetorical strategies expert witnesses utilize as they negotiate these conflicting requirements. I have designed my study as both an extension and a variation on previous technical communications studies of science-based argumentation. Previous studies have examined persuasive discourse created for and by members of an scientific academic discipline, but my study examines how scientists defend their knowledge making practices to public audiences in a highly pressurized, overtly agnostic setting. My study also features a distinctive emphasis on the portions of expert testimony in which expert witnesses describe and defend the scientific methodologies that under-gird the evidence they present to the jury. To analyze these statements, I combine a Toulminian coding system with one developed to analyze assertions of expertise made in non-academic contexts.

1.2 DEFINING EXPERTISE IN COURT

Although the legal field does not endeavor to define expertise in the abstract sense, it has a well established, highly uniform definition of an expert witness. This uniformity exists because most state legislatures model their definition of expert witness after the definition found in the rules that govern the admission of evidence and testimony in federal courts. My project examines jury trials within Indiana, one of the many states which has basically adopted the federal definition of expert witness. Consequently, this study's research questions and methods could readily be adapted for use throughout the United States. However, Indiana's definition is worded somewhat differently than the federal one, and rulings by the Indiana Supreme Court provide additional lexical nuance. The definition occurs in Article VII of the Indiana Rules of Evidence, which is here reproduced in full:

Rule 701. Opinion Testimony by Lay Witnesses

If a witness is not testifying as an expert, testimony in the form of an opinion is limited to one that is:

- (a) rationally based on the witness's perception; and
- (b) helpful to a clear understanding of the witness's testimony or to a determination of a fact in issue.

Rule 702. Testimony by Expert Witnesses

- (a) A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue.
- (b) Expert scientific testimony is admissible only if the court is satisfied that the expert testimony rests upon reliable scientific principles.

Rule 703. Bases of an Expert's Opinion Testimony

An expert may base an opinion on facts or data in the case that the expert has been made aware of or personally observed. Experts may testify to opinions based on inadmissible evidence, provided that it is of the type reasonably relied upon by experts in the field.

Rule 704. Opinion on an Ultimate Issue

- (a) **In General—Not Automatically Objectionable.** Testimony in the form of an opinion or inference otherwise admissible is not objectionable just because it embraces an ultimate issue.
- (b) **Exception.** Witnesses may not testify to opinions concerning intent, guilt, or innocence in a criminal case; the truth or falsity of allegations; whether a witness has testified truthfully; or legal conclusions.

Rule 705. Disclosing the Facts or Data Underlying an Expert's Opinion

Unless the court orders otherwise, an expert may state an opinion and give the reasons for it without first testifying to the underlying facts or data. But the expert may be required to disclose those facts or data on cross examination.

(IRE, 2014)

The preceding passage employs two main strategies to define expert witness. The first is *genus et differentium*, a classical definitional move which has its roots in as far back as Aristotle. In this strategy, a lexicographer describes a general class to which the item in question belongs and then describes how the item differs from the other members of that category. I point this out not merely as a curiosity but because this technique is used to delineate the special privileges expert witnesses have over other witnesses. In other words, IRE Article VII situates expert testimony within the general category of testimony offered as evidence *so that* it can describe how it differs from lay testimony. These privileges have tremendous implications for jury trials and for this study. For example, because Fishburn possesses the qualifications described in Rule 702, she was allowed to testify about whose DNA was found at in room 229 of the Travel Inn. Since it was necessary for the prosecution to prove the killers had the means and opportunity to carry out the crime, Fishburn's testimony on this point becomes indispensable to the prosecution's case. In a larger sense, this example raises the following two questions: 1. What are the unique merits of expert testimony in jury trials? 2. What are the relative merits of expert testimony in jury trials as compared with lay testimony? Although these questions are subsidiary to this project's main research goals, they must be kept in view. The prosecution designed Fishburn's direct examination to utilize both the unique and relative merits of expert testimony. Only a serologist or similarly qualified expert can offer an opinion about whose DNA is contained in a sample. As for placing the defendants in the room at or near the time of the murder, the prosecution decided to rely more heavily on Fishburn's testimony than the lay testimony of Michael Richard and Kimberly Ward, who both reported

seeing the defendants just outside the room near the time of death. Later in this chapter, I consider literature about the factors that contribute to or detract from an expert witnesses' credibility. These considerations become especially important in instances like this where lawyers choose to rely on expert testimony to prove a point even though non-expert witnesses could plausibly play a greater role.

The *genus et differentium* structure of this definition is also the basis of constraining the privileges afforded to expert witnesses. As per Rule 705, expert witnesses “may not testify concerning intent, guilt, or innocence.” Such testimony does not fit within the acceptable limits of the larger category of testimony offered as evidence; rather, determinations of guilt, innocence, or intent are legal renderings over which the jury has sole prerogative. For example, as per 704 (b), the prosecution could not ask Fishburn if Tony Steenbergen were innocent nor if Heidi Carpenter were guilty. On the other hand, as per 704 (a), Fishburn is allowed to testify that many samples from the scene contained Heidi Carpenter’s blood mixed with the victim’s blood even though such testimony has tremendous bearing on the “ultimate issue” of Carpenter’s guilt.

The second main definitional strategy IRE Article VII employs is to connect expertise with methodology. Rule 702 (b) requires that all expert testimony must rest on “reliable scientific principles.” Federal rules of evidence actually use the phrase “reliable principles and methods.” Although Indiana excised this explicit reference to methodology, a 2011 article in *Indiana Law Review* demonstrates on the basis of a considerable corpus of Indiana case law that methodology is included under the heading of “scientific principles.” In “Recent Developments in Indiana Evidence Law October 1, 2009—September 30, 2010,” Paul C. Sweeney and Emmanuel V.R. Boulukos cite several cases in which the Indiana Supreme Court considered

technical questions of scientific method in ruling on the admissibility of expert testimony (2011).

Regarding the term methodology, as with the term expertise, the legal field does not endeavor to philosophize about what the term means in the abstract. Rather, the legal field builds its definition of methodology one ruling at a time and with a typically pragmatic eye toward the question of whether an expert should be allowed present testimony based on a particular methodology. The rationale behind this definitional approach is two fold. First, there is strategic reticence about defining “sound methodology” which preempts lawyers and judges from overextending their legal expertise into scientific and technical realms. (Conversely, IRE 704 (b) ensures that scientists do not presume expertise in legal matters.) Second, this reticence serves the legal field's commitment to agonism as the best and fairest pursuit of justice. With no legal definition of sound methodology to constrain them, lawyers can build up the jury's confidence in a methodology during direct examination, as the prosecution did by letting Tonya Fishburn speak at length about STR testing. During cross examination, lawyers are free to challenge the soundness of any methodology, no matter how well established in scientific literature.

While a pragmatic, agonistic approach to defining methodology works well for the legal field's purposes, this study requires a comprehensive definition. Educational psychologist Jennifer C. Greene provided a particularly thorough definition in her 2006 article “Toward a Methodology of Mixed Methods Social Inquiry.”² Here, Greene constructs a framework which situates

2 Although Greene works in education, a field admittedly outside the scope of my project, the rhetorical occasion for which the article was written helps explain its relevance. It is the final piece in a special edition of *Research in the Schools* dedicated entirely to methodology. Commenting on what the special edition indicates about the state of the art of methodology in education, Greene developed a meta-critical framework which grounded her discussion of her colleagues' approaches to methodology.



Figure 1: Greene's Methodological Framework

said, “Domain 2 thus structures the inquirer's gaze, so that what is important to see (as defined in Domain 1) is observed, recorded, and understood or explained in defensible ways” (2006, p. 93). She then said that Domain 3 provides “a map” and “hiking boots” to equip the researcher to execute the research planned out in Domain 2 (2006, p. 94). As the diagram shows, Domain 4 transcends the pyramid structure that governs the first three. A portion of Greene's description of Domain 4 is worth reproducing in full to explain this departure:

Finally, in Domain 4, the location of the inquiry in society is articulated and defended...Domain 4 thus importantly directs the inquirer's journey toward a particular destination, as it identifies priority roles for social science in society and provides values-based rationales and meanings for the practice of social inquiry. *While values are present in all four domains, they are proclaimed in Domain 4.* (2006, p. 94, emphasis mine)

For Greene, then, Domain 4 encompasses both foundational and teleological dimensions of methodology. The diagram represents the multidimensional nature of Domain 4 by having it

methodology between epistemology and logistics. Her theory of methodology divides the concept into four domains and implies a spatial relationship among them. Figure 1 represents these relationships. The first three domains are represented as a pyramid-like structure to call attention to Geene's motif that each of the first three domains provides the basis for the subsequently numbered domain. For example, in describing Domain 2, Greene

encircle the entire structure built by the first three domains, suggesting that socio-political commitments simultaneously undergird, guide, and permeate epistemic and logistical considerations.

Greene's framework yields exceedingly useful insights for this study because it is finely attuned to the rhetorical implications of methodology. Immediately after describing her framework, she said the following:

“A methodology for social inquiry gains credibility and persuasiveness when all of these domains act in concert with one another, when their interlocking connections are smooth and well oiled, when the overall presentation is strong, coherent, well articulated and thus persuasive” (2006, p. 94).

It is important that Greene sees this framework as one that explains how a methodology *gains* credibility, rather than seeing it as an automatic means toward such an end. This stipulation helps avoid oversimplifications in rhetorical analysis of the role methodology plays in expert testimony.

Building on Greene's framework, I propose the following definition of methodology for use in this study: Methodology is discourse which justifies scientific practices or assumptions with reference to disciplinary standards or conventions. This definition deliberately attenuates methodology to a discursive phenomenon, a move that I grant does not suffice to describe how scientists utilize methodology in laboratories but which accurately reflects the transition scientists must undergo to function as expert witnesses. In the courtroom, researchers must rely almost entirely on their rhetorical acumen. Expert witnesses can present evidentiary displays to the jury, but these displays are only as effective as the expert's accompanying explanation. Expert witnesses can claim the methods they use are accepted by their fields, but as I will show

later in this chapter, they often must make this argument without reference to specific scholarly works. They must appeal more generally to the way things typically operate in their field.

Greene's framework, and the definition I have synthesized from it, are useful for this study because of their ability to shed light on features of expert testimony which might otherwise go unnoticed or unexplained by discourse-oriented analysts. Specifically, it helps one see that expert witnesses often defend their methodology by describing the relationships among the four domains of Green's framework, even if they do not use Greene's terminology. This is clearly the case in Fishburn's testimony. The vast majority of her direct examination consists of a description of her field's guidelines for practice—in this case, a list of the step-by-step procedures for performing STR testing. I am inclined to think the jury heard every bit as much about these procedures as they wanted, and that Fishburn may have risked losing them amid the tedium. However, Greene's framework also helps one see that Fishburn did make several important moves to highlight the coherence (and thus the persuasiveness) of her methodology. In its general shape, Fishburn's testimony begins with a description of the nature and properties of DNA; this description serves as what Greene calls the philosophical stance, and as Greene predicts, this philosophical stance undergirds Fishburn's inquiry logics and procedures. Her testimony emphasizes the uniqueness of each person's individual DNA profile (philosophical/epistemic stance), then explains that this uniqueness is identifiable by the repetition of certain patterns (inquiry logic), and then describes how these patterns are detected (guidelines for practice). Finally, Greene's framework suggests that even though Fishburn does not overtly reference her socio-political commitments, they permeate the totality of her testimony.

Thus far, I have applied Greene's framework to Fishburn's testimony to offer an extended case in point about the framework's utility as an analytical tool. As a serologist, Fishburn focuses on methodologies underlying DNA testing, and so my analysis of her testimony maintains a similarly narrow focus. However, Greene's framework can be applied to methodologies in any discipline. This perspective is important because jury trials often feature testimony from experts representing a vast array of disciplines, including forensic pathology, psychology, ballistics, and chemistry. An expert witness from any of these disciplines would face the same general challenges in making his or her methodologies clear and persuasive to the jury. The specific challenges, though, depend on the discipline itself. The work of philosopher Stephen Toulmin provides insights regarding these unique challenges. Toulmin billed himself as a theorist of disciplinarity, and this theme indeed unites the many works he produced over a four-decade span. In his first book length project, *The Uses of Argument*, Toulmin introduced a system for identifying structural features of arguments. Toulmin contends that identifying such structures highlights the unique features of arguments within a given discipline (1958, pp. 16–7). His framework thus sheds light on the unique communicative challenges an expert witness faces in explaining his or her discipline's methodology.

The five key concepts of Toulmin's framework are claims, reasons, grounds, warrants, and backing. Toulmin called his system a jurisprudential model of knowledge-making, and, not surprisingly, each of these five concepts has a close corollary in the legal field. The specific wording of IRE Article VII highlights these corollaries. First, what Article VII calls an “opinion” differs significantly from the normal usage of the term. In this legal context, “opinion” means a conclusion or inference an expert witness arrives at after a consideration of available data. In traditional rhetorical parlance, we might call it a thesis. In the courtroom, as Fishburn's testimony exemplifies, an opinion might take the form of a forensic scientist

testifying about whose blood was found at a crime scene. This legal definition of “opinion” closely resembles what Toulmin called “claims.” He specified that within his scheme, claims are both argumentative and probabilistic (1958, p. 97). They are often, like the legal gloss of opinion, data-supported inferences. Toulmin's term for data is “grounds,” and by his own account, this term has a close analogue in the legal field—evidence (1958, pp. 97–8).

The main feature of the Toulminian scheme I focus on in this study is the warrant. Toulmin defines warrants as “standards or canons of argument” which are themselves neither claims, data, nor conclusions. They authorize the use of a certain kind of data to draw a certain conclusion” (1958, p. 98). His central point is that warrants are not universal; instead, they often remain tightly cloistered within a certain academic discipline. Consequently, one would typically see how warrants function by looking at discipline-specific literature, especially journals and conference proceedings. While exploring such documents, a reader would still be well advised to remember that warrants become embedded in the methodology of a field. Warrants thus tend to become highly routinized to the field's practitioners and yet esoteric to everyone else—even scientists from other fields. For example, a 2011 article in the *International Journal of Legal Medicine* called “Effects of humic acid on DNA quantification with Quantifiler® Human DNA Quantification kit and short tandem repeat amplification efficiency” proposed a new means of improving the accuracy of STR testing kits used to process crime scene samples. The article began by glossing STR as “a useful technology for identifying individuals in forensics,” (Seo et al., 2012, p. 961). But then it immediately switched registers and discussed STR in terms every bit as hieratic as the title portends. The authors assumed such a high level of familiarity with STR on the part of their readers that no discussion of STR's current reliability was necessary as a precursor to their discussion of how to improve its reliability. To couch their thesis within Greene's framework, the authors argued

they have discovered new and improved inquiry logics whose reliability they can demonstrate. In Toulmin's parlance, this is called a “warrant-establishing” argument because it contends for the existence of a new justification for drawing a certain kind of conclusion based on a new type of grounds (1958, p. 120). Such arguments are essential to the advancement of science, Toulmin claimed, and the ability to engage with them is a key feature of belonging to a discipline.

So while Tonya Fishburn could have easily engaged with the previously mentioned scholarly article, if she had adopted its level of methodological sophistication (and the corresponding level of lexical sophistication) in her testimony, she might as well have said, “You'll never understand this science; you'll just have to trust me.” In a jury trial, Toulminian warrants function in a unique way. Whereas experts normally only argue about the soundness of a given method in their journals or at their conferences, and in as much complexity as the discussion requires, a jury trial requires experts to voice the same arguments in public and in terminology the jury can understand. In other words, a jury trial requires scientists to function simultaneously as rhetoricians and researchers. This is the discursive phenomenon I wish to study in this project.

1.3 DEPLOYING EXPERTISE IN THE COURTROOM: COMPETITION, CONTROL, AND CREDIBILITY

The legal field is of course itself a discipline, complete with its own methodologies. Foremost among the socio-political commitments permeating all facets of its methodologies is the principle that agonism provides the fairest means for pursuing justice. In jury trials, therefore,

expertise is deployed like a weapon, or at least like a tool. Fishburn's testimony, though somewhat verbose and far-ranging, served only one purpose: to aid the prosecution's case by establishing the identity of people whose DNA was at the crime scene. This typifies the sharply defined rhetorical goals lawyers have in mind when they utilize expert witnesses. While cross examining the opposing side's expert witnesses, lawyers pursue correspondingly agonistic aims, except here, the goal is likely to raise doubt about the content of the testimony or to undermine the expert's credibility. The following review of literature treating the actual practices of using expert testimony in jury trials focuses on the ways this agonistic environment both empowers and constrains the ability of expert witnesses to discuss methodology. The review is organized around three salient themes that emerge from the literature: competition, control, and credibility.

1.3.1 Competition

Although the ostensible role of an expert witness is simply to offer specialized testimony, the rhetorical role of an expert witness is often to compete against an expert witness of the same discipline called by the opposing side. According to historian Tal Golan, the rules that govern today's expert vs. expert competitions are best understood by looking all the way back to the rise of empirical science in Enlightenment Great Britain (2008, p. 879). In his symposium presentation "A Cross Disciplinary Look at Scientific Truth: What's the Law to Do," Golan claimed that in England, judges exercised unilateral authority over the selection and presentation of all evidence. This held true even though observation-based science, which Bacon had championed more than a century earlier, had begun to result in nascent forms of specialization (Golan, 2008, pp. 882–3). This stress on empirical observation meant that an expert witness' testimony was valid only insofar as it was based on observations or experiments

conducted by the witness himself.³ Golan noted that eventually, science in Great Britain would outgrow Baconian boundaries:

By the late eighteenth century, however, a new culture of expertise began its rise to dominance, which defied this [Baconian] epistemology. This was the culture of science, confident in its ability to discern the hidden laws of nature, however subtle their workings were. At the start of the eighteenth century, this was still a bookish culture that studied nature in general, but by the end of the century it had narrowed its focus to the inanimate world, supplemented books with experiments, borrowed some mathematics, and gave indications of practical utility. Its practitioners, who styled themselves men of science (the word "scientist" was yet to be invented) or Newtonian philosophers (after their great leader, Isaac Newton), may have still theorized like natural philosophers, but they increasingly acted like skilled professionals. They reasoned from first principles but concerned themselves with the observable, the measurable, and the practical. By the end of the eighteenth century, they became central to Britain's booming economy – revolutionizing agriculture; inventing and improving engines, pumps, and other machinery; designing and overseeing the construction of waterways, bridges, and harbors. It was not long before the courts were asked to consider the status of these new experts in the courtroom. (2008, pp. 886–7)

Central to Great Britain's economy though these new expert witnesses may have been, they still stood apart from it—or more precisely, above it—due to their status as landed gentlemen.

Golan explains that an insoluble tension arose between the gentlemanly status of these expert witnesses and the increasingly partisan, adversarial roles they were required to play in jury trials (2008, p. 909). In an age characterized by confidence that results produced through direct

3 I have purposefully avoided gender parity here to reflect the systematic exclusion of women from these sorts of scientific practices that existed at this time, as thoroughly documented by, among many others, Donna Haraway. A fuller discussion of the class, gender, and racial dynamics of the use of expert witnesses appears later in this section.

observation were trustworthy and generalizable, more than a few public commentators wondered how two gentlemen-scientists could testify, under oath, to having radically divergent opinions on the same issue. Foremost among these commentators was John Locke. Golan cited a particularly pontifical passage from Locke's treatise *Some Thoughts Concerning Education* which names lying a sin that irrevocably costs a man his genteel standing (2008, p. 903).

The problem of social status and scientists as adversarial witnesses would cross the Atlantic and enter American courtrooms, Golan contended, but there it took almost the opposite form. If in Great Britain, the problem had been creating space in court for gentlemen-scientists to have *bona fide* disagreements without forfeiting their social status, in American courts the problem arose from the Jacksonian prejudice that all white males possessed full competence in all skills needed for all civic duties (2008, p. 919). In the mid nineteenth century, the use of expert testimony in American jury trials increased dramatically, Golan said, in accordance with tremendous scientific advancement throughout the nation. Consequently, an automatic granting of limitless competence to white males remained entrenched even as juries' fact-finding missions grew increasingly technical. Not surprisingly, Golan characterized this period and the seventy years that followed as one of chaos. Judges had no real prerogative to screen, assess, or curtail expert testimony. Any self-proclaimed expert, touting evidence based on any methodology, was free to join the fray (2008, pp. 920–1).

The chaos did not abate significantly until the 1920's, Golan contended (2008, p. 927). In 1922, a Washington D.C. court heard the case of James Frye, an African American man accused of murder. Frye's lawyer wanted to utilize a brand new technology—a polygraph test. None had ever been used in court before. Frye's lawyer called one of the inventors of the polygraph to testify as to the soundness of the results, which in this case, indicated the truthfulness of Frye's

denial of the charge. The trial judge excluded the polygraph results, as did the Washington D.C. court of appeals. The appellate court, Golan explains, offered a more sophisticated justification of their decision, and their rationale would set an important precedent for the next seventy years (2008, p. 927). The appellate court framed the “general acceptance” standard, which requires that a technology have widespread approval among practitioners of the discipline(s) to which the technology pertains before evidence produced therefrom can be offered in court. Golan contended that this decision turned the focus away from the personal credibility or status of an expert witness while intensifying attention on the methodology underlying the evidence (2008, p. 930). Consequently, Frye helped set the stage for the sort of expert vs. expert competitions which now typically occur in jury trials in which experts duel over whose methodology is better or which methodology should be trusted in a given situation. Indeed, this ruling would eventually give rise to the language incorporated into the Federal Rules of Evidence regarding expert testimony (2008, p. 933). As previously mentioned, many states, including Indiana, subsequently adopted this language.

Whereas the Frye case set the stage for today's expert witness competitions, a case in 1993 brought them into their current form. According to Golan, a civil suit against the pharmaceutical giant Merrell Dow contended that one of their anti-nausea drugs intended for pregnant women caused birth defects ((2008, p. 934). Lawyers for the plaintiffs had expert witnesses ready to testify about the drug's dangers, but the judge excluded their testimony in part because the experts had conducted a fresh meta-analysis of relevant data just for presentation in the trial. The case, named *Daubert* after one of its plaintiffs, eventually went to the U.S. Supreme Court. The Court treated *Daubert* as an indication that greater clarification was needed in all cases utilizing expert testimony, and so they sought to further codify admissibility standards. *Daubert's* lasting impact, Golan explained, is that the admissibility of

expert testimony would subsequently be considered according to the following four criteria: “testability, peer review, standardization, and general acceptance” (2008, p. 935). These new criteria underlie the current emphases on disciplinarity and methodology which now characterize expert testimony.

Because these criteria give judges reasons to exclude (rather than just evaluate) expert testimony, these criteria also shape the uniquely pugilistic expert vs. expert contests that happen in court but not (likely) in scholarly journals or conferences. In their article “Appropriate Use of Scientific Literature At Trial In New York And Other Jurisdictions: Is "Authoritative" A Magic Word?” Michael W. Kessler and Christine A. Caputo contended that *Daubert* had the unintended effect of making it harder than it had previously been to incorporate scientific literature into jury trials (1997). No matter how relevant to the case at hand, scientific literature is classified as hearsay unless it was produced specifically in response to that case (Kessler & Caputo, 1997, p. 188). For example, Tonya Fishburn limited her testimony to discussing her specific use of STR testing in the Heidi Carpenter case. A wider discussion of its reliability, no matter how well founded on extant literature, could have been objected to as hearsay. Kessler and Caputo also explained that many expert witnesses may not want to have scholarly sources cited in court. In these instances, admissibility standards which grew out of *Daubert* make it difficult for the opposition to mention these sources during cross examination (1997, pp. 191–4). Consequently, when expert witnesses compete in court, they fight bare knuckle: limited access to scholarly literature, no revisiting the laboratory to check results, no courtesy or collegiality except that required by the rules of witness examination.

In light of these contentious circumstances, Golan's sensitivity to the socioeconomic dynamics surrounding expert testimony takes on new significance. With very few exceptions, only professional scientists or academicians serve as expert witnesses. It follows, then, that an unofficial but effective requirement of being an expert witness is having a professional reputation solid enough to survive the strife of being vociferously contradicted by a colleague and the embarrassment of being tripped up during cross examination. (Lawyers' chicanery in pursuit of this goal knows no limits, as the next section will show.) In order to have such an ironclad professional reputation, it is likely that a scientist or academician must already have achieved a high level of job security. Therefore, the question of who can be an expert witness is still tied, as it was in Enlightenment Great Britain, to the factors which shape career advancement. Any type of prejudice inhibiting inclusion or advancement in scientific education and workplaces forecloses possibilities for diversifying the pool of expert witnesses.

As Donna Haraway shows, these prejudices work powerfully against women. In her book *Modest_Witness@Second_Millennium: FemaleMan Meets OncoMouse*, Haraway traces the systematic exclusion of women from science to the same historical setting with which Golan begins: Enlightenment Great Britain (1997). Building on the work of Steven Shapin and Simon Schaffer, Haraway points to the exclusionary practices that characterized the operations of Robert Boyle's laboratory. There, Boyle's own sisters were not permitted to watch experiments with his newly invented air pump even though Boyle esteemed their intellects in other respects. In that age, Haraway surmises from Shapin and Schaffer, an experiment was not valid unless witnessed. The idea that a scientist could, through writing, express his experimental methods in enough clarity and detail to make them reproducible had not yet taken hold. Therefore, Haraway concludes, to exclude someone as a witness was to banish her from organized science altogether (1997, pp. 23–5). Haraway's project, although it begins with an historical orientation, is mostly concerned with current trends in the sociology of science. She

contends that from the Enlightenment forward, only those privileged enough to participate in scientific experimentation have enjoyed the concomitant privilege of invoking claims of objectivity in scientific discourse (1997, p. 25). In other words, the idea that results speak for themselves is an aristocratic rhetorical construct. Haraway sees this privilege as one that has carried forward to the present day, perpetuated in large part by the cloistered nature of government-funded science (1997, pp. 25–6). It seems a safe conjecture that Haraway's critical approach would expose similar forms of discrimination regarding all demographic factors.

Then, there is the question of access to expert witnesses. They do not work for free. Law enforcement agencies have large budgets to employ a cadre of full-time scientists from a variety of disciplines who serve as expert witnesses for the prosecution, but defense lawyers must fend for themselves. High profile law firms may well have the funds needed to fight fire with fire, but public defenders rarely do. Tonya Fishburn, for example, testified for the prosecution only; Heidi Carpenter's public defense lawyer did not call a serologist (or any type of expert, for that matter) presumably due to financial constraints. So, the competition between expert witnesses, like all high-stakes, high-cost competitions, exposes prejudicial dynamics which may remain hidden otherwise. A consideration of these dynamics is not merely an excursus; it is central to understanding who may be or utilize an expert witness.

1.3.2 Control

Expert witnesses compete *against* one another, but they compete *for* the jury's trust. To seem trustworthy, their testimony must seem coherent. The appearance of a coherent methodology, Greene contended, is a rhetorical effect best achieved by explaining the relationships between one's epistemology, inquiry logics, and procedures. But in jury trials, expert witnesses only have as much leeway to explain and justify their methodologies as lawyers grant them. This

can be very little leeway indeed. A 2011 article in the trade magazine *Indiana Lawyer* offered this unapologetically directive advice:

When it comes to witness control expert witnesses just like lay witnesses need to be managed. This is often achieved through the same techniques, [as those used on lay witnesses] however some other special issues also need to be considered when examining experts. Never 'turn over the floor' to the adverse expert witness. The expert will take the opportunity to "teach the jury." And will no doubt win the credibility battle." (Kautzman, 2011, commas missing in the original.)

The preceding article and several others from the same publication advised being just as controlling with your own expert witnesses as with adverse ones. The rationale for exerting this level of control emerges from the previously mentioned commitment to agonism which pervades the legal field. "Filing a law suit is like declaring war," according the main character of the legal drama *A Civil Action* (Hall & Zaillian, 1999). In order to win the war, lawyers believe, a well-crafted plan is needed that orchestrates how each aspect of case, including expert testimony, will unfold.

Within legal scholarship, one can find evidence of an awareness of the limitations of such a tightly constrained (and constraining) view of rhetoric. In "Rhetoric and Its Denial in Legal Discourse," an article noteworthy for being both introspective and meta-analytical, law professor Gerald B. Wetlaufer claimed:

The irony is in the fact that, on the one hand, law is the very profession of rhetoric. We are the sons and daughters of Gorgias himself. But if law is, at its core, the practice of rhetoric, the particular rhetoric that law embraces is the rhetoric of foundations and logical deductions. And that particular rhetoric is one that relies, above all else, upon the denial that it is rhetoric that is being done. Thus, the rhetoric of foundationalism is

the essence of philosophy and the antithesis of rhetoric. If, as I suggest, law is rhetoric but the particular rhetoric embraced by the law operates through the systematic denial that it is rhetoric, then it should come as no surprise that difficulties sometimes confront us. (1990, pp. 1554–5)

The difficulties Wetlaufer elaborated upon include significant limitations in situations which call for negotiation rather than confrontation, pedagogical heavy-handedness, and the stunting of creativity in legal scholarship. This final difficulty is particularly pertinent to the question of how (indeed, if) expert witnesses discuss methodological issues. Wetlaufer identified the demand to find clarity in all texts and an impatience to find the one right answer as inculcated characteristics which ultimately impede lawyers' ability to handle complex issues (1990, p. 1590). In this mindset, what would encourage lawyers to take the time to understand the methodologies their expert witnesses use to generate or analyze the evidence they present? What would encourage lawyers to allow expert witnesses to discuss the probabilistic, complex, and contingent nature of their conclusions? In an environment where rhetoric itself must be controlled so as to make it invisible, there is little freedom to display the messiness and uncertainties of science. In this environment, an interesting and important verbal irony arises surrounding the word "opinion." Whereas IRE 702 tightly constrains "opinion" to mean a conclusion based on analysis of data, the scientists serving as expert witnesses may, due to their own disciplinary orientation, not think of their conclusions as opinions at all but as pure science. Presumably, lawyers want expert witnesses in their employ to display this level of confidence in their opinions.

1.3.3 Credibility

Christina Summers offered this real life courtroom anecdote in an *Indiana Lawyer* article:

Your expert is on the stand. He's done everything you'd hoped thus far. Then, opposing counsel pitches a question from left field.

"How far to the nearest grocery store?" she says.

You watch your expert go pale and begin fidgeting. He stammers and pauses, then begins again.

"Two or three miles," he says, visibly shaken.

"Which is it two or three?" opposing counsel forces.

Your expert tries to explain but it's too late. He looks unprepared and has lost credibility in the eyes of the jury.

Sound like an expert witness horror story? It was for Richard Nichols, a commercial real estate appraiser and expert witness in the Indianapolis area. Some 20 years ago, this same situation happened when he took the stand.

"A novice mistake," he said. "Time teaches that if you don't know don't become shook up just say: 'I really don't know.' You've got to establish credibility." (1999)

While judges have *Daubert* to guide their sense of an expert witness' credibility, lawyers have only the rules of trial proceedings to restrain them from attacking that credibility. As the previous anecdote shows, these rules give lawyers tremendous freedom.

Surprisingly few rhetorically-oriented scholars have undertaken studies of how this freedom is used as manifested in the techniques used to build up or tear down an expert witness' credibility. The oldest such study—indeed, the only one of its specific kind—I have found is a 1983 doctoral thesis by Dawn Denise McLario, a graduate student in Purdue's communication department. In *Professionals under Fire: The Courtroom Rhetoric of Establishing and*

Challenging the Credibility of Expert Witnesses in the Malpractice Suit, McLario conducted a case study of what was then a recent major medical malpractice suit in Wisconsin. Although McLario theorized a concept of ethos based on Aristotle and Kenneth Burke, she primarily relied on Toulmin to guide her observations about what actually occurs once the experts, mostly physicians in this case, take the stand. McLario employed the previously discussed concepts from *The Uses of Argument* to identify the overall structures and constituent components of the arguments presented by both sides. McLario found in Toulmin's work a means of systematic analysis, but her case study was hampered by an erroneous understanding of Toulminian warrants. Perhaps owing to the emphasis on Aristotle which characterized her project's functional definition of ethos, McLario treated warrants as if they were merely the minor premise of a syllogism. For example, in charting the structure of the overall argument the plaintiff's lawyers used to claim the defendant was both negligent and liable, McLario presented the following outline:

EVIDENCE: The plaintiff (through no fault of his own) has incurred considerable medical expenses and will continue to do so throughout his lifetime.

WARRANT: According to the law, the plaintiff is not required to pay for his injuries (or related expenses) if they were proximately caused by someone else's negligence.

CLAIM: [Therefore], the plaintiff should be compensated for his negligently-caused injuries. (1983, p. 174)

Although warrants can be mapped syllogistically, their role as a minor premise in a syllogism is not what makes them a warrant. In the above example, what McLario labeled a warrant is simply a condition prescribed by law under which a patient is excused of paying for treatment, and it indeed functioned in context as a formally valid minor premise. But in Toulmin's

framework, an idea is a warrant only if it explains why a certain kind of evidence is acceptable proof for a particular claim.

Given Toulmin's emphasis on discipline-specific ways of knowing, his real hope was that a warrant explains *to whom* a certain kind of evidence is acceptable proof. While McLario acknowledged the discipline-specific dimension of warrants, her conflation of warrants with minor premises prevented her from recognizing discipline-specific epistemologies manifested in argument structures. Instead, she classified warrants based on the subject matter most relevant to the point at hand. She thus classified the “warrant” in her example above as a “legal warrant.” Similarly, she called the the defendant's contention that "nothing could be done to treat or alter [the patient's] condition from the time the injected dye came in contact with his spinal cord" a “medical warrant” (1983, p. 191)). In Toulmin's framework, this statement is a claim, not a warrant, but that is almost moot. What matters—the key insight to be gleaned by applying Toulmin's framework to legal settings—is that as jurors listen to the dizzying array of technical terms and quantitative reasoning which permeate expert testimony, jurors must also contend with the fact that each area of expertise derives conclusions from data in its own unique way. McLario had a tremendous insight in using the theory of the warrant to discuss an expert witness' credibility. But, her attempt fell short of its potential due to an over-attenuated treatment of Toulmin's complex, nuanced concept.

1.4 CONCLUSION

By examining the rules that govern expert testimony and by offering historical context for current practices regarding expert testimony, I have shown that jury trials are a prime setting in which to apply Toulmin's theory of the warrant. In the next chapter, I offer a brief consideration of rhetoric and composition's theoretical orientation toward expertise as a precursor to

presenting my plan for using Toulmin's theory to study the methodological component of expert testimony.

CHAPTER 2: THE DISCIPLINARY ORIENTATION, METHODOLOGY, AND DESIGN OF THIS STUDY

2.1 INTRODUCTION

This chapter answers two questions: 1. Why should rhetoric and composition study the rhetorical moves expert witnesses utilize to explain scientific methodology to juries? 2. How will this study pursue its research questions? In answering the first question, I review literature that has shaped rhetoric and composition's theory of expertise. I contend that this field's theories of expertise can meaningfully be brought to bare on the strategically sparse definition of expertise used in the legal profession. I also review literature by major figures in rhetoric and composition—specifically in the sub-discipline of technical communication—whose works have illuminated the rhetorical and argumentative practices of both scientists and lawyers. I demonstrate that my project fills a gap in existing scholarship by specifically examining how scientists argue within the constraints of the courtroom.

To answer the second question, I describe the methodology and design of this study. I construct a qualitative coding system that is suited for identifying features of Toulmin model of argument as they are expressed in the question and answer format of witness examinations. In the first phase of this study, I apply this coding system to portions of court transcripts featuring expert testimony. In the second phase, I use results gleaned from phase one to guide my interviews with experience in cases involving expert testimony.

2.2 DISCIPLINARY ORIENTATION

“We are the sons and daughters of Gorgias himself” law professor Gerald B. Wetlaufer says of his profession (Wetlaufer, 1990, p. 1554). I readily grant this. But in a move Gorgias might appreciate, I contend that the criteria Wetlaufer uses to argue for law's close kinship with rhetoric apply to a variety of professions and disciplines. As I discussed in the previous chapter, Wetlaufer maintains that rhetoric occupies a central role in the legal field's routine operations, that rhetoric functions in a discipline-specific way, and that lawyers have (or should develop) the capacity for meta-critical perspectives on rhetoric, including the ability to discern when rhetoric must deny its own existence to operate effectively. Using these three criteria, one could make a cogent case that speech-communications, psychology, and philosophy possess the rhetorical savvy needed to conduct fruitful examinations of expert testimony in jury trials. I hope scholars from these fields articulate such cases.

For my part, I merely wish to demonstrate that my home discipline, rhetoric and composition, possesses a theoretical depth and topical breadth that make it an apt disciplinary perspective from which to conduct the specific study I propose later in this chapter. I therefore begin with a review of works offering perspective on the historical development rhetoric and composition's theory of expertise. Then, I examine two particularly influential studies that tethered the notion of expertise to the production of specialized texts. Next, I review several works by rhetoric and composition scholars who have chosen the legal field or settings in which legal proceedings occur as their object of study. Finally, I show that my study addresses a gap between these three strands of scholarship because of its approach to analyzing specific rhetorical features of expert testimony.

2.2.1 Historical Perspectives on the Development of a Theory of Expertise

Expertise, a concept born of modernity and problematized by postmodernity, does not appear in texts of the classical era. Nonetheless, such texts are indispensable in understanding how expertise is currently conceptualized by rhetoric and composition scholars. I will therefore trace the development of our notion of expertise by examining related concepts such as ethos, logos, disciplinarity, and the public sphere.

Ethos seems the obvious place to begin, but an examination of Aristotle's treatment of this concept in *On Rhetoric* demonstrates important divergences between ethos and expertise. Before Aristotle treated ethos directly, he clearly delineated rhetoric's purview in a way that separates rhetoric from expertise. A passage from Book One, Chapter Two explained:

Let rhetoric be [defined as] an ability, in each [particular] case, to see the available means of persuasion. This is the function of no other art, for each the others is instructive and persuasive about its own subject: for example, medicine about health and disease and geometry about the properties of magnitudes and arithmetic about numbers and similarly in the case of the other arts and sciences. But, rhetoric seems to be able to observe the persuasive about “the given,” so to speak. That, too, is why we say it does not include technical knowledge of any particular, defined genus [of subjects]. (2006, pp. 37–8)

It would be remiss not to mention that medical specialists, the first type Aristotle excluded from rhetoric's purview, are now among the most likely to serve as expert witnesses. More relevant to the present point, though, is Aristotle's assumption that knowledge of a technical discipline is a sufficient condition to speak persuasively on that subject. Conversely, he denied that rhetoric has a contribution to offer such rhetors. Not coincidentally, this sharp circumscription of rhetoric's purview appears just before *On Rhetoric's* first direct treatment of

ethos, which is defined as a speaking in manner that garners credence, especially in cases “where there is not exact knowledge, but room for doubt” (2006, p. 38). In this context, “exact knowledge” does not mean technical or precise knowledge, but rather indirect or incomplete knowledge. The possibility that rhetoric could aid one's attempt to be persuasive while speaking on technical subjects—a possibility already precluded by Aristotle's view of disciplinarity—never entered his consideration of ethos. In Book 2, Chapters 12 to 17, Aristotle offered his fullest exposition of ethos. There, he extolled adaptability as the key virtue. He admonished his students to note major demographic features of their audience, particularly their age and social standing, and to adjust their personae according to generalities associated with these demographic categories (Aristotle, 2006) Conspicuously absent is any advice about how to adjust one's presentation of specialized knowledge in light of an audience's demographics.

Just as Aristotle's conceptions of disciplinarity and ethos preclude modern and postmodern notions of expertise, so too does his conception of logos. This is particularly clear in his teachings on the structure of logical argumentation. In describing how enthymemes function, Aristotle warned his pupils to be wary of the difference between enthymemes built on refutable proofs and those built on irrefutable proofs. Irrefutable proofs (*tekmerion*) are so named because they describe a specific instance of a universal, unalterable relation. Aristotle offered as an example the proposition that if a woman is lactating, she has given birth. Such statements, he claims, are true beyond any probability (2006, pp. 42–3). In Aristotle's overall theory of rhetoric, *tekmerion* operate within the scope of the everyday matters over which rhetoric has domain and hence outside the special purview of academic disciplines. *Tekmerion* are manifestly obvious and universally accessible. No specialized training is needed to formulate arguments based on irrefutable proofs, and by definition, they foreclose further argument even

from people with specialized knowledge. Although this may have been a suitable notion of logos for a pre-scientific culture, it is vastly unsuitable in modern and postmodern contexts. When Tonya Fishburn testified that blood samples from the crime scene belonged to Heidi Carpenter, was she not employing rhetoric? On the other hand, were her proofs—which delved into the intricacies of STR testing—self evident or universally accessible?

Rhetoric and composition scholars have played a major role in developing theories of rhetoric that acknowledge the complexities arising from scientists' elevated social status, their hieratic lexical and argumentative practices, and their often problematic public images. A prominent body of scholarship within this effort is grouped under the heading of public rhetoric. Although public rhetoric scholarship touches on a vast variety of topics, it is bound together by its interest in how rhetoric operates in a fractured, stratified, postmodern society. An influential work among public rhetoric scholars is Michael Warner's 2002 book *Publics and Counterpublics*. It offered a robust theory of public rhetoric that attends to the effect of social inequalities on the production and dissemination of discourse. This theory becomes the framework through which he examines a series of historical and contemporary social contexts in which various groups have been granted or denied access to publicity. Warner focused on gender and sexuality throughout this book because they have so frequently been factors for exclusion in Western history. Taking his cue from the common etymology of “public” and “pubic,” Warner showed that even in antiquity, debates about gender often intersect with debates about who should have access to public fora (2005, p. 23). This observation motivated his overall goal, to “get beneath our intuitive sense” about what a public is (2005, p. 11). Warner contended that the failure to critically interrogate this question has left theorists less able to counter exclusion by hegemonic groups. In his quest for a more nuanced sense of the category of public, Warner investigated different ways it has historically been distinguished

from the category of public, and for this, Warner turned primarily to Jürgen Habermas. Warner conceded that many of Habermas' critics have convincingly taken him to task for a variety of analytical oversights and problematic assumptions, but Warner nonetheless appreciated Habermas' account of the rise of the economic conditions that imbued the term "private" with the economic connotation it still carries today. This is important for Warner's overall project, because he contended that just as economic interests are divided, so are publics; there is not one monolithic public, but many publics. What, then, binds a public together? Warner insisted that a public is created by discourse and exists for the sake of discourse (2005, p. 68). Publics are culturally bound, and in practical terms, their members must traffic in shared genres and be able to shape an author's expectations through the possibility of circulation and interlocution (96). Framing publics in this way allowed Warner to introduce the concept of the counterpublic, which he defined as a group "structured by different dispositions or protocols form those obtained elsewhere in the culture, making different assumptions about what can be said or what goes without saying" (2005, p. 119).

Warner's concept of publics and counterpublics has several ramifications for my project. It highlights a difficulty expert witnesses likely encounter in addressing the jury which the law itself is built to elide. For legal purposes, a juror need only be a member of *the* public, and the public is simply the citizenry. In the U.S., most states list a set of demographic criteria which jurors must meet. In Indiana, they are as follows:

- (a) a citizen of the United States;
- (b) at least eighteen (18) years of age;
- (c) a resident of the summoning county;
- (d) able to read, speak, and understand, the English language;

- (e) not suffering from a physical or mental disability that prevents him or her from rendering satisfactory jury service;
- (f) not under a guardianship appointment because of mental incapacity;
- (g) not a person who has had rights to vote revoked by reason of a felony conviction and whose rights to vote have not been restored; and
- (h) not a law enforcement officer, if the trial is for a criminal case. (Indiana Rules of Court, 2014, p. Rule 5)

Through the framework of publics and counterpublics, one can easily foresee the difficulties of treating a group of twelve people fitting only these criteria as constituting a public. An expert witness, although barred from contact with jurors save that occurring in the courtroom, must try to explain his or her science without knowing anything about the jurors' education levels, epistemic assumptions, or ideological commitments. Whereas Warner draws attention to the tendency of heterogeneous societies to fracture and coalesce into smaller units along the lines of shared literary practices and shared senses of identity, U.S. law still operates on an essentially Athenian notion of the public.

This is a highly exploitable notion of the public, as lawyers well know. Rachel Harris' 2008 article "Questioning the Questions: How Voir Dire is Currently Abused and Suggestions for Efficient and Ethical Use of the Voir Dire Process," which appeared in *The Journal of the Legal Profession*, identified several problematic practices surrounding jury selection.

According to Harris, lawyers drag out the voir dire process unnecessarily, and they sometimes use it as an opportunity to orate, regaling the potential jurors with portions of their opening statements before the trial has begun (2008, pp. 321–2). Harris argues these practices clearly violate several provisions of the legal field's official code of ethics. Harris' main concern,

however, are jury selection practices which violate the Constitution. She points to the vast prerogative lawyers are given to exclude potential jurors as particularly problematic:

After attorneys either conduct voir dire or submit questions to the judge during court-directed voir dire, the attorneys must strike the jury. Attorneys usually are given unlimited ability to strike jurors for cause, but attorneys are given a limited number of preemptory strikes or challenges. When used correctly, these strikes seek to eliminate jurors biased against the lawyer's case. When used arbitrarily or incorrectly, the strikes may eliminate poor, rich, minorities, and more educated members of the jury pool. Most scholars do not consider these practices, reducing the diversity of juries and reducing juries' collective intelligence, desirable, as it reduces the collective knowledge and experience brought into the jury room. Ineffective jury selection may violate the Model Rules, if it is not done in the best interests of the client or if a strike is made for an unconstitutional reason, such as race. (2008, pp. 322–3)

According to Harris' analysis, as lawyers manipulate the voir dire process, they consider many of the factors which Warner says constitute a public. Yet this public, which lawyers have shaped for their own purposes, is still considered by the legal system a fair representation of *the public*.

Lawyer's manipulation of the voir dire process is an example of Wetlaufer called the legal field's denial of rhetoric; lawyers need not state their rationale for the way they select or craft their questions. In the field of rhetoric and composition, scholars have referred this type of rhetoric as invisible rhetoric. Carolyn R. Miller's 2010 book chapter "Should We Name the Tools: Concealing and Revealing the Art of Rhetoric" traced a long-standing debate in the history of Western rhetoric about whether rhetoric is most effective when it calls attention to its aims and methods or whether rhetoric operates most effectively under the guises of sincerity

and clarity. Miller's purpose was not to weigh in on the debate directly, but rather to trace its development from ancient Athens to the 2008 Presidential election, where, she contended, this debate is both as vexing and as germane as ever. Miller claimed that theorists on both side of the debate agree that the simple fact that rhetoric can be displayed or concealed means that genuine sincerity often gets chalked up as sophistry, and that in a broader sense, rhetoric's chameleon-like properties can hamper society's ability to get anything done. So, while Miller did not attempt to join the debate, she did want to point out in light of its high stakes and its apparent interminability, “We might conclude that despair is the only recourse—or cynicism” (2010, p. 30). Unwilling to resign to this position, Miller instead wrestled with the following question: “What can rhetoric's public role be under these conditions?”(2010, p. 30). Part of her answer involved drawing attention to the cost an academic discipline incurs by aligning itself with either side. Cognizant that rhetoric and composition scholars are likely to think of their discipline as able to view this debate entirely from the sidelines, Miller quipped, “we have concealed rhetoric as composition, as cultural studies, as literature, as literacy, as professional communication” (31). Miller contended that the cost of having aligned ourselves with a rhetoric of concealment, at least in terms of the public presentation of our discipline, is a degradation of our ability to affect change outside the academy (2010, p. 31). Miller's treatment of this debate highlights challenges inherent in my project. In essence, I am attempting to name the rhetorical tools used by scientists (who may not even acknowledge rhetoric's existence) as they testify in court (where lawyers typically take great pains to conceal rhetoric's role). But to abandon such a project due merely to these challenges would be to give into the cynicism Miller admonished her colleagues to overcome.

To Toulmin's insights about the rhetorical nature of science, Warner and Miller added that publics are built of discursive practices and that rhetoric can alter its visibility. These three

insights become key operating assumptions for this study, as I will expound on later in this chapter. They are also useful assumptions for commenting on two major studies which solidified rhetoric and composition's status a field that could explore rhetorical dimensions of scientific writing and expertise.

2.2.2 Expertise as a Function of Text Production

Early in the discipline's development, rhetoric and composition scholars began examining scientific discourse and theorizing about the expert status of those who create it. Charles Bazerman's 1988 book *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science* traced the development of a specific strand of scientific discourse from Enlightenment Great Britain to the late twentieth century, when this genre became widely used in the social sciences. Bazerman limited his purview to articles that report on direct, new experimentation, and his purpose was to examine how this genre both empowers and constrains not only scientific discourse, but scientific practices themselves (1988, p. 62). Building primarily on Carolyn R. Miller's theory of genre as social action, Bazerman adopted the operating assumption that the experiment report, like all public genres, is a response to recurrent rhetorical situations, and that while genres facilitate shared meaning, they also foreclose possibilities for innovation as they become highly regularized (1988, p. 23). In a larger sense, Bazerman demonstrated an acute awareness that his project was among the first of its kind in this discipline and hence may require a well-articulated justification. He mustered a lengthy argument that "writing matters," by which, in context, he meant that the study of the writing produced by a scientific discipline is an effective means of learning about how that discipline makes knowledge (1988, p. 19).

Bazerman's book adhered very closely to its methodological framework of rhetorical genre theory, giving his study strong internal consistency but tightly constraining the degree to which it could consider questions not directly related to genre. Specifically, the notion of expertise was never directly dealt with; Bazerman simply noted early on that he would be analyzing “writing done by mature members” of various scientific disciplines (1988, p. 3). Consequently, there are passages in Bazerman's work where genre was used as a framework to discuss topics perhaps better suited to theories of expertise. For example, toward the end of the book, Bazerman declared:

Most important, the features we may associate with genre are hardly contained in their formal appearances on the page. The formal features are only ways more fundamental relations and interactions are realized in the act of communication. In recognizing and using genre, we are mobilizing multidimensional clusters of our understanding of the situation, our goals, and our activity. (1988, p. 319)

Here, Bazerman posits genre as a path to becoming not only a good writer, but an adept participant in one's discourse community. Although I commend (and hope to emulate) Bazerman's methodological consistency, this passage demonstrates a limitation of making genre the central framework for examining scientific discourse. The preceding quote was taken from a chapter designed to instruct young scientists and their teachers about effective writing practices. Hence, the “we” includes people in early stages of their scientific education. It seems unduly optimistic to promise undergraduates that if they can recognize and use a genre, they can participate in the “more fundamental relations and interactions” of their newly chosen discipline. The ability to understand the historical and rhetorical underpinnings of a genre—though vital—is far from sufficient to produce a work within that genre that a specialized audience will accept. In sum, while genre theory offers substantial benefits as an analytical framework, there is a circularity to its logic that must be overcome anytime genre theory is put

in conversation with theories of expertise. I grant Bazerman's central premise that the experimental article is a genre used by many experts, and so many things about the way experts write can be learned by exploring this genre. But since this formulation presumptively ascribes expertise to the authors whose writing is being examined, expertise itself never comes into view as a construct that can be explored, enriched, or problematized.

In the years that followed the publication of Bazerman's book, rhetoric and composition scholars recognized the need to define expertise more clearly and to more thoroughly map its relation to writing practices. Cheryl Geisler's 1994 book *Academic Literacy and the Nature of Expertise: Reading, Writing, and Knowing in Academic Philosophy* endeavored to define expertise in ways that would help rhetoric and composition scholars bridge what she called the “great divide” between the view of writing held by professional academicians and that held by undergraduates. Geisler defined expertise as consisting of two dimensions—content knowledge and rhetorical knowledge. With this distinction built into her methodology, Geisler examined writing practices in various academic disciplines and concludes that students typically build content knowledge faster and earlier in their education than they build rhetorical knowledge. She contended that while students quickly build content knowledge throughout their undergraduate career, they typically do not become aware of the rhetorical habits of their field (habits she credits Bazerman for highlighting) until very late in their undergraduate career or early in graduate school (1993, pp. 84–7). According to Geisler, a key marker that a scholar possesses both facets of expertise is the frequency with which she or he engages in metadiscourse, which she defined somewhat ecumenically as “discourse which calls attention to either the relationship between the author and the claims in the text or to the relationship between the author and the text's readers” (1993, p. 11)). Geisler pointed to an array of rhetorical analyses of scientific texts done by scholars including Bazerman and Bruno Latour

which suggested the prominence of metadiscourse. These studies further suggested that there is a higher incidence of metadiscourse in documents which scientists write for fellow scientists as compared to that written for lay audiences, and a yet higher incidence in documents which seek to create new knowledge than in those intended to disseminate existing knowledge (1993, pp. 12–13). These findings held particular significance for Geisler's overall project, because she blamed the lack of metadiscourse in undergraduate textbooks as a factor which perpetuates the expert/non-expert divide within the academy (1993, p. 90).

Geisler's project makes two major contributions to my own. First, like Geisler, I adopt the operating assumption that expertise becomes a meaningful (and manageable) concept only when considered dialogically. Only when a scholar has identified what distinguishes an expert from a non-expert in a given situation can she or he examine the rhetorical dimensions of expert discourse. Second, Geisler's identification of metadiscourse as a key feature of expert discourse underscores the appropriateness of Toulminian warrants as a theoretical framework for my project. As noted above, Geisler found that discourse which creates new knowledge tends to include particularly high incidences of metadiscourse. This is a significant discovery in itself, but Toulmin's theory of warrant provides a basis for distinguishing between knowledge-creating discourse which utilizes existing means of knowledge production (warrant-using arguments) and knowledge-creating discourse which asserts the discovery of a new means of knowledge production (warrant-establishing arguments). This distinction is key to my project because although warrant-establishing arguments often represent a discipline's cutting edge, such arguments are particularly hard to deploy in the courtroom due to IRE 703's insistence that expert testimony be based on widely accepted methods. Furthermore, warrant-establishing and warrant-using arguments each entail different rhetorical challenges an expert witness must address to make his or her testimony appear coherent and convincing. Warrant-using

arguments, the kind most likely to be employed in jury trials, require the expert witness to contend that the methods used to produce the scientific evidence being presented are accepted by her or his discipline. Unless opposing counsel contests the method's discipline-wide acceptance, the main challenge an expert witness faces in employing a warrant-using argument is to make its technical points comprehensible to the jury. Warrant-establishing arguments, however, include the additional challenge of requiring the expert to argue that a new method *deserves* discipline-wide acceptance. As I pointed out in the previous chapter, such arguments usually only appear deep within discipline-specific literature.

Both types of arguments may appear in jury trials, but their presentation in court will differ greatly from its articulation in scientific literature. It would be neither permissible nor practical for a scientist, while addressing the jury to simply read or recite passages from journal articles. Consequently, it is necessary to develop a rhetorically-oriented theory of expertise that is not tethered to the production of discipline-specific literature. I contend that rhetoricians should consider the expert herself the locus of expertise, not her texts. Her white laboratory coat is a more powerful and more portable symbol of her expertise in the myriad situations where her texts cannot be invoked due to time constraints, levels of audience comprehension, or, as in the case of jury trials, due to a web of rules effectively banning such texts. These situations, where experts are communicating in public with someone other than their peers, almost always take the form of an interview. Journalists, legislators, and of course, trial lawyers, all use a series of carefully crafted questions to prompt scientific experts to display their expertise to a variety of publics. While Bazerman and Geisler have mapped a text/expert relationship which many in our field have continued to fruitfully explore, we need a theory of expertise suited for situations in which the only kind of expertise that matters is the kind that can manifest itself as confident-sounding answers to straightforward-sounding questions.

Here, too, Toulmin's theory of the warrant provides a starting point. In fact, I contend that his theory of the warrant implies a theory of expertise that is useful in any communicative situation involving experts and publics. In chapter one of *The Uses of Argument*, Toulmin introduced the concept of a “field of argument” which he said is nearly but not exactly synonymous with an academic discipline (Toulmin, 1958), p. 14). It is nearly synonymous in that it consists of all the people who understand what counts as proof in a certain kind of argument; in elaborating on what he meant, he listed specific academic fields like geometry as examples. While this is likely to consist of people with formal training and official credentials in these fields, anyone who understands what counts as a data and how it can be used to reach conclusions in the argument at hand has entry into that field of argument. This clearly foreshadowed what Toulmin would say later in the book when he presented his theory of the warrant, and it suggests that warrants are useful for analyzing arguments either within or beyond the academy. Geisler situated the expert/non-expert divide between academicians and students and framed the divide as a matter of literacy. Although I agree that literacy is a useful category for delineating expertise, I contend rather than focusing on genre production, rhetorical analysts should focus on information literacy—specifically, they should seek to discern which of the interlocutors in a given argument demonstrate facility with the relevant warrants.

Such a view of expertise can be put in to conversation meaningfully with issues raised by Warner's view of publics and by Miller's discussion of rhetoric's alterable visibility. Toulmin's concept of a field of argument, being bound together by a shared understanding of a set of warrants, aligns very closely with Warner's practice of defining a public around its shared discursive practices. In other words, Warner and Toulmin offered important insights about how communities of experts are formed and sustained and about the difficulties experts face when communicating outside these communities. In those situations, experts must decide how much

of their reasoning to make visible, how to make it visible. As mentioned in the previous chapter, warrants become embedded into a field's methodology. Therefore, when an expert addresses a public, she must put on display precisely those features of her reasoning which her disciplinary practices have rendered invisible to herself and her colleagues.

2.2.3. Rhetoric and Composition Scholarship on Law

The sub-discipline of rhetoric and composition that has produced the largest body of scholarship about the legal field is professional communication. This body of scholarship exhibits three major areas of exploration: Studies of legal writing practices, the legal implications of technical writing, and the rhetorical dimensions of courtroom testimony.

Scholarship about legal writing practices gained momentum in the late 1980's. The 1989 edited collection of essays *Worlds of Writing* featured a section on legal writing (Matalene, 1989). One of them, by John Warnock, is a thought piece arguing that English professors can make valuable contributions to the teaching of legal writing if they are willing to operate within a field that views writing as more utilitarian than intrinsically valuable (Warnock, 1989, pp. 383-4). Warnock staked this claim primarily on law's affinity with poetry rather than its affinity with rhetoric or its purview under technical writing, a clear sign of how young rhetoric and composition was at that time in its institutional status and level of specialization (1989, pp. 384-5). One facet of his argument, however, remains current even a quarter century later. Warnock argued that law school requires copious production of highly specialized forms of writing while offering very little direct writing instruction (Warnock, 1989). This same assertion has continued to motivate rhetoric and composition scholars to make forays into legal writing. Indeed, Warnock reiterated this motivation at the beginning of his 2003 book *Effective Writing: A Handbook with Stories for Lawyers* (Warnock & Warnock, 2003). As works like

Warnock's have increased in number and sophistication over the last few decades, they have tended to make increasing use of rhetorical genre theory. As early as 1989, compositionist Teresa Godwin Phelps offered one of the earliest overviews of the types of documents lawyers write along with genre-specific instructions for how these can be produced effectively (Godwin Phelps, 1989). Other researchers working in this vein include Karl Uhrig (Uhrig, 2012)Katie Guest Pryal, and Alexa Z. Chew (Pryal, 2013), (Chew & Pryal, 2014). These recent genre-theory bases studies emphasized connections between writing conventions and workplace culture, thus solidifying the place of professional writing (and not merely rhetoric and composition in general) as a an apt disciplinary approach to studying legal writing.

Another major trend within professional writing scholarship about the legal field is attention to issues of authorship and agency. John Logie has produced a number of works analyzing the tangled implications copyright law poses to collaborative workplace writing and the inability of copyright law to keep up with the exigencies posed by technological advances (Logie, 2005a(Logie, 2005b). Mark Hannah has argued that the connection between technical writing and law is so intricate that technical writers effectively co-produce the law alongside the legal system. This connection is particularly relevant to questions of liability, Hannah argued, because the manner in which safety warnings and instructions are written shapes the way a law suit will likely unfold (Hannah, 2010). Beyond this specific connection, Hannah also saw a larger philosophical resonance in modes of thoughts and research in both fields (Hannah, 2010).

A third trend is the analysis of the giving or hearing of testimony in court. This trend, clearly the one most directly related to my project, is also the one with the smallest body of scholarship with technical communication. Jennifer Andrus' article "A Legal Discourse of Transparency: Discursive Agency and Domestic Violence in the Technical Discourse of the Excited Utterance

Exception to Hearsay” argued that the legal field's encoded assumptions about the nature of language constrain the agency of women and minorities who testify in court(Andrus, 2010). Like Golan, Andrus examined the historical conditions that resulted in the privileging one type of testimony over another, and like Golan, Andrus traced the current state of affairs to the British Enlightenment (Andrus, 2010). Andrus argued that the basis on which today's legal system excludes hearsay carries with it two concomitant vestiges of the Enlightenment: an epistemic stance hostile to subjectivity and a reduction of language to a vehicle whose sole purpose is to clearly convey observed experience. Consequently, even today, “Testimony based on prior testimony [i.e., hearsay] is weaker than testimony based on empirical knowledge. Hearsay obscures 'the original truth' because it is further removed from the empirical world and too reliant on language and the speaker” (Andrus, 2010). Andrus' work has two clear implications for my own. First, her work makes clear that eyewitness testimony occupies a privileged position over hearsay on the same basis that expert testimony occupies a privileged position over lay testimony—its purported proximity to observed experience. Second, I aim to emulate Andrus' attention to social impacts resulting from this hierarchy of privileged discourse. Andrus noted that exceptions within the law that permit hearsay under special circumstances can actually rob some witnesses of agency they would otherwise possess. When women or minorities have hearsay testimony admitted under this exception, judges have vast latitude to rule as to the intent and trustworthiness of such utterances, and they sometimes do so according to patriarchal views of human relations (Andrus, 2010). A noteworthy corollary exists between this type of patriarchal prerogative and the type that underlies the automatic privileging of expert testimony over direct eyewitness testimony. Furthermore, I see my project, as Andrus saw hers, as participating in a view of technical communication as “the

process of translating what an expert audience knows for an audience with a need to know” (Andrus, 2010), p. 77, as cited in (Connatser, 2007), p. 134, as derived from (Barnum & Carliner, 1993).

Certainly, a jury qualifies as an audience with a need to know what the experts know. Noting this, technical communicators have theorized about jurors as learners. In “Beyond Plain Language: A Learner-Centered Approach to Pattern Jury Instructions,” Katherine S. Miles and Jacqueline L. Cottle applied this framework in order to explain the difficulties jurors face as they interpret and apply judges' instructions ((Miles & Cottle, 2010). Miles and Cottle acknowledged that, although federal and state government agencies have been increased efforts to their public communications more comprehensible, jury trials remain retain linguistic practices that are beyond the reach of most laypeople. Commenting on a series of studies done on jurors' comprehension of judges' pre-trial instructions, Miles and Cottle reported:

This research indicates that the legal system is, in the best of circumstances, failing to inform jurors of the rules with which they are to make their decisions and confusing them in the worst circumstances. It is our belief that the instruction of nonexperts involves more than clear, concise language. We argue that the field of technical communication is in a unique position to improve jurors' conceptual understanding of the legal system by reconceptualizing the jurors' task as a learning process in addition to a deliberative one. By viewing jurors as learners, we are in a better position to investigate those factors that may contribute to jurors' misunderstanding of instructions. We argue that a learner-centered approach to instructions may improve jurors' comprehension of their task. (Miles & Cottle, 2010)

Specifically, Miles and Cottle argued that methods used to gauge and increase workplace competencies can be used to gauge and increase jurors' ability to learn the legal jargon and

specialized reasoning processes needed to render a verdict (Miles & Cottle, 2010, pp. 101–2). These models of workplace learning are under-girded by a theory of how experts and non-experts can communicate effectively (2010, p. 102). Their framework listed difficulties in comprehending the technical components of a job as the first barrier which must be overcome in the expert/novice gap (2010, p. 102). In its interest in how this barrier is overcome, my project is closely related to Miles and Cottle's. Like pre-trial instructions, scientific testimony is replete with technical components which must be comprehended for effective decision making. My project is the first in this discipline to consider how expert witnesses seek to help juries overcome this barrier by examining the way they discuss their methodology.

2.3 METHODOLOGY

2.3.1 The Need for a Specialized Qualitative Coding System

As the previous sections of this chapter have aimed to demonstrate, I am joining a rich tradition of rhetoric and composition scholars examining discursive practices in science and law. My project's main innovation on this tradition is that I am not analyzing scientific methodology *per se*, but as a discursive feature of a very specialized kind of argument made under the tightly constrained conditions of a jury trial. I am therefore in need of a rhetorically-oriented methodology well suited to analyzing arguments about scientific methodology.

Toulmin's theory of the warrant both provide exactly that; they consequently form the foundation of this project's methodological framework. However, both Toulmin and Green built their frameworks to analyze arguments occurring in academic contexts; both assumed all interlocutors possess the temporal, financial, and educational resources needed to compose or analyze voluminous, complex arguments. These assumptions cannot be applied directly to jury trials, where, as Miles and Cotter have demonstrated, jurors are rarely prepared to understand

even the legal technicalities of the trials they hear (2010). Moreover, expert witnesses are tightly constrained as to the extent to which they can explain their science. As the previous chapter explained, in the courtroom, scientists are effectively cut off from the accouterments of their research and the literature of their discipline. And, they must often contend with contentiousness and chicanery from the opposing lawyer. The discourse produced under these constraints can be characterized as dialogic, both in the formal sense of “the use in a text of different tones or viewpoints, whose interaction or contradiction is important to the text's interpretation” (Stevenson & Lindberg, 2010) and in the more general sense of being structured as dialogue. This poses a conundrum to technical communicators. On the one hand, expert testimony is by definition a performance of discipline-specific ways of knowing, and thus seems as ripe for Toulminian analysis as any of the materials examined by Bazerman, Geisler, and many others. But because expert testimony differs greatly in form, structure, and purpose from academic discourse or popular science writing, previous methodologies cannot be applied in the same way. My project therefore needs a methodology well suited to identifying these esoteric, epistemic structures as manifested in the thrust and parry of direct and cross examination.

2.3.2 A Coding Scheme to Identify Expertise as Language-Level Features of Dialogic Discourse

This project draws on previous applications of Toulminian analysis to scientific discourse, especially Whithaus' (2012) application of a Toulminian coding scheme to environmental science writing. Like many technical communication researchers, Whithaus found Stephen Toulmin's model of argument (1958) useful in identifying the ways a discipline employs rhetoric in the creation of new knowledge. But in order for Toulmin's model to be rigorously applied to contemporary science writing, Whithaus argued, it must be modified to account for

the fact that in most scientific genres, arguments are presented through “cross-modal relationships” in which a claim presented in textual form may be evidenced through data visualization or vice versa (2012, p. 113). Whithaus thus developed a framework that combines the Toulmin model with previously developed frameworks for analyzing visual elements of scientific writing (2012, p. 116). My approach shares Whithaus' supposition that the Toulmin model is both precise and malleable. But whereas Whithaus augmented the Toulmin model for application to today's increasingly complex, multi-modal forms of scientific communication, I endeavor to adapt it to account for the performative, agonistic, and dialogic nature of expert testimony.

Coding began by applying the Toulminian categories to the passages of expert testimony. Like Whithaus (2012), I adopted the view that elements of the Toulmin system can occur in close textual proximity, an approach resulting in different phrases or clauses within the same sentence receiving different codes (p. 112). This study also followed Whithaus' study in excluding elements of the Toulminian system that initial coding indicated to be inapplicable; all included elements are listed in Table 1. Whithaus engaged in double coding while applying the Toulmin model, explaining that on a occasion a sentence functioning as a claim for one section of a scientific report also “functioned as backing for broader claims being made in the report’s results and discussion section” (2012, p. 112). Very little double coding was done in my application of the Toulmin model, but there were instances in which a witness made the same statement at different points in her testimony, and I judged that each iteration merited a different code. And whereas Whithaus could rely on the scientific reports he examined to furnish grammatically complete sentences to use as base units (2012, p. 112), this study had to account for the dialogic and sometimes scattered nature of courtroom testimony. I sometimes regarded a lawyer's question and the witnesses' answer as a base unit. Generally, this

adjustment occurred when both the question and answer were each comprised of one sentence or of sentence fragments.

Next, Mackiewicz's framework was applied to the same passages. Her framework was developed to analyze the rhetorical moves made by consumers as they attempt to persuade fellow consumers to purchase consumer electronics (2010). Mackiewicz built on previous research about consumer confidence in technologies they are considering purchasing to show that they much more likely to buy a product if it is recommended by credible source (2010, p. 7). After analyzing over 750 product reviews of various consumer electronics, Mackiewicz identified specific tactics reviewers use to assert their authority; she then grouped these ten tactics into three broader categories (2010, pp. 10–11). Initial coding showed only the first and third categories to apply to the portions of expert testimony used in this study. Mackiewicz developed her framework to analyze brief product reviews, comments, and questions. These texts are, like expert testimony, essentially dialogic. Beyond the obvious similarity that both testimony and product reviews often occur in a question/answer format, consumer reviews, like testimony, represent the intersection of multiple viewpoints. Mackiewicz designed her instrument to assess utterances as short as twenty or thirty words long (2010, pp. 12–3) which makes it well suited to the thrust-and-parry of courtroom testimony. Mackiewicz did not present her model as an exhaustive list of expertise assertion types, so any that did not clearly fit within the framework were noted but left uncoded. Many passages were double coded; some were triple coded.

Mackiewicz's expertise assertion categories correspond closely the type of expertise assertions scientists make from the witness stand. Because Indiana Rules of Evidence 702 mandates that expert witnesses have relevant “knowledge, skill, experience, training, or education,” (IRE, 2014) lawyers often begin direct examination by prompting their expert witnesses to describe

their professional qualifications. The responses often align closely with the five rhetorical tactics Mackiewicz lists under the category “assertions of a relevant role.” (See Table 1.)

TABLE 1

Coding System Combining the Toulmin model (1958) with Mackiewicz's Framework for
Online Assertions of Expertise (2010)

| Toulmin's Model of Argumentation | | Mackiewicz's Framework for Assertions of Expertise | |
|----------------------------------|---|--|--|
| Element | Function | Assertion Categories | Assertion Types |
| Claim | Draws a conclusion using all other elements of the argument | Assertions of Product-specific experience | Regular experience with (using) the product (i.e., using the product over |
| Data/Grounds | Facts, statistics, or other information used to support a claim | | Testing the product (i.e., using it to see what it can do, how well it performs |
| Warrant | Authorizes the movement from data to a claim | Assertions of a relevant role | Received or receiving formal training relevant to the product |
| Backing | Supports the warrant on the epistemic level | | Relevant experience from a hobby (i.e., nonprofessional experience) |
| Rebuttal | Counters a previously stated claim | | Employment in profession relevant to the product Association with someone who experience relevant to the product Conducted research on product (e.g., online research) |

After the witness has introduced herself by way of her credentials, she then typically endeavors to win the jury's trust not just in her but in the specific technology which underlies her testimony. In doing so, she will often describe her own facility with the technologies in ways that align very closely with Mackiewicz's categories of "product-specific experience." Essentially, the experts' task is to transfer their trust in their techniques and equipment to the jury. In Toulmin's parlance, they must explain and justify their warrants. Combined, the two frameworks can illuminate how scientists perform the ship-in-a-bottle feat of articulating warrants in the courtroom.

This combined framework can also illuminate the difficulties expert witnesses face while testifying and the concomitant difficulties jurors face while weighing that testimony. As the next section describes, I will interview jurors, lawyers, and expert witnesses. The results will be transcribed and then analyzed using the same coding scheme that was applied to the trial transcripts. These research interviews are, like cross and direct examination, dialogic. Furthermore, the questions themselves (see section 2.4.2) ask participants about the same issues emphasized in my analysis of court transcripts.

2.4 THE DESIGN OF THIS STUDY

This study was conducted in two stages. In Stage 1, I examined and coded passages of expert testimony from the transcripts of four homicide cases that originated in Indiana superior courts and which were subsequently appealed to either the Indiana Court of Appeals or Indiana Supreme court. I limited my purview to cases within the last five years.

There were both theoretical and practical reasons for these parameters. From the theoretical standpoint, the types of trials I have chosen as my research purview are a good fit for this type of exploration because criminal cases often feature dueling expert witnesses. If one side calls an expert witness, then the other side will almost always call an expert witness in the same field to counter-act the first expert's testimony. This increases the probability that methodology will become an overt feature of the contention between the dueling experts. Second, criminal cases are lengthy, and this allows me to observe how expert testimony might change over the course of a single case. Criminal cases, especially ones involving serious charges, are almost always given priority on a court's docket. However, they are such complex affairs that months or even years can pass between the filing of charges and the reaching of a verdict. The court records I accessed through the state's database include not only transcripts of the trial, but also records of

depositions and other documents that preceded the trial. Thus it became possible to see if differences exist between the depth in which expert witnesses explain their methodology prior to the trial compared to explanations within the trial itself. It was also possible to see if and how expert witnesses adjust their basic rhetorical strategies as the case unfolds.

From the practical standpoint, studying this type of cases was advantageous due to the abundant availability of documents afforded by the category of cases delineated above. In the U.S., all criminal trial proceedings (except minor traffic infractions) are recorded in their entirety by a court stenographer or court reporter. However, these records are usually maintained in stenographic shorthand until and unless the case is appealed. When a case is appealed, the higher court hearing the appeal will request a complete record of all documents used in the original trial. These documents are then transcribed into full-text for the higher court's use. Therefore, any appealed case has its entire proceedings preserved in accessible form, including exhibits entered into evidence and deposition transcripts.

In Indiana, one governmental office is responsible for maintaining all these records—The Records Division of the Office of the Clerk of the Appellate Courts. They allow free, unlimited viewing of these records at their office in downtown Indianapolis. They also offer copies of the transcripts for purchase in part or whole. This immense database is easily searchable through the “Appellate Case Search” function on the office's website (<https://courtapps.in.gov/docket>).

I have limited my scope to cases within Indiana because then the all cases would have the following characteristics in common:

- They all can be accessed through means described above.
- They all abide the same rules of evidence, which define and guide the use of expert testimony.

- They all occurred within a relatively small geographic region. Additional research on any particular case thus becomes feasible.

Working within these parameters still yields a vast number of cases for potential study; there are more than 500 murder cases alone within these search criteria.

The research in Stage 1 was designed to identify major patterns about the actual practices and patterns of expert testimony. The patterns were then grouped into four major challenges expert witnesses face; each challenge is discussed individually in Chapter 3. Stage 2 explores the origins of these challenges by examining the means through which scientists are trained to be expert witnesses and the means through which lawyers are trained to elicit expert testimony. Accordingly, Stage 2 examines scientific journal articles, legislative documents, law school textbooks, law journal articles, and the results of an IRB approved interview with an expert witness. The results of Stage 2 are discussed in Chapter 4.

2.4.1 Hypotheses

I hypothesize that in direct examinations, expert witnesses will typically elide the discipline-specific nature of their scientific conclusions. Although expert witnesses are likely to express a degree of certainty in conjunction with the claims they make during direct examination, they will likely posit this certainty as something with which any scientist from any discipline would concur. I further anticipate that references to discipline-specific ways of knowing in direct examination will be limited to assertions that the expert is using methods of inquiry which have widespread acceptance in the field. In cross examination, I anticipate that warrants may come into sharper focus as lawyers seek ways to qualify, limit, and lower the certainty a witness projects during direct examination. I expect that defense lawyers will capitalize on the fact that

a scientific method must be comprehended before it can be trusted. I therefore anticipate cross examination questions prompt the expert witness to inadvertently overload his or her answer with jargon. I also expect that during cross-examination, lawyers will attempt to lower the jury's confidence in a scientific method by calling attention to the differing standards of certainty that govern a scientific discipline versus those that govern the law. In other words, I expect cross examination to pit Toulminian warrants against the legal notions of reasonable doubt, or proof beyond the shadow of a doubt.

CHAPTER 3: ANALYSIS OF EXPERT TESTIMONY

3.1 INTRODUCTION

This chapter presents data and analysis from Stage 1 of this study, which consisted of the qualitative coding of portions of four court transcripts. The decision to focus on these four cases and the specific passages within them arose from the results of preliminary coding of portions of about twenty court cases. Preliminary coding suggested the following four challenges expert witnesses face while explaining their methodology to the jury:

1. The expert witness is reduced to an eyewitness of her own methodology.
2. The expert witness is accused of lacking the education necessary to validate her methodology.
3. The expert witness must contend with public perceptions of her discipline's purview.
4. The expert witness must explain how new methodologies gain discipline-wide acceptance.

Preliminary coding came to a conclusion when multiple instances of each challenge began to emerge and when new challenges ceased to appear. Although most cases exhibited several of these challenges, usually one of them occurred more frequently than the rest. This result became the selection criteria for secondary coding. Here, four cases were chosen—one to represent each challenge—and the entirety of an expert's testimony was coded using the scheme described in the previous chapter. This chapter presents the results of this coding process. Due to the sample size, I make no claim about the generalizable nature of these

challenges. I do, however, discuss the significant role each challenge played in the outcome of its respective trial.

To understand these challenges in their legal context, it is necessary to view them in light of the specific wording of the laws the defendants are accused of violating. Indiana's criminal code defines a murderer as "Murder Sec. 1. A person who: (1) knowingly or intentionally kills another human being" (Fishburn, 2015, pp. 134–5) The definition, though succinct and perhaps tautological to laymen, signals three separate elements a prosecutor must establish beyond reasonable doubt in order to sustain a murder charge. The first is the identity of the killer, and two of the cases I examine in this chapter feature DNA experts who are called on to establish the killer's identity. The second element is that the killer harbored intent to kill, and that this intent falls outside any legally justifiable lethal intent, such as self defense. Psychologists and psychiatrists are frequently called on by defense attorneys to cast doubt on whether a defendant was capable of distinguishing between types of intent, but none of the cases here involve this argument. Finally, the prosecutor must show that the defendant performed (or was responsible for) the act that resulted in the victim's death.⁴ In two of the cases I analyze, the defendants do not deny harming the victims, but instead deny that their harmful actions were the cause of death. In both of these cases, the prosecution produces expert witnesses to testify that defendant's actions were the cause of death. In one of these cases, expert testimony about the defendant's actions are also used to establish lethal intent.

4 The connection between forensic rhetoric and stasis theory is as tight now as it was in Cicero's day, when he summed up court hearings as debates about "what was done..what was its character, [and] how should it be called" (2001, p. 153).

3.2 *CARPENTER V. INDIANA*:⁵ THE EXPERT IS REDUCED TO AN EYEWITNESS OF HER OWN METHODOLOGY

The facts of this case and the role expert testimony played in establishing the identity of the killer are described at length section 1.1. Here, I revisit a passage toward the beginning of Fishburn's testimony and analyze it according to the methods described in the previous chapter. Applying a Toulminian coding system to Fishburn's testimony showed that its elements are arranged in the following sequence: backing, warrant, data, and claim. After being sworn in and asked about her professional credentials, Fishburn was asked to explain what DNA is. Her answer, nearly 800 words long, was coded almost entirely as backing. The following passage, taken from the middle of her response, is typical of the discourse she provided as backing:

The specific type of DNA that we look at, it's called nuclear DNA. It's found in all cells that have a nucleus so this would be white blood cells in your blood, your skin cells, the root of your hair, sperm cells, tissue cells, any of these would have a nucleus and have the type of DNA that we look at. The DNA is packaged into chromosomes. There's 23 pairs of chromosomes, we receive one set from mom and one set from dad so we actually have 46 total chromosomes. Now the type of DNA testing that we actually do is called short tandem repeat and that's, what that is there's a location in your DNA that gets repeated over and over and the number of times that repeat occurs will vary from one person to another. (2014, pp. 299–300)

This entire passage, like the portion of her response leading up to it, was coded as backing because later in Fishburn's response, this discussion of the nature of nuclear DNA will support her warrant that the repeated DNA patterns she referenced are a sound way to identify an individual human source (2014, p. 302) Later, that warrant will support the specific data

5 The cases whose transcripts I analyze are all referred to by their appellate case names rather than their original trial case names. Although the transcripts record the original cases' trial proceedings, the transcripts were created expressly for the use of the appellate courts. As such, they are often paginated continuously along with auxiliary materials added by the appellate court clerks.

Fishburn will be asked to present when the prosecutor asks whether she tested items taken from the crime scene for DNA from any of the people associated with the case (2014, p. 304).

Finally, that data is used to support the claim that Steenbergen's DNA was completely absent from the crime scene, but Hernandez' was found on multiple items (2014, p. 314). In the immediate context of Fishburn's testimony, the STR results function as claims, but in the larger context of the trial, they function jointly as a rebuttal to the defense's claim that Steenbergen is the killer.

These Toulminian elements occur in exactly the reverse order as that anticipated in the model itself. Wanting to describe arguments as they happen in both scholarly and popular practices, Toulmin built his model around an implied analogy to architecture. Toulmin noted that typically, arguments begin with a claim; that claim is supported by grounds; grounds are supported by warrants, and warrants by backing (1958, pp. 99–105). In Western culture, arguments are often presented in approximately this order, a tradition traceable as far back as Aristotle's advice on arrangement (2006, pp. 230–5) and which has typified the structure of scientific discourse since at least the middle of the twentieth century (Bazerman, 1988, p. 28). Although I wish to avoid making broad claims about the merits or limitations of this traditional argument structure, I offer the following two conjectures. First, this traditional structure is the one jurors in the U.S. are likely to have encountered most frequently. Second, only if a jury is appraised from the onset of an argument's main claims can they be expected to listen once to an oral argument and assess whether the argument's constituent elements ultimately support those claims. In the Carpenter case, however, the jury had to keep pace with a scientifically complex argument as it unfolded in reverse Toulminian order. One possible explanation is that the elements were arranged to recapitulate the sequence of events used to maintain the integrity of the evidence's chain of custody. The prosecution may have asked Fishburn to discuss test

results last because, chronologically, testing was the final step permitted by the strict procedures governing evidence admissibility. If so, the prosecution structured Fishburn's testimony not to maximize its comprehensibility to the jury, but to display its admissibility to the judge and defense counsel.

The jury was likely further confused by conflicting messages about the basis of Fishburn's expertise. These conflicting messages can be seen through the concurrent application the Toulmin model and Mackiewicz's framework. Fishburn's testimony opened with the following exchange between her and the prosecutor, Ms. Sharpe:

Sharpe: Tell the jury your education and your background and your experience that allows you to work in the field of DNA analysis.

Fishburn: A: I have a bachelor's of science degree in genetic biology and I have a master's degree in forensic serology and DNA. I have worked for ten years, almost ten years at the Indianapolis Marion County Crime Lab and I have undergone my in-house training to become a qualified DNA analyst and I receive annual training and semiannual proficiency testing to ensure I'm a qualified analyst. (2014, p. 298)

This passage was triple coded with the following categories: regular experience using the product, formal training, and employment in a relevant profession. The last phrase of Fishburn's response (underlined) was also coded as warrants, since, taken in conjunction with the prosecutor's question, the phrase articulates a basis for making certain kinds of claims from certain kinds of data. The implied theory expertise propounded here is one that posits the scientist herself as the locus of expertise. This implication is further enforced by the emphasis in the prosecutor's subsequent questions about whether Fishburn personally conducted the DNA tests whose results were being presented (2014, pp. 303–5). Elsewhere in Fishburn's testimony, she was prompted to explicitly address warrants, and here, a significant shift

occurred in the implied basis of her expertise. Asked if the rest results were trustworthy, Fishburn couched her response in terms of discipline-wide practices for interpreting test results, safeguarding against contamination of samples, and repeating experiments for the sake of corroboration (2014, pp. 302–3). These discipline-oriented passages corresponded only to the assertion type of having conducted research on or using the product itself; they contained no reference to Fishburn's own qualifications and consistently downplayed her personal role in the testing. That an extended discussion of warrants should correspond to descriptions of an expert's association with one's colleagues is not surprising, but it is significant. It underscores divergent lines of argumentation expert witnesses are required to make and the consequent difficulties juror-as-learners likely experience. Jurors are left to grapple with whether they should lend credence to expert testimony because it comes from the scientist who conducted the evidence-producing experiments or because the testimony is based on methods any scientist in the same field would accept and employ with presumably similar results.

3.3 *VILLEGAS V. INDIANA*: THE EXPERT WITNESS IS ACCUSED OF LACKING THE EDUCATION NECESSARY TO VALIDATE HER METHODOLOGY

On October 24, 2012, police in Newton County responded to a 911 call claiming that a thirteen-month-old male named C.A.⁶ had been killed (2014, p. 6). Francisco Villegas, Jr., the man who had sole custody over C.A. that night, was immediately considered the sole suspect. He also immediately began offering a tangled web of explanations as to C.A.'s death, which Indiana Court of Appeals Judge John G. Baker tactfully referred to as “varying” (2014, p. 21). Baker's memorandum explaining the court's decision recounts that when police and EMT's arrived at Villegas's home,

⁶ Although some publicly available documents related to the case include the victims name, others use only his initials, presumably due to his status as a minor. Out of an abundance of caution, I will adopt the approach used in the more reticent documents.

At first, he claimed merely that C.A. had drown in the bathtub. Then, he stated that C.A. had fallen in the bathtub. Then, he stated that C.A. had fallen in the bathtub, then fallen down the stairs, then struck his head during a game of helicopter, then fallen in Villegas's arms. (2014, p. 21)

When the case went to trial, Villegas' attorney Charles Dargo failed in his attempt to exclude these statements from the trial. Consequently, Dargo crafted a defense that hinged on the assertion that C.A.'s death was accidental. A battle ensued between expert witnesses representing both sides, and its rhetorical focal point became attributing causes to the bruises which covered a significant portion of C.A.'s body. The defense planned to produce expert witnesses arguing that the bruising could have been the result of accidental causes; the prosecution called experts alleging the bruises resulted from forceful blows with fists and the bottom of a beer bottle.

The first expert witness called by the prosecution was registered nurse Melissa Hamstra, who was working in the emergency room to which C.A. was brought on the night in question. Hamstra's dual status as an eyewitness of events surrounding C.A.'s presence in the emergency and as expert witness clearly effects the sequence of questions in prosecutor Jeff Drinski's direct examination. After first asking Hamstra to summarize her training and professional experience, Drinski choreographed his direct examination so that Hamstra's answers formed a cohesive narrative of her experiences that night, although the narrative is interspersed with extended descriptions of certain medical technologies and procedures. The predominantly narrative structure of Hamstra's testimony posed a difficulty for Toulminian coding, which is designed for polemic prose. In this particular case, the difficulty was exacerbated by terseness of the questions and answers, which necessitated frequent switching between defining the base unit as sentences or as question/answer pairs. At the risk of offering an untheorized assertion, I

would summarize Hamstra's narrative as emphasizing that all E.R staff performed their duties properly, and that all signs indicated C.A. died before arriving (2014, pp. 97–9).

Nonetheless, Toulminian coding clearly applied to portions of the text in which Hamstra was being asked to act in the capacity of an expert rather than an eyewitness. The prosecution showed the jury a series of five photographs of C.A.'s bruises. Drinski then singled out one photograph and initiated the following exchange:

Drinski: Do you see anything specific in this photograph that caught your attention that evening?

Hamstra: Yes, I noticed the bruising around the chest, which looked like it could be a hand, fingerprints.

Dargo: Objection. I object to the extent that she's going to speculate on what may have caused that bruising...I have no doubt she can identify a bruise, but I would ask the Court to let me voir dire her [i.e., ask her a series of questions] in regard to whether she has special training on what may have caused the bruise. (2014, pp. 99–100)

Hamstra's response begins with data (bruising) and moves directly to a causal claim. Dargo's objection, which the judge sustained, fits precisely into the category of warrants; it explicitly references the authorization needed to move from data to a claim.

Needing a new basis on which to continue this line of questioning, Drinski sought an alternate means of establishing Hamstra's expertise. He asked Hamstra, “You've been a trauma nurse for five years?” which Hamstra affirms (2014, p. 100). Drinski then queried Hamstra about the wide variety of severe injuries she had seen in this capacity. This line of questioning culminated with the following exchange:

Drinski: Have you ever seen injuries like [C.A.'s] before?

Hamstra: Never this bad.

Drinski: No further questions.

The Court: [To Dargo] Cross examine.

Dargo: You don't have any idea or any special knowledge as to when these bruises occurred or how they occurred, do you? Any firsthand knowledge when they occurred or how they occurred? (2014, p. 101)

In Toulminian coding, this passage remains focused on warrants, but in Mackiewicz's framework, the passage registers several significant instances of multiple coding or changes in codes. Initially, Drinski sought to establish Hamstra's expert status via her formal training and education. After Dargo successfully objected to this category of expertise as insufficient to answer the question at hand, Drinski shifted the focus to Hamstra's professional experience. In the following cross examination, Dargo ignored the discussion of Hamstra's professional experience and returned to Hamstra's alleged lack of formal training and education. Dargo subsequently pressured Hamstra into agreeing that only a medical doctor has the necessary training to determine the cause of a bruise (2014, pp. 101–2). No one noted the irony that Hamstra was forced to testify under oath about the very category of expertise of which she had just been stripped.

After Dargo finished cross examination, Drinski made one final attempt at providing Hamstra a basis to offer expert testimony about C.A.'s bruises. Having lost the battle over both formal training and professional experience, Drinski deployed the following tactic:

Drinski: You're a mother, aren't you?

Hamstra: Yes, I am.

Drinski: And, if your child looked like that, would you have taken him to the hospital?

Dargo: Objection, Judge. She's not being called here as expert mother, she's being called here in her capacity as nurse in an ER, so I would object to that line of questioning. (2014, p. 102)

Superior Court Judge Daniel J. Molter sustained Dargo's objection, but he also decided that Drinski's question must be entertained. In this interest, Judge Molter stripped Hamstra of all vestiges of expertise and deemed maternity her sole license to speak. Molter asked Hamstra: "The question is as a mother, if your child bore that appearance, would you take him to the hospital?" (2014, p. 103).

Professionalism demands that I treat this passage according to this article's theoretical framework and research interests, but I would feel remiss not to laugh and lament the farce and paternalism here on parade. Hamstra answered the question; to have refused or to have insisted on being the spokesperson of her own expertise would have placed in her in contempt of court. Mackiewicz's framework includes a potentially applicable category for expertise derived from motherhood (non-professional experience), but the framework also assumes the right to construct and articulate one's own expertise.

The paternalism mentioned above resembles that found by Andrus (2010) in the application of hearsay exemptions. In both instances, officers of the court used leeway built into rules of evidence to implement their assumptions about what a witness knows, how she came to know it, and what motivates her to use what she knows. In both cases, the fact of the witness having been a first hand observer of events becomes a means through which the witness lost agency over her own description of those events. An expert witness can be robbed of the privilege of rendering scientific opinions by being relegated to the status of an eyewitness, and her status as an eyewitnesses can be predicated on the invoking of stereotypes.

That paternalism and stereotypes shape perceptions of expert witnesses is made more alarming given Mackiewicz's finding that in a larger sense, assertions of professional expertise count for less as the public gains increasing access to information and technology (2010, pp. 21–2). Not coincidentally, after the jury finished hearing Hamstra's testimony, Judge Molter allowed Dargo to add the following injunction: “Judge, just because of the nature of the case, I would ask the Court to consider cautioning the jury on getting on Google or internet searches about any of the medical portion” (2014, p. 107). *Frye* and *Daubert* were supposed to have standardized the use of expert testimony so that when testifying in this capacity, a scientist need only present her conclusions and describe her methods with reference to the norms of her discipline. These landmark cases were intended to provide a rhetorical link between the laboratory and the courtroom that suited the needs of both venues. When operating properly, this link has the potential to protect expert witnesses from being dragged through the mud by dueling attorneys.

3.4 *DORSETT V. INDIANA*: THE EXPERT MUST CONTEND WITH PUBLIC PERCEPTIONS OF HER DISCIPLINE'S PURVIEW

In her memorandum of decision upholding the lower court's homicide conviction of Randall Dorsett, Indiana Court of Appeals Judge Margaret G. Robb offers a tidy summary of the evidence presented by the prosecution:

On July 17, 2008, Vyon Goodman was found shot to death in an alley in Indianapolis. The vehicle he had last been seen driving was found some distance away, partially burned. A gun, two cellphones, and various other items were recovered from the vehicle. The phones were traced to Dorsett and his girlfriend, and police recovered two unidentified male DNA profiles from one of the phones...Analysis of the sample

indicated Dorsett's DNA matched one of the DNA profiles from the cellphone. (2013, p. 2)

The tidiness of Robb's summary might lead one to believe that in this trial, forensic evidence presented by experts led jurors on a direct path toward deciding Dorsett's guilt. The path was in fact circuitous. The defense staked everything on the argument that the prosecution's physical evidence did not sufficiently establish lethal acts or lethal intent. Goodman had been shot multiple times; ironically, this fact allowed the defense to argue that no clear picture could be reconstructed of the allegedly lethal confrontation between Dorsett and Goodman. Goodman had been found with his hands bound behind his back with duct tape. Here, too, the defense stipulated to this fact but sought to obscure the role it played in the prosecution's theory of how the allegedly lethal acts occurred.

To bolster their theory of these events, the state called the Marion County medical examiner Dr. Joye Carter to the stand. The prosecutor, Mr. Keifner, began his direct examination of Carter with the following exchange:

Q: Dr. Carter, can you tell the jury how are you employed?

A: I'm the chief forensic pathologist to the Marion County Coroner's Office.

Q: And what are your duties with the coroner's office?

A: My duties are to the [sic] direct the services where we examine the deceased person and determine how they died. (2013, pp. 126–7)

In this brief exchange, the prosecutor elicits responses that highlight two of Mackiewicz's categories of expertise assertions. Carter's first response expresses employment in a relevant profession, and her second response expresses regular experience.⁷ Carter's second response simultaneously registers as an expression of Toulminian claims because a determination of

⁷ The exact wording of Mackiewicz's category is "regular experience with the product." Here, I am stretching that to include the tools Carter uses in the course of the duties she describes in this quote.

death must rest on the data gleaned from the examination Carter mentions. These coding results are significant because although Keifner's questions might seem perfunctory, they actually efficiently highlight the role Carter's testimony will play, i.e. cause of death. In the Carpenter and Villegas cases, the prosecutors did not make it clear until a much later point in the expert's testimony how their testimony would help sustain a murder charge.

Keifner also delays asking about Carter's education until after he previewed Carter's relevance to the issue at hand. When Carter is asked about her education, she is allowed to elaborate fully:

A: Yes, I am a forensic pathologist which means I'm a medical doctor who after finishing medical school at Howard University in Washington DC [sic] decided to specialize in the area of pathology which is a main course of study in the second year of medical school—also determining how the body functions and recognizing normal and abnormal. There's a four year period after medical school of studying anatomical pathology where you diagnose diseases by looking at biopsies and body parts and clinical pathology—another two year portion where you diagnose disease by examining body fluids and tissue. Upon completing that four year, I decided to ultra-specialize in forensic pathology which is called medical/legal death investigation. It's non-hospital based where in the community for coroner offices and medical examiners you work to determine how citizens have died. (2013, p. 127)

Two obvious coding results should be mentioned. First, the entire response fits within Mackiewicz's assertion category of relevant formal training. Second, this quote ends in precisely the same way as Carter's previous response; she describes the kinds of claims she makes in her line of work. These results are obvious but important. Keifner's line of questioning has set the stage for Carter to draw connections between the content of her

education and the sort of claims she will be asked to make. Thus, when Carter reiterates that she makes cause of death determinations, this time the jury has a fuller sense of how she goes about doing that and how her training has qualified her to make this type of claim.

Furthermore, the act of reiterating her qualifications may have reinforced their importance to the jury.

The tight connection that Keifner and Carter collaboratively forged between her education and the types of claims she will make becomes paramount once Carter is asked to discuss the victim's gunshot wounds. Keifner walks through a series of questions wherein Carter and the jury are shown a series of autopsy photographs and Carter is asked to identify the nature of the wounds. Having identified them as gunshot wounds, Carter is then asked:

Q: ...I'd like to start with the gunshot wound to the right back that you described and as we get into that can you tell the jury...what an entrance wound and an exit wound are?

A: Certainly. When we examine the body we try to follow the wound pathway where it enters the body, what injuries are developed and where it exits the body if it exits.

Generally we have a round or oval shape to an entrance wound because of the way the bullet travels in air. It rotates on an axis and generally carves out the skin as it enters so we look for what we call an abrasion margin and again usually oval or round but there are exceptions to that. Generally with an exit wound it's small or narrow or slit-like and it doesn't have an abrasion—may have a bruise surrounding it as it pushes tissue forward so we have general characteristics that we look for in a determination [sic] a wound pathway. (2013, pp. 136–7)

In Toulminian terms, this passage includes multiple instances of claims, data, warrants, and backing, and they occur in basically that order. Embedded in Keifner's question are two claims: that a given wound is either a bullet entrance wound or exit wound. Carter's response names the

shape of the wound and the presence of bruising as data she considers in making either of these claims. As backing, she describes the nature of a bullet's rotating flight through the air (which causes entrance wounds to be round and cleanly cut) and its ability to pull skin away from the body as it exits (which causes bruising.) Regarding Mackiewicz's expertise assertion categories, the specific research questions and methods Carter previously mentioned while describing her education and workplace experience align closely with the activities she here describes as the basis of her claims.

Although the prosecution spent considerable time and effort establishing a close alignment between Carter's education and her claims, this strategy proves to be both effective and efficient. In the testimony that follows the preceding passage, Carter answered a series of quick questions about additional autopsy photos of the victim's gunshot wounds. The prosecutor accelerated the pace of the questions because at this point, his questions were designed to draw attention to the features the jury has just been educated to look for, namely, their shape and the presence of bruising (2013, p. 138). In other words, the prosecutor crafted questions that assure the jury that they are now authorized to draw conclusions from the data they are being shown. The jury's participation in the intellectual labor of Carter's testimony may have been key to their decision to convict. They were shown an extensive series of photos of the victim's multiple gunshot wounds, and the jury could now discern for themselves that at least three shots resulted in both entrance and exit wounds. From their conclusions about the nature of the wounds in the photos, the jury likely also drew conclusions about the defendant's intent to cause lethal harm and the specific actions that embodied this intent.

Another advantage to the prosecutor's strategy is that it overcomes popular misconceptions about the purview of the academic disciplines relevant to the testimony. In the strictest sense, Carter's explanation of how an entrance wound and exit wound can be identified is a lesson in

physics, not medicine. In the practical sense, her testimony is best classified as a primer in gunshot ballistics. *The Oxford Dictionary of Law Enforcement* divides all gunshot ballistics analysis into three categories, two of which are clearly identifiable in Carter's testimony (Gooch & Williams, 2007). As a medical doctor testifying about bullet flight paths, was Carter outside her wheelhouse? Why did the defense not accuse her of lacking the necessary education to testify on this point, as the defense did to Hamstra in *Villegas v. Indiana*?

Had the defense employed this strategy, I contend that it would have failed due to the specific approach the prosecution took to establishing Carter's credibility. The prosecution never sought to define the purview of the disciplines Carter mentions while describing her education. The prosecution also avoided questions that leveraged Carter's status as an M.D. as a license to pontificate broadly. Rather, Keifner's introductory questions and Carter's responses hewed closely to the specific claims Carter would go on to make about the bullet wounds. Once these specific claims were voiced, the prosecution asked for warrants and backing only regarding those claims.

To challenge Carter's educational credentials, the defense would have had a Sisyphean task. First, they would have needed to present a comprehensive explanation of the disciplines to which Carter claims membership. Then, the defense would have needed to show that these disciplines do not include the sorts of topics on which Carter has testified. Finally, the defense would have needed to buttress their own credibility to make comprehensive claims about disciplinary purviews. Unless they know as much or more about the relevant scientific disciplines as Carter, why should the jury side with them?

Although the defense in *Dorsett v. Indiana* wisely avoided this approach, scholars in the legal field have noted that it is becoming increasingly popular. Some legal scholars contend that the rise in popularity of television dramas whose story lines rely heavily on the procedures surrounding forensic science presents a new set of challenges to lawyers involved in jury trials. Not surprisingly, one study found that police procedural dramas increase the public's confidence in making their own determinations about forensic evidence, and that this increase of confidence rises disproportionately to public understanding of forensic science (Shelton, Kim, & Barak, 2006). In light of this cultural condition, which Shelton, et al. dubbed "The *CSI* Effect," it may be more important than ever for direct examinations to focus as closely as possible on the science underlying the claim the expert is making.

3.5 *TILLER V. INDIANA*: CUTTING EDGE SCIENCE AS A DOUBLE EDGED SWORD

One September morning in 1999, Indianapolis resident Angela Harris set out to drive her daughter to school. Part of Harris' route took them through an alley, and there she saw an elderly man lying in his driveway "with blood all over his head" (Najam, 2013, pp. 2–3). Harris called 911. Police and paramedics arrived shortly thereafter and the elderly man, Victor Gregg, was transported to a nearby hospital. He died there later that afternoon (Najam, 2013, p. 3).

The homicide investigation quickly centered around the drug trade near Gregg's home. Gregg himself was not suspected of any involvement in the local crack trade, but the neighborhood in which he had lived, near downtown, was near several known crackhouses. The police's focus on the local drug trade led them to Gordon Slaughter, who dealt crack and cocaine in the neighborhood near Gregg's house. Slaughter reported that on the day of the murder, one of his regular customers named Allen White had asked him for drugs despite not having enough

money to pay for them. White asked Slaughter to lend him a gun; Slaughter refused. White and several of his friends left the house where Slaughter operated. They returned hours later with bloodstained clothes and purchased drugs from Slaughter with bloodstained cash (Najam, 2013, pp. 1–3). White was charged with homicide. No one witnessed the attack on Gregg, so the defense sought to cast reasonable doubt on the circumstantial evidence regarding White's identity as the killer. They succeeded. White was acquitted, and the case went cold (Najam, 2013, p. 3).

Over a decade later, Indianapolis cold case detective David Ellison got a lead that reopened the case. Using a newly formed nation-wide DNA database, Ellison learned of a match between DNA found on Gregg's key chain and an entry in the database for a man named Frank Tiller. Tiller had never been charged or even investigated extensively in 1999, but he had been one of White's associates who had left Slaughter and then returned with bloody clothes and cash. As the case went back to trial in 2012, this time with Tiller as defendant, the outcome would again hinge on identifying the killer (Najam, 2013, p. 3).

The expert witnesses called by the prosecution faced the challenge of convincing the jury that genetic science could accomplish in 2012 what it had not been able to do in 1999. However, the intricacy of this case meant that the expert witnesses also faced two of the three previously discussed challenges: the eyewitness/expertwitness distinction and public perceptions of the expert's academic disciplinary purview. My analysis of this case will focus on the challenge of incorporating novel scientific methodologies into testimony, but due to the interrelatedness of the challenges, I will address them all.

In this case, the prosecution called on serologist Tonya Fishburn to aid their case in much the same way they had in *Carpenter v. Indiana*. In both cases, Fishburn had personally conducted much of the genetic testing about which she would testify, creating the possibility that she would be treated as an eyewitness of the tests rather than an interpreter of their results. The prosecutor, Ms. Robinson, worked against this conflation through the structure and sequence of her questions during direct examination. Whereas some prosecutors begin direct examination with a battery of questions intended to preempt all chain of custody related objections from the defense, Robinson organized her questions for Fishburn around each evidentiary exhibit. For example, regarding the key chain, Robinson merely asks Fishburn to affirm that her initials appear on the exhibit. Robinson then immediately moved into questions asking Fishburn to offer backing and warrants about how the DNA was matched to Frank Tiller (2013, pp. 555–7). Furthermore this case featured DNA evidence prepared by two different laboratories. Representatives from each were asked to testify about the soundness of the methods used by the other, a move that reinforces the difference between an eyewitness and an expert witness.

From the onset of this case, everyone involved expressed unified opinion that public perceptions of the science behind DNA would play a major role in the outcome. In a move I take to be quite irregular, the Superior Court Judge who preceded over the original criminal trial provided the jury an opening statement replete with warnings against thinking that the scientific evidence they would hear resembles what they see on police procedurals (2013, p. 85). The prosecution's opening statement announced, “This case was solved by science” (2013, p. 127). Robinson, who would later represent the prosecution solely to conduct the examinations of the expert witnesses, repeatedly asked Fishburn to explain how her DNA methods differ from those seen on TV, and Fishburn consistently answered that her methods take more time and offer more probabilistic results.

At times, Robinson crafted questions that transform these differences from a perceived liability into a key facet of the prosecution's case. Late in the trial, these two challenges resurfaced as Robinson asked Fishburn to address the case's main question: Given that genetic science failed to identify Gregg's killer in 1999, why should the jury trust it now? The eyewitness/expert witness distinction surfaced because Fishburn was asked to validate methods and test results used by Strand Laboratories, a private company in the Indianapolis area to whom the Indianapolis/Marion County Crime Lab frequently offers subcontracts. Robinson took great care to turn Fishburn's distance from the actual experimentation into a liability through the following exchange:

Q: ...As a DNA analyst for Marion County [Crime Lab], did you review all of that documentation [that Strand provided about their DNA tests]?

A: Yes, I did.

Q: And you testified that, you know, DNA is kind of a lengthier process than we might be accustomed to if you watch television and you rely on that, correct?

A: That's correct.

Q: At that point, then, were you relying just on the report from Strand or were you conducting your own independent evaluation based upon all the documentation that was given to you?

A: I was performing my own evaluation based on the data that I received from Strand Laboratories.

Q: And at that point then did you compare—we heard testimony from Ms. Llewellyn [of Strand Laboratories] about identifying various DNA profiles to unknown male number one, unknown male two, and unknown male number three. At this point then,

with the standards that you have, did you analyze those to determine if those DNA profiles could be either matched to or excluded from those known individuals?

A: Yes, I did.

The significance of this passage is best understood by walking through it backwards.

Robinson's final question about whether Fishburn was able to match or exclude samples is, in Toulminian terms, a question about whether Fishburn was able to make claims based on the data she was provided. Robinson uses the terms “match” and “exclude” because Fishburn herself had introduced these terms to the jury moments earlier via a PowerPoint presentation (the same one referenced in 1.1) Robinson's preceding questions asked Fishburn about the data she used to make these claims, which in this case consisted of standards (DNA samples taken from a known individual) and the test results Strand Laboratories provided on the same set of samples. In Robinson's previous examination of Llewellyn, she established that Strand Laboratories and the Indianapolis/Marion County Laboratories both use STR testing. The documentation upon which Fishburn relied to make her claims was Strand Laboratory's documentation regarding these tests. In this passage, then, Fishburn was asked to function as an expert witness in the purest sense. She was called on to render conclusions, and as per IRE 702, she need not have been an eyewitness to any of the testing in question. Instead, her education and experience must qualify her to know whether the final provision of IRE 702 was met—that the results being presented in court were produced using sound methodology. Because Strand Laboratories and Indianapolis/Marion County Laboratories analyzed the same data, the cross-checking of work Robinson prompted from her witness function as a miniature peer review process. In Toulminian terms, warrants are the key feature of the argument Fishburn was asked to contribute; she was queried as to whether the claims are trustworthy given the type and quantity of available data.

In the questions that followed, Fishburn emphatically reiterated that the conclusions were sound; unknown male number one was a conclusive match for Frank Tiller. Fishburn's testimony corroborated not only her peer's work at Strand but also the results of the DNA database Detective Ellison had used to to reopen the cold case with Tiller as the new main suspect. A network of humans and machines generated, corroborated, and then presented the results.⁸ From the onset of Fishburn's testimony, she and Robinson collaborated to emphasize STR testing and explain the sorts of results it produces. The researchers and their methods were described to emphasize their cooperative, harmonious role in producing STR test results. The two human agents were called to the stand to corroborate the other's proper utilization of STR techniques and interpretation of results. The common thread connecting them all was a shared sense of the conclusions that could be drawn from the available data. In short, Robinson's strategy for dealing with the newness of the science which had reopened this cold case was to emphasize the accord that existed at the time of the trial among all the actors who had helped produce the evidence placing Tiller at the crime scene.

Robinson's strategy left the defense few options. The defense attorney, Mr. Fisher, no doubt realized the damage Fishburn's testimony was doing to his argument that the killer's identity could not be established beyond a reasonable doubt. Fisher attempted to forestall Fishburn's testimony at precisely the point when she was asked to reveal the name of the person her test results identified as having left DNA on several crime scene objects. Fisher based his objection on the fact that the lab technician who had performed the tests at Strand Laboratories was not present in the courtroom to testify (2013, pp. 624–5). Fisher alleged that this absence precluded the possibility that his client could confront his accuser, which would violate the defendant's Sixth Amendment rights (2007, p. 13).

8 This situation is ripe for Latourian analysis. But in keeping with this study's framework, I wish to emphasize the portability of warrants across all the actors and research sites that participated in the creation of Fishburn's testimony.

Fisher's objection almost worked. Judge Hawkins did not immediately overrule the objection, but instead called a sidebar in which Fisher elaborated on his client's Sixth Amendment rights. Hawkins turned to Robinson for a response. Robinson responded by citing a U.S. Supreme Court case, *Williams v. Illinois*, which had been decided only four months before Tiller's trial. In *Williams v. Illinois*, the Supreme Court had ruled on a situation identical to the one at hand. Williams' DNA had been run through a database and been declared a match for DNA found (but never identified) in a sexual assault case years earlier. Williams was convicted. In his appeal, Williams argued that because the lab technician who had originally tested the body fluid samples in the sexual assault investigation never testified, he had been denied the chance to confront his accuser. The Supreme Court disagreed. Citing FRE 702 (the federal statute on which IRE 702 is closely modeled), the Supreme court reiterated that expert witnesses are called on to testify to the soundness of the methods used to generate evidence, and they found that the prosecution's expert witnesses had performed this role satisfactorily (2012, p. 3). The Court reiterated that the question of whether expert testimony supports the accusations leveled by the prosecution is to be decided by the trier of fact, which both cases, was the jury (2012, p. 3).

During the sidebar, Robinson was afforded time cite *Williams v. Illinois* but not explain its bearing on Fisher's objection. Judge Hawkins abruptly asked Fisher if he were familiar with the case; Fisher was not. Hawkins overruled Fisher's objection and then offered the jury following discursive explanation of his ruling:

Ladies and gentlemen, I've previously explained to you the hearsay objection and I think you've heard rulings in this court where I've sustained the objection about conclusions being based on hearsay. There are, depending on who you talk to, over 30 objections—30 exceptions to the hearsay rule and I'm going to overrule Mr. Fisher's

objection because of some of those exceptions to the hearsay rule. It's true that at least one of the people involved in this process is not here, but the hearsay rule exceptions, in my mind at least, allow the testimony to be heard by you. Please remember, however, it's up to you to decide what the evidence means. (2013, pp. 625–6)

Had Robinson been given the chance to elaborate on *Williams v. Illinois* during the sidebar, she would likely have pointed out that the Supreme Court clarified testimony of this kind should not be admitted as an exception to the hearsay rule. Rather, it should be admitted because it accords with the essence of how expert testimony should function. Had she been given time, Robinson may have cited the following passage from the Supreme Court's decision:

Trial courts can screen out experts who would act as mere conduits for hearsay by strictly enforcing the requirement that experts display some genuine scientific, technical, or other specialized knowledge that will help the trier of fact to understand the evidence or to determine a fact in issue. Fed. R. Evid. 702(a). (2012, p. 3)

One might equivocate and say the judge ultimately ruled correctly in admitting the testimony, and so the basis on which it was admitted is moot. Such an equivocation would elide two important issues. First, witnesses can only answer what they are asked. By admitting Fishburn's testimony as an exception to rules barring hearsay (and an unnamed exception at that), the judge left both Robinson and Fishburn not knowing how much latitude they have to proceed with their planned questions and answers. Second, the *Williams v. Illinois* ruling reasserted the inseparable relationship between expert testimony and explanations of methodology. In relation to new scientific methods, this means in practice that if an expert can testify to a method's soundness, that method's novelty should not be reason for it to be excluded or admitted on the tenuous grounds of an exception to hearsay rules. The salient irony, which Robinson was never given the chance to point out, is that in *Williams v. Illinois*, the Supreme Court had in view the very same technology about which Fishburn was testifying.

3.6 CONCLUSION

Jurors face formidable difficulties in weighing expert testimony. They are given conflicting messages about the basis on which they should ascribe special status to experts, and they are made to sort through scientific arguments packaged in a forms vastly different from those commonly used by scientists themselves. Courtroom traditions limit the extent to which scientists can educate jurors about the subject the law itself declares paramount—the methodology underlying an expert's testimony. Moreover, the legal community must stay abreast of so many scientific developments that it can be difficult for officers of the court to always utilize the most applicable precedents.

Miles and Cotter concluded technical communication scholars are uniquely situated to address the difficulties jurors face (2010, pp. 110–1). Their assertion holds true regarding the difficulties jurors face regarding expert testimony, as evidenced by the results of combining previous technical communications scholarship on scientific discourse, assertions of expertise, and the social dynamics of courtroom testimony. This chapter's results suggest that warrants could play a key role in addressing these difficulties. Although jurors' decision making processes almost always remain undisclosed, it would appear that when lawyers and expert witnesses collaborate to directly and thoroughly address the warrants underlying their testimony, the jury is given the intellectual tools it needs to become not only triers of facts but pro-tem members of the relevant fields of argument. Toulmin specified that his theory of argumentation was not based on dividing people into groups based on their formal academic credentials, but rather based on ability to understand a given warrant (1958, p. 14). It can take years or even decades to earn the credentials necessary to be an expert witness, but a few

minutes of well planned testimony may be able to prepare a jury listen well to an expert witness.

CHAPTER 4: THE ROLE OF TOULMINIAN WARRANTS IN THE MAKING OF EXPERT TESTIMONY

4.1 INTRODUCTION

The previous chapter took transcripts as its object of study not only for the methodological reasons discussed in Section 2.3, but also because the transcripts record expert testimony as the jury experienced it. More precisely, a reading aloud of the transcripts would come closer to their experience. The jury could not use the suspended nature of the written word to pause the testimony's progress and analyze its meaning the way I did in the previous chapter.⁹ The previous chapter identified major challenges expert witnesses face in providing testimony and concomitant challenges the jury face in hearing this testimony. This chapter seeks to trace those challenges to their origins by examining how technical experts are trained and acculturated into being expert witnesses. It then considers how lawyers are trained to elicit expert testimony. Accordingly, this chapter examines four categories of documents that contribute to this training: Scientific scholarship that discusses technology in light of its forensic value, training materials for expert witnesses developed by consulting firms, law school textbooks, and law journal articles. Because each category of literature represents a vast repository of texts, I have limited my discussion to materials dealing with the presentation of DNA evidence. I also incorporate into this chapter discussions of interview data from Tonya Fishburn, the serologist and experienced expert witness mentioned in Chapters 1 and 3. In treating each of these types of data, I explore the implicit or explicit means through which Toulminian warrants are treated.

⁹ Juries are almost never provided court transcripts during the trial, and if they were to ask for an expert witness to repeat a response, this request would likely sustain an objection from opposing counsel on the grounds of having been already asked and answered.

4.2 SCIENTISTS TRAIN EACH OTHER TO BE EXPERT WITNESSES UNDER THE LAW'S IMPRIMATUR

In 1989, a double homicide case in New York caught the attention of *Science* magazine writer Roger Lewin. The defendant, José Castro, was accused of murdering a pregnant woman and her two-year-old daughter in their Bronx apartment (1989). Of particular interest to Lewin was the innovative and ultimately unlawful corroboration on the part of all expert witnesses involved in this case. Scientists representing both sides of the case recognized that the novelty of DNA evidence in the courtroom (the first U.S. case utilizing DNA evidence had occurred only two years earlier) necessitated greater caution to ensure their clarity and accuracy of their testimony. In an unprecedented move, DNA experts representing both sides convened before the trial began to discuss whether the evidence met the admissibility standards set by *Frye* (Lewin, 1989). (*Daubert*, which would clarify these standards, would not take effect until four years later; both cases are discussed in section 1.3.1). The scientists invited leaders from the law enforcement community, including the FBI, but excluded all the lawyers involved with the case. In effect, the expert witnesses tried the case then and there. Opinions diverged widely, and egos flared, but eventually, the meeting resulted in the issuing of a report in which the scientists issued a unified opinion about the evidence's admissibility and soundness. The report formed under the leadership of genetic experts Richard Roberts and Eric Landis, who galvanized the other experts into finalizing the document. Their report critiqued not only the reliability of DNA testing methods available at the time but also the legal system's apparatus for assessing reliability. In his *Science* article, Lewin quotes the report's following passage:

All experts have agreed that the *Frye* test and the setting of the adversary system may not be the most appropriate method for reaching scientific consensus...The *Frye* hearing is not the appropriate time to begin the process of peer review of the data.

Initiating peer review at this time wastes a great deal of the court's and expert's time.

The setting also discourages many experts from agreeing to participate in the careful scientific review of the data. (1989)

Elsewhere in the report, the scientists unequivocally proclaimed: "Overall, the DNA data in this case are not scientifically reliable enough [to reach a conclusion]. If these data were submitted to a peer review journal in support of a conclusion, it would not be accepted" (1989).

Unmistakably clear in these passages, from a Toulminian perspective, is the centrality of warrants. At their cabal, the scientist's deliberations evidently focused on what kinds of claims should be considered authorized in light of the data provided them via recently developed DNA testing methods. Their appeal to the peer review process within their discipline calls attention to two specific aspects of Toulmin's theory of the warrant. First, warrants are field-dependent (1958, p. 98, See also Section 1.2). The experts claimed that practitioners of their home disciplines (biology, in most cases) would not accept claims matching the defendant's blood to samples from the crime scene on the available data. Second, Toulminian scholars would recognize in the scientists' protest the allegation that no one has yet provided a sufficient warrant-establishing argument regarding the available data (1958, p. 120, See also Section 1.2). In other words, the scientists claimed that none of their peers has yet stated what they deem a cogent case for making identity-match claims from this type of data.

In sum, the scientists argued their case in precisely the way Toulmin anticipated. The legal community, however, imposed its own decision making criteria on *New York v. Castro*. The defense wanted to admit the DNA evidence, gambling that even though it matched Castro to the crime scene, the expert's strong warning against trusting it would make the prosecution appear to be grasping at straws. The defense used a legal technicality to bypass the scientists'

consensus. They forced several experts to the witness stand not to render opinions, but simply to describe the contents of the lab reports (Lewin, 1989). So, if the scientists won a battle by convening to discuss the relevant science in a non-adversarial way, the defense won the war by exercising the imprimatur the law ultimately retains for itself regarding the compulsion of testimony.

New York v. Castro, which caught the attention of federal law enforcement agencies from its onset, would eventually catch the attention of the U.S. Congress, who would in turn further clarify the means scientists can utilize to help each other testify as experts. Only one year after *Castro*, Congress' Office of Technology Assessment issued *Genetic Witness: Forensic Uses of DNA Tests*, a 200-page report calling for new federal guidelines that would regularize expert testimony about DNA evidence. In addition to being a primer in DNA science for Congresspeople, the report is a strident plea to the scientific community to provide lawmakers with guidance about new DNA testing techniques. The report makes no attempt to elide the fact that this guidance would in turn be used to author laws standardizing (and hence, restricting) such testimony. The report's central theme and urgent tone can be seen in passages like the following:

Setting standards for forensic applications of DNA testing is the most controversial and unsettled issue. Standards are necessary if high quality DNA forensic analysis is to be ensured, and the situation demands immediate attention.

(1990, p. 10, emphasis original)

The implied argument seems to be that the scientific community benefits as well by the ensuring of high standards, the standards they must help construct.

In another passage, the report specifies its call for action, in doing so, highlights the relevance of warrants in the government's role in shaping expert testimony. The report's third chapter considers DNA testing techniques which then represented science's cutting edge, including the techniques at the heart of *New York v. Castro*. Wanting to keep apace with science but wanting also to ensure the reliability of all admissible results, the OTA issues the following resolution:

For forensic DNA analysis, **questions exist about the appropriateness of using certain procedures over others, how data are interpreted, or about the extent or type of quality control and quality assurance to minimize human factors and ensure that a particular *test result* is reliable.** (1990, p. 60, all forms of emphasis original)

Toulmin is not quoted as a source in the report, but the resemblance of OTA's language in the preceding passage to Toulmin's theory of the warrant is remarkable. The OTA singled out the interpretation of data and the regularization of methods as the sufficient conditions for creating admissible test results. The OTA here commissioned the creating of the warrant-establishing arguments needed for fair trials.

The legal and scientific communities both heeded the OTA's call. The four years that followed publication of *Genetic Witness* saw major contributions from both communities that would set a pattern still in tact by which scientists help each other prepare to testify. In 1993, the U.S. Supreme Court issued the *Daubert* ruling. As discussed in Section 1.3.1, *Daubert* required that when ruling on the admissibility of all expert testimony, judges should consider its “testability, peer review, standardization, and general acceptance” (Golan, 2008, p. 935). Scientific scholarship on DNA published shortly after *Daubert* demonstrates sensitivity to these criteria. In 1994, the *Proceedings of the American Academy of Arts and Sciences* published an article called “Likelihood Ratios for DNA Identification” in which the authors argue the following:

Adoption of likelihood ratios (LR's) for DNA identification (with different but consistent LRs for exclusion, coincidence, and kinship) will increase efficiency and reliability, provide a rigorous solution to the search for conservative presentation of evidence, disarm criticism, and become more comprehensible to the court. (Collins & Morton, 1994, p. 6007)

Language borrowed directly from *Genetic Witness* and *Daubert* appear in their article's thesis, signaling an effort within scientific community to respond to the legal community's call for clearer, more regularized evidentiary standards. The article described the thresholds of statistical certainty DNA tests must yield in order for scientists to make each of the three types of claims mentioned in their thesis. The authors explained that exclusion (i.e. claiming a sample does not match a known individual) requires the least data and hence the lowest threshold, while the distinction between kinship and coincidence (which today is called "inclusion") is harder to map. Both claims involve relatively high degrees of similarities in the DNA results, so the authors pioneered a means called the "coincidence test" through which a suspect's genetic markers might reliably be distinguished from a relative. Collins and Morton developed this test with both science and legal rhetoric in mind. They anticipated that their scientific colleagues, while testifying, would need a special tool to respond to attempts by the defense to argue that the DNA samples in question belong to a relative, a rhetorical move Collins and Morton called "the most persistent and troublesome issue raised by the defense" (1994, p. 6008). They cautioned their colleagues that their newly developed method, while scientifically reliable, has limited rhetorical utility in the courtroom: "The coincidence test is designed to protect the suspect against a chance match but does not protect against [being mistaken for] a related culprit (1994, p. 6008).

Toulminian warrants pervade Collins and Morton's rhetorical advice to their fellow scientists. In essence, their entire article is a discussion of which sorts of claims should be considered authorized in light of newly available data analysis methods. Toulmin's observation that warrants are field-dependent sheds light on the complex disciplinary dynamics underlying Collin's and Morton's article. Writing in the wake of *Daubert*, they needed to highlight the regularized nature of their new methods and argue that their scientific peers should accept the methods *so that* those methods could in turn be used in court. Writing four years after the *Castro* ruling, Collins and Morton also needed to become *ad hoc* rhetoricians. Because expert witnesses could no longer confer among themselves about the particular arguments both sides of the case would make, their preparation for the courtroom would of necessity become a quintessentially Aristotelian endeavor of seeing the available arguments in a given situation (2006, pp. 37–8). Accordingly, Collins and Morton shaped their scientific inquiries toward “persistent” courtroom issues. Such an enmeshment of science and rhetoric was inevitable in the aftermath of *Daubert*, but the exclusion of professional rhetoricians from the fusion of these disciplines was not. In any event, the disciplinary dynamics into which Collins and Morton wrote also featured an enmeshment of biology and statistics. All the claims Collins and Morton prepared their colleagues to make from the witness stand are matters of probability. The questions the witnesses are called upon to answer are simple, i.e. whether a given sample came from a known individual. The statistical analyses an expert must perform to formulate answers are likely inscrutable to anyone without vast experience applying statistics to biology. The passage below (copied from their article to preserve equation formatting) constitutes Collin's and Morton's advice for testifying about DNA samples from alleged siblings:

Sibs are the most common bilinear relatives. If they are not inbred the matching probability (21, 23) is

$$P(E_c|E_s, H_0) = \begin{cases} (1 + 2q_r + q_r^2)/4 & \text{if } r = s \\ (1 + q_r + q_s + 2q_r q_s)/4 & \text{if } r \neq s, \end{cases} \quad [13]$$

with mean (16)

$$\bar{P}(E_c|E_s, H_0) = [1 + 2\sum q_r^2 + 2(\sum q_r^2)^2 - \sum q_r^4]/4. \quad [14]$$

This is a special case of regular (noninbred) bilinear relatives with probability c_p of having p genes identical by descent and conditional matching probability t_p , where

$$\begin{aligned} t_0 &= \begin{cases} q_r^2 & \text{if } r = s \\ 2q_r q_s & \text{if } r \neq s \end{cases} \\ t_1 &= \begin{cases} q_r & \text{if } r = s \\ (q_r + q_s)/2 & \text{if } r \neq s \end{cases} \\ t_2 &= 1 \\ \bar{t}_0 &= 2(\sum q_r^2)^2 - \sum q_r^4 \\ \bar{t}_1 &= \sum q_r^2 \\ \bar{t}_2 &= 1 \end{aligned} \quad [15]$$

$$P(E_c|E_s, H_0) = \sum c_p t_p$$

$$\bar{P}(E_c|E_s, H_0) = \sum c_p \bar{t}_p$$

$$\varphi = c_2/2 + c_1/4.$$

There is considerable variation among LR's for the kinship test, depending largely on the model and magnitude of kinship (Table 1). The appropriate choice rests with the court, not the expert witness, who should, however, be well versed in the evidence on human population structure and its implications for the kinship test.

(1994, p. 6009)

Collins and Morton make no attempt within their article to coach their colleagues about the extent to which the preceding equations and the rationale behind them should be directly presented to the jury. I daresay losing the jury amid the equations seems a distinct possibility, a fair concern to raise given that Collins and Morton declared at the outset of their article their intention to make DNA evidence “comprehensible to the court” (1994, p. 6007).

I fully grant, however, Collin's and Morton's adeptness at anticipating the kinds of arguments expert witnesses would need to anticipate to become effective witnesses regarding DNA evidence. Twenty-two years after the publication of their article, expert witnesses still face the same fundamental challenges. Tonya Fishburn, a forensic serologist for the Indianapolis/Marion County Crime Laboratory, agreed to be interviewed for the sake of this project. Asked about the difficulty in translating expressions of probability into terms the jury can understand, Fishburn first asserted her commitment to scientific method, and then explained the challenge of being clear in light of that commitment:

When I approach being an expert witness, my goal is to get the information to the jurors about what I have tested, and to make it clearer to them. So, whether it supports the conviction or doesn't support the conviction, I don't really worry about [that]. I do think one of the biggest challenges during expert testimony is showing the strength of the match. If you say [a sample] matches an individual, well, what does that mean? Does it mean that it came from that individual? It may not mean that it came from that individual...you have to look at the rarity of that profile in that population. And, really trying to explain the statistics is one of the harder parts of my testimony—trying to explain what the statistics mean. (2015, p. 135)¹⁰

To frame Fishburn's quote in Toulminian terms, she identified the clear presentation of data (she calls it “information”) as her main goal and guiding principle for professional practice. Likewise, the articulation of warrants is her duty, as evidenced by her insistence on parsing out the meaning of claiming to have enough data to support claiming a DNA sample matches a known individual. The act of making claims, though, Fishburn demarcated as the lawyers' prerogative; she invoked critical distance from the question of which side may benefit from her testimony. The methods Fishburn utilizes in her laboratory are entirely different than those

¹⁰ Page numbers in citations of Fishburn's interview refer to the page numbers of Appendix C, which reproduces the complete interview transcript.

examined by Collins and Morton, but the complicated ethical and epistemological components of expert testimony remain unchanged. Like those who took the stand when DNA analysis was a nascent science, Fishburn must strive for clarity and impartiality while articulating her work in a way that preserves the complexity of her methods and the probabilistic nature of her results.

Fishburn explained that her commitments to scientific method and clear exposition sometimes come into direct conflict with lawyers' determination to win. When asked to elaborate on the difficulty of presenting statistics to the jury, she referenced a tactic prosecutors use to make a DNA match to the defendant seem more probable. As Fishburn explained, the tactic is questionable not only due to its disregard for mathematical principles but also because of its racial implications:

Fishburn: If I say a profile matches to an individual, [I must also consider] who else could that profile match to? So then, I have to do statistics to show how rare that profile is in the population. So, it may be one in four billion Caucasians or one in five billion African Americans. We look at the three ethnic groups which are the common ones in Marion County. One thing I notice prosecutors tend to do is they focus on [the fact that] the client is African American, so [consequently, the lawyers say], "We're just going to look at the African American statistics." You can't do that, because, you're looking at how rare the profile is in the population, so you also do want to look at the other ethnic groups to see how rare is it in Caucasians, how rare is it in Hispanics, because you're not talking about the ethnicity of that [DNA] profile. You know the ethnicity of the suspect, but you're just [supposed to be] looking at the rarity of the profile.

Redington: So, as a scientist, you have a methodology; that methodology requires considering population in a certain way. The prosecutor, probably for rhetorical and legal reasons, wants to narrow the pool in a way that would interrupt or even undermine the scientific methodology, which you want to keep as is.

Fishburn: Right. Exactly. Yeah. I do see that a lot. (2015, p. 136)

In the passage above, Fishburn described ethical dangers of testifying as an expert that resemble those experienced by Melissa Hamstra, who, in *Villegas v. Indiana* was compelled to answer questions under conditions that appeared to demand her obeisance to an array of patriarchal views (see Section 3.3). Fishburn's comments suggest that expert witnesses may be asked inherently racist questions, and she stressed elsewhere in the interview that expert witnesses have little recourse to reframe a question while answering it (2015). Surely, the ethical dilemmas related to expressing complex scientific concepts to public audiences are weighty enough. Asking them also to wade through quagmires of racist and sexist assumptions makes testifying as an expert an almost untenable task. This ethical component receives little if any attention in scholarship scientists produce for one another about preparing to be an expert witness.

4.3 ON-THE-JOB RHETORICAL TRAINING FOR EXPERT WITNESSES: A NEW PERIPATETIC SOPHISTRY

Despite being fraught with dilemmas, the act of providing expert testimony is a large and growing endeavor. More and more questions can be addressed by experts, so even nominal drops in crime rates are not likely to decrease the overall need by prosecutors to call experts. In a recent *Indiana Law Review* article, Indiana Court of Appeals Judge Cale J. Bradford published the results of an empirical study of the number of appealed cases in which IRE 702

was an issue. He found a significant upward statewide trend in both civil and criminal cases involving IRE 702 (2015, p. 1123). Insofar as as IRE 702 rulings can be taken as a bellwether of the overall incidence of expert testimony, it appears to be a growth industry in Indiana. A less empirical but more visible indication of the growth of the expert testimony industry is the prevalence of commercial websites offering training to scientists to improve their effectiveness as expert witnesses. Websites such as Bodetech.com and Seak.com tout seminars and training materials promising to prepare technical experts to face any challenge in court. Access to the training seminars is outside the scope of this project's IRB permissions. The seminar enrollment forms suggest that employment in a technical discipline is prerequisite to attend (SEAK, Inc.,” n.d.), (Bode Cellmark Forensics, n.d.). Moreover, these seminars would not likely fall under IRB Exception IV, standard educational practices. However, the founders of SEAK.com, Steven Babitsky and James J. Mangraviti, have published a number of books designed to train technical experts to witness in jury trials.

Two of their books draw strong connections between Toulminian warrants and the principles of effective jury trial testimony. In one of their earlier books, *How to Excel During Cross Examination*, Babitsky and Mangraviti compiled an extensive table matching contestable issues with the profession from which an expert must hail in order to address that issue in court (1997, pp. 15–21). Later in the same chapter, however, they qualified the simple notion of matching a given issue to a particular academic discipline by warning that whatever an expert's home discipline, they make sure they have specific familiarity with the technical issues at hand (1997, p. 38). In effect, they warned that disciplinary identity is insufficient; a working knowledge of relevant warrants is a necessary condition for effective testimony. In a book that followed eight years later, the authors revisited this theme with greater emphasis. *How to Become a Dangerous Expert Witness* contains a chapter called “Bulletproofing Your Opinion,”

which offered abundant advice admonishing expert witnesses to engage directly in discussions of methodology. For example, when an expert witness is cross examined about why he or she has given an opinion contrary to that held by one of their peers, the witness is advised to provide a critique of the method used by the peer (2005, p. 62). They also gave advice that Fishburn clearly adopted in preparing to testify in *Tiller v. Indiana*: “Obtain and review all relevant documents with care” (2005, p. 68). In elaborating on this advice, the authors admonished experts to use these documents to form the opinion and achieve sufficient familiarity to aid rapid recall on the witness stand (2005, pp. 68–9). Woven through all this advice are the authors' repeated warnings that lawyers' sole concern is winning, and that an expert witness will come under attack from all sides.

4.4 LAW SCHOOL TEXTBOOKS: ENGENDERING A COMMITMENT TO AGONISM AND THEATRICALITY

In the courtroom, expert witnesses can utilize their communicative skills only insofar as lawyers formulate questions that put these skills on display. As discussed in Chapter One, lawyers' examinations of expert witnesses is characterized by control, fierce competition, and attention to building or breaking a witness' credibility. These behaviors enact attitudes extolled in law school text books. In fact, law school text books present the adoption of these behaviors and attitudes as a necessary part of being apprenticed into the legal profession. Accordingly, lawyers are urged to adopt a wily, aggressive comportment toward witnesses even before the trial begins. Depositions, in which sworn testimony is recorded and transcribed at a pretrial meeting, often represent the first personal interaction between a lawyer and expert witness. Henry L. Hecht's *Effective Depositions*, a textbook promoted by the American Bar Association, is a thorough, encyclopedic treatment of planning, producing, and using depositions (2010). The textbook displays an ardent interest in helping lawyers employ any manner of

aggressiveness or chicanery not expressly prohibited by law as they handle depositions. The following lengthy passage from Hecht's discussion of how to arrange the chairs and tables in the room where the deposition will take place is worth reproducing in full due to the aplomb with which it promotes its underhanded tactics. It begins by advising the lawyer conducting the deposition (called the "taker") to sit diagonal from, rather than directly across from the witness because

A study at a Canadian hospital found that when people sat at a rectangular table, cross-corner conversations...were six times more frequent than cross-table conversations. Thus, a right-angle seating arrangement may promote greater intimacy between you and the witness. It may also turn the defender [the lawyer representing the witness] into something of an outsider. At a minimum, it removes the defender from your direct line of sight. If the deposition has a window—especially one with a view—you might try seating the witness and her defender so that they face it. The idea is to distract the witness—or her lawyer—in the hope that one or both will become more unguarded. (2010, p. 243)

Hecht drafted his advice in the preceding passage for depositions in general, not just for depositions of expert witnesses. However, Babitsky warned civil engineers to expect similar treatment if deposed as experts. In a brief article in *Civil Engineering*, he claimed that lawyers will "...probe you for any potential bias, explore your factual assumptions, and try to use your opinions to bolster their own positions. They may also try to intimidate you" (2001, p. 54).

These behaviors persist once the trial begins. University of Arizona Law School professor Thomas A. Mauet's textbook *Trial Techniques* offers the following advice about how to manage direct examination: "The direct examination should be the jury's opportunity to relive reality from your side's perspective. The witness should show, not tell, the jury what happened

so that the event is recreated for the jury's benefit” (2002, p. 95). Mauet's proposed techniques for accomplishing this goal revolve around a motif he introduces near the beginning of his discussion of direct examination: “A good direct examiner is like the director of a film crew” (2002, p. 96). He accordingly tells direct examiners to phrase their questions in the present tense (2002, p. 108), to spend the most time discussing the “critical part” of the witness' testimony, and to arrange the discussion of events chronologically (Mauet, 2002, pp. 96–7). In discussing cross examination, Mauet continues the motif of lawyer-as-movie-director. However, now the lawyer is encouraged to foster a sense of aggression in her efforts to win. In explaining impeachment, the legal term for undermining witness credibility, Mauet says, “Impeachment is the most dramatic trial technique in the lawyer's arsenal. Selectively used and effectively deployed, it can have a devastating effect at trial” (2002, p. 273).

Just how devastating impeachment can be Melissa Hamstra discovered while testifying in *Villegas v. Indiana*. It would appear she fell victim to behaviors into which law school students are apprenticed. To my previous analysis of her plight (See section 3.3), I add the following observation: There is little room for an expert witness to articulate her warrants amid questions designed to stage a dramatic confrontation. Hamstra's impeachment consisted of the defense counsel and trial judge agreeing that Hamstra should not be allowed to attempt to establish her qualifications to testify about the cause of the victim's bruises. The prosecution, who had called Hamstra to the stand, tried to defend her credibility on the grounds of her formal education and considerable professional experience. But when the court rejected these attempts, the prosecution made no attempt to establish her credibility based on her familiarity with the specific methods (and hence, the relevant warrants) used to perform causal analysis on bruises.

Mauet's advice that lawyers should prompt witnesses to present their testimony in chronological order may also impede the ability of expert witnesses to discuss relevant warrants. Because Mauet's advice does not instruct law students to distinguish between an organizational strategy for eyewitness testimony vs. expert testimony, the clear implication is that a chronological approach works for both types. It is advice that bears a clear imprint on courtroom practice. As I discuss in Section 3.1, expert witnesses are often required to recount their experimental procedures in chronological order, a process which can become especially tedious in cases involving DNA test results. Only after the testing procedures are described is the expert asked to articulate her conclusions. In her interview, Fishburn mentioned her concern that due to their fatigue and the complexity of DNA testimony, juries sometimes struggle to maintain their interest and attention. Fishburn said this problem is exacerbated by lawyers frequently choosing to present their expert witnesses late in the trial's overall development (2015, p. 138). Quite possibly, lawyers make this choice hoping expert witnesses will clinch the case, or in Mauet's analogy, to be the movie's action climax.

4.5. LEGAL SCHOLARSHIP: QUANTIFYING REASONABLE DOUBT

Fishburn said the presentation of DNA evidence at trial inevitably becomes a discussion of statistics (2015). In their recent *Stanford Law Review* article, Ian Ayres and Barry Nalebuff proposed a new approach to presenting such statistics. Based on their retroactive application of Bayesian statistical principles to two prominent California criminal cases, Ayres and Nalebuff argued that their approach is both more scientifically accurate and rhetorically powerful than current approaches. A major means through which they defended their main assertion was by elucidating the nature of Bayesian logic, which involves “continually updating predictions based on the quality of additional evidence” (2015, p. 1503). Regarding DNA evidence, the need to update predictions stems from the fact that two different kinds of DNA tests are

commonly used, and each is typically utilized at a different point in the trial's development. For the last several years, anyone arrested in conjunction with a violent crime has been required to proffer a DNA sample which is then added to a nationwide database. These databases then become a principle means of investigating crimes. An early step in most criminal investigations is the collection of any potential DNA samples, which are then compared against the database in a technique called "trawling" (2015, p. 1450). When the police find matches, they focus their investigations on suspects the database identified, such as in *Tiller v. Indiana* (See Section 3.5). If the newly focused investigation incriminates suspects identified through the database, forensics labs will search for direct matches between newly drawn samples from the suspect and samples recovered from victims or from the crime scene, such as in *Carpenter v. Indiana* (See Section 3.2). The fact that trawling is often a prerequisite step to direct matching presents a challenge to expert witnesses in that it requires them to make difficult decisions about using statistics to describe their confidence in the results. As DNA databases swell in the number of included profiles, the chances increase that trawling will produce a false match (2015, p. 1451).¹¹ Meanwhile, the technology for identifying direct matches grows ever more certain. Thus, Ayres and Nalebuff frame the issue in this way:

The source probability [produced through direct matching] is not the same as the chance of a random DNA match [produced through trawling] and does not equal the probability of guilt; even if the defendant was the source of the forensic DNA, the defendant might not have committed the crime" (2015, p. 1450).

They proposed Bayesian logic as an answer to this conundrum because through this approach, the expert witness is able to argue that there is a very low chance that trawling would produce a false positive that would then be repeated through direct testing. In other words, if direct

¹¹ Ayres and Nalebuff explain that database matches operate on the assumption that no two DNA profiles match (except for those of identical twins) and that the methods used to determine a database match are completely reliable. They point out that the theoretical possibility that either of these assumptions is wrong becomes a weightier issue as the aggregate number of profiles in nationwide databases increases (2015, pp. 1451, 1463–4).

matching can be considered new information that can be used to update assumptions about prior information gleaned from trawling, the rapid growth of DNA database rosters does not present the same problem scientifically or rhetorically.

Like Mauet's and Hecht's textbooks, Ayres and Nalebuff's article demonstrates a commitment to agonism. Ayres and Nalebuff demonstrate acute awareness that their proposal seems to inordinately favor the prosecution, and that greater degrees of standardization within expert testimony would foreclose argumentative opportunities for lawyers. They anticipate that their proposal would fuel current sentiment along this line: "Some legal analysts have been dismayed by the ways in which evidence of a DNA match tends to eclipse any role for adversarial engagement—turning litigants into little more than potted plants" (2015, p. 1451).

However, unlike the textbooks, this article demonstrates commitment to keeping rhetorically powerful testimony in harmony with sound scientific methods. This commitment is evident not only through the nature of their thesis, but also through their methodology, which attempted to essentially retry two cases to demonstrate how both scientific and legal concerns would benefit from the application of Bayesian logic. And although the article clearly assumes lawyers and expert witnesses as its audience, it ultimately reveals the plight of jurors as its central priority:

Moreover, we think it is irresponsible to believe that jurors can somehow figure out all on their own how to estimate priors and how to aggregate prior beliefs with information from database matches. This is asking jurors to rediscover Bayes' rule without any help. Worse still, if jurors are denied knowledge of how the match was found, then they don't have any basis on which to form a prior. Somehow courts think it is better for jurors to rely on uninformed and ignorant prejudices than to risk confusing them with the relevant data to make an informed decision. (2015, p. 1500)

If it can be granted that a law school textbook is intended to represent an earlier stage in a lawyer's professional development than does a law journal article, perhaps one can also hope that the narrow agonism espoused in textbooks is intended to develop into a more responsible view of adversarial courtroom practices. By thoroughly addressing the ethical, epistemological, and rhetorical dimensions of DNA testimony, Ayres and Nalebuff present an important strand of intellectual labor that must continue for the courtroom to remain a venue in which scientific best practices are presented clearly.

4.6 CONCLUSION

Expert testimony is the confluence of two disparate types of professionalization. In training each other to testify via scientific literature, technical experts thoroughly cover the methodologies behind the technologies upon which they will expound in court. They may, however, lose sight of how to make these concepts understandable to juries. Lawyers, on the other hand, are apprenticed into dogged agonism while in law school. As law journals lend increasingly thorough attention to the topics on which experts testify, this agonism may be modulated.

CHAPTER 5: IMPLICATIONS, LIMITATIONS, AND PLANS FOR FURTHER STUDY

5.1 INTRODUCTION

This chapter begins by elucidating holistic implications, ones that can be seen only with the benefit of retrospective analysis on both of the study's stages. Then, I describe this study's limitations with particular emphasis on construct validity and lost opportunities to conduct research at the intersection of technical writing and public rhetoric. Finally, I chart a course for three distinct future projects that grow from this study.

5.2 IMPLICATIONS: SEEKING SYNCHRONIZATION BETWEEN DISCIPLINES MOVING AT DIFFERENT SPEEDS

5.2.1 Implications for Jurors: Judging Twenty-first Century Science by Eighteenth Century Notions of Certainty

Jurors asked to weigh expert testimony find themselves caught in what Madeleine L'Engle might call a wrinkle in time. Barbara J. Shapiro described this situation in terms of the outdated assumptions about certainty, pathos, and reason jurors are still required to apply as they weigh testimony. In "Beyond Reasonable Doubt: The Neglected Eighteenth-Century Context," Shapiro traced our legal system's current notions of certainty back to the British Enlightenment's debates about the reliability of observation-based experimentation versus the reliability of testimony. Her historical analysis reached similar conclusions as Golan's (See

Section 1.3.1). Like Golan, Shapiro concluded that the proclivity among leaders of the British Enlightenment to elevate data derived from first hand observation above all other forms of knowledge resulted in a corresponding elevation of eyewitness testimony over all other forms (2014, p. 25). Complicating this distinction, however, was the question of revealed religion. Locke, Campbell, and Hume extensively debated the reliability of eyewitness accounts of miracles—events which seemed to violate the laws of nature (2014, pp. 40–1). Shapiro argued that this debate produced the notion of moral certainty that would eventually give rise to our current notions of reasonable doubt. She pointed to Edward Bentham's textbook on logic, a standard text at Oxford in the 1770's, a means through which this notion would become introduced to Britain's elite thinkers. Bentham describes moral certainty as an obligation, on the hearer's part, to lend increasingly greater weight to belief in a probabilistic outcome the more frequently the outcome has been repeated (2014, p. 39). Bentham maps an approach that encourages jurors to modulate the act of elevating eyewitness testimony above all else by considering what we might now call external validation. Therefore, instead of hearing testimony through a binary construct (eyewitness accounts vs. everything else,) listeners were admonished to place testimony along a spectrum of certainty. Somewhere along this spectrum is the threshold of reasonable doubt, which Bentham defines simply as cases in which “we may be so certain, as not to have any reasonable cause of doubting” (2014, p. 40). Although hearers are admonished to consider external validation—an admonition that would seem to move the weighing of testimony away from morality and into science—most interlocutors in the Enlightenment debate about reasonable doubt agreed that morality could not be deconvolved from this act. As already mentioned, a hearer would need to consider whether the testimony has implications about faith-based metaphysical beliefs. Second, Shapiro's study suggests a strong consensus among Enlightenment thinkers—even among those with vastly different views about

religion—that one must query his¹² conscience while placing testimony along the spectrum of certainty (2014). American literati were deeply influenced by this notion of certainty and its implications for jury trial practices. Shapiro's study named American revolutionary James Wilson as a key figure in the incorporation of reasonable doubt into American trial practice (2014, p. 47). Specifically, Shapiro argued that Wilson was the first American scholar to begin suggesting specific precedents for placing courtroom testimony above or below the threshold of reasonable doubt (2014, p. 47).

Shapiro's study concluded that today's jurisprudential scholarship continues to invoke the language of reasonable doubt without considering its origin, implications, or nuance. My own study corroborates this finding. The four distinct challenges identified in Chapter Three all stem from the disjuncture between the standards of proof lawyers must meet to win cases and the standards of proof scientists use to vet their results. Fishburn corroborated this finding in her interview for this project. One of her responses included an unprompted description of the difficulty of responsibly and clearly conveying the degree of certainty she felt in her results. Her introduction of this topic prompted the following exchange:

Redington: There are legal standards about certainty (reasonable doubt, beyond the shadow of a doubt, but that's not usually the burden for homicide cases) and then science has its own way of expressing certainty.

Fishburn: Yes.

Redington: Do those scientific and legal standards of certainty—those descriptions of what it means to be certain and how you get there—does the fact that there are those two standards, does that add to the challenge of being an expert witness? (2015, pp. 134–5)

¹² Donna Haraway would be quick to point out that both science and law systematically excluded women at this time (See Section 1.3.1).

Rather than simply responding in the affirmative, Fishburn gave a specific example of this difficulty. She began describing how difficult it was to convey to the jury what serologists mean by declaring two DNA samples a match. It was in describing this specific difficulty that she began lamenting the underhanded and racist tactics lawyers use to artificially elevate the degree of certainty she lends her results (See Section 4.2).

5.2.2 Implications for Judges and Lawyers: Appellate Jurisprudence Outpaces Trial Practices

My analysis of *Tiller v. Indiana* (See Section 3.5) emphasized the importance of the prosecution's citing of *Williams v. Illinois*, the 2012 U.S. Supreme Court case that clarified the right of expert witnesses to testify about results of experiments to which they were not eyewitnesses. I lamented the peculiarity that only the prosecutor seemed familiar with this case, and I decried the haphazard reasoning the judge supplied for allowing an expert to testify about a peer's results, a decision that should have been direct and easy in light of *Williams v. Illinois*. Reviewing this study holistically suggests to me that the lag between appellate jurisprudence and trial practice may be a major factor impacting expert testimony in jury trials. For example, in my treatment of *Villegas v. Indiana*, I focused on the paternalism that precluded registered nurse Melissa Hamstra from having the opportunity to establish her qualifications to testify about the cause of the victim's bruising. In that trial, all parties—even Hamstra—agreed that in Indiana, only MD's could offer causal analysis on injuries. Yet in the year preceding the original criminal trial, the Indiana Supreme Court issued a ruling that clearly established Hamstra's right to testify as to the causes of C.A's bruises. According to Indiana Appellate Court Judge, “*In Curts v. Miller's Health Systems, Inc.*, the court concluded that, under some circumstances, a nurse could be qualified as an expert witness on medical standard of care or causation matters” (2015, p. 1130). Ironically, the very same appellate court that issued this ruling would not have been able to cite it during *Villegas v. Indiana* because neither side

mentioned Hamstra's testimony during the appeal. In practice, someone in the courtroom needs to cite the applicable case law, or it might as well not exist. Every month, appellate courts issue new decisions affecting the obligations and privileges of expert witnesses, making it increasingly difficult (yet paradoxically, increasingly important) for practitioners of the law to keep pace.

5.2.3 Implications for Technical Communication Scholars: Toulmin's Theory of the Warrant Is an Idea Whose Time Has Come

The year before Toulmin first published his theory of the warrant, Sputnik 1 orbited the earth. That same year, Francis Crick first presented his theory that DNA contained information coded in the sequence of its amino acids (National Institutes of Health, n.d.). It is quite fair to ask, in light of the Cold War origins of Toulmin's theory, whether it belongs in the Smithsonian. After all, in today's world, expert witnesses in cyber-forensics routinely testify about information that has been beamed to its terrestrial destination via satellite. Testimony about genetics, as we have seen, now occurs so frequently that experts must contend not with its novelty, but with its popular portrayal in the media.

To this question, I respond that Toulmin's theory of the warrant correctly anticipated the trend of rapid disciplinary specialization and the effect this would have on arguments based on discipline-specific knowledge making practices. At its core, the theory of the warrant operates on the notion that each academic discipline has its own way of curating valid results. The overall model of argumentation Toulmin developed around this core idea makes it possible to identify rhetorical manifestations of arguments based on discipline-specific knowledge making practices. I submit my project as evidence that as specialization within scientific disciplines increases, so too does the utility of a theory of argumentation designed to account for

specialization. In *Dorsett v. Indiana*, for example, the theory of the warrant helped explain why Dr. Joyce Carter, a medical doctor, effectively testified about bullet trajectories. In *Tiller v. Indiana*, the theory of the warrant helped explain the implicit view of science and rhetoric which the U.S. Supreme Court had recently adopted and the effect of this ruling on the expert testimony provided in the *Tiller* case.

My conclusion that Toulmin's theory has found its kairotic era is corroborated by the recent increase in technical communication scholarship employing his framework to explore situations in which technical experts address public audiences. In addition, of course, to Whithaus's study, there is the work of Philip Eubanks, who recently published a book length examination of arguments about climate change presented by experts to public audiences. In it, he specifically cites the utility of Toulmin's model in analyzing and sometimes even predicting the effectiveness of these communications (2015, p. 96).

A praxis oriented idea emerges from this implication: Technical communication scholars can utilize Toulmin's framework to refine a theory of irreducible complexity for use in the courtroom and beyond. Expert witnesses use field-specific terminology to make their claims because their claims are built on field-specific knowledge making practices. In her interview, Fishburn emphasized that her reluctance to surrender the use of field-specific vocabulary stemmed from her commitment to fidelity in her explanations of her methodology (2015, p. 133). If expert witnesses were willing to pare down their use of field-specific terms to those necessary for making the claims that drive their testimony, and if jurors were given time and space to acquire those terms, the testimony could be presented and heard with new levels of effectiveness.

Another praxis oriented idea takes Miles' and Cotter's notion of jurors-as-learners in a slightly different direction. Their project was premised on the idea that jury instructions are an important intervention point for technical writers, and I fully concur. However, even if Miles and Cotter achieve their goal of producing clearer jury instructions (and I think they will), courtroom rules still present a major obstacle to jurors' ability to be informed hearers of expert testimony. Juries are instructed against conducting any outside research about any of the scientific points raised in expert testimony. Thus, the kairotic time for technical communication scholars to help jurors to learn about the scientific issues they will encounter in the courtroom is before the jury selection process begins. I propose that technical writers should conduct new research and utilize existing meta-analyses to identify the technologies most likely to surface in expert testimony. Then, we should continue our long-standing tradition of explaining technical topics to public audiences with special focus on technologies frequently referenced in expert testimony. Judges can forbid jurors from future research, but they cannot banish from juror's minds previously acquired scientific literacy. Work in this vein has been done in the past, but the time is right for a concerted increase. For example, in the months leading up to the O.J. Simpson trial, technical communication scholar Eric Swenson collaborated with geneticist Howard C. Coleman to write brief book for public consumption that introduced the basics of DNA with the expressed purpose of making the upcoming trial's expert testimony more comprehensible (1994).

5.3 LIMITATIONS OF THIS STUDY

5.3.1 Lack of Access to Information Needed to Consider Embodiment and Affect

My project's focus on court transcripts inhibited considerations of affect and embodiment. The strictures of courtroom stenography prohibit descriptions of non-verbal information, and verbal information is recorded without any sort of editorializing. Absent from court records, therefore,

are nonverbal appeals to pathos, descriptions of body language. Indications of gender must often be inferred from names, and racial demographics of those present in the courtroom are usually limited to discussions of the victim's and defendant's identities. This study's sharp focus on explanations of methodology already tilts it toward a logocentric view of rhetoric. Its reliance on transcripts presents a limitation on its ability to broaden its perspective. Given the pathos-laden nature of the court cases considered in this study, this limitation is considerable. The fact remains, however, that very few trials are audio or video recorded. Typically, only high profile cases are recorded, and even then, these records are usually produced, curated, and kept by media outlets, not by officers of the court. Therefore, any study of such recordings would need to account for the motives that inspired their creation. Such a study would likely fall more closely under the purview of mass communication than technical writing, although promising interdisciplinary research opportunities could arise in which technical writers work alongside mass communication scholars to examine highly mediated expert testimony.

5.3.2 Cross and Direct Examination Share the Limitations of Public Interviews

What, exactly, is a direct examination? According Mauet's law school textbook, it is a performance in which a witness pulls the jury into a cinematic recreation of events (See Section 4.4). What, then, is a cross examination? As Chapter Three demonstrates, a cross examination is an eristic contest which, in its most acrimonious form, aims to destroy the witness' credibility. Into what single category, then, can both types of examinations be accurately placed? I contend that whatever else they may be, direct and cross examinations are a form of public interview. As such, they have the same pitfalls and limitations as any other form of public interview. Because sociologists have historically pioneered both theory and practice in interview-based research, several of their cautions about interviews apply to my project. Sociologists Jaber F. Gubrium and James A. Holstein claimed we now live an age when

interviews of all types so thoroughly permeate North American culture that David Silverman rightly calls us “The Interview Society” (2012, p. 30). Specifically, they argued that the prevalence of interviews in mass media has conditioned the general public to see interviews as natural and authentic. Thus, in relation to the research interview, “Atkinson and Silverman (1997) caution that authenticity should not be taken as ultimate experiential truth. Authenticity itself is a methodically constructed product of communicative practice” (Gubrium & Holstein, 2012, p. 31). In light of this analysis, it would seem that expert witnesses testimony has all the performativity of a mass media interview while also being depended on to perform the truth-revealing role of a research interview. My study considered the testimony itself and not the specific preparation processes each expert/lawyer team undertook. It was therefore beyond my reach to explore how performance and professional research standards converge to create the actual testimony recorded in the transcripts. Fishburn's interview shed light on several aspects of the expert witness preparation process, but sociologists would be quick to point out that this light was cast by yet another interview.

5.3.3 Low Response Rates Among Potential Interview Participants Effected Original Plans for Construct Validity

This study experienced an interview participation rate of about twelve percent, with Tonya Fishburn as the sole person who responded in the affirmative. This low response rate occurred even though all recruitment was done directly and included the specific rationale for the invitation. In one instance, a potential participant offered reasons for refusing. Although these reasons were provided off-the-record, I can say that they coincided with the types of concerns that are used to justify the use of snowball sampling. I later discovered that the Indianapolis/Marion County Crime Lab, which employed almost all this study's potential participants in the expert witness category, has experienced publicity difficulties in the last

fifteen years related to its expert witnesses. According to former FBI agent and best-selling author Jim Fisher¹³, between the years 2000-2003, the Indianapolis/Marion County Crime Lab was the site of a major scandal centering on its DNA experts. Although the initial allegations of a criminal conspiracy within the lab never held up, the lab's director was placed on leave and external audits revealed many violations of proper procedure (2008, pp. 233–4). I suspect this press coverage was the source of the general reticence among scientists at their lab to participate in my study, especially since the informed consent form foregrounded my interest in expert witness credibility.

I would have looked elsewhere for expert witnesses, but my IRB permissions originally forbade doing so. I had designed my study with an emphasis on construct validity. Specifically, I endeavored to identify trends through my analysis of transcripts (Stage 1) and then to ask people involved in those very cases about the trends. Hence, I originally only sought permission to interview lawyers, jurors, or expert witnesses involved with the cases discussed in Stage 1. By happenstance, almost all those expert witnesses worked at IMCCL. IRB later granted me permission to use snowball sampling to seek other expert witness interview participants. I received very few leads and no participants through this method. Even if I had, their data would not have contributed to construct validity in the way I had originally planned.

5.3.4 Lack of Access to Jurors' Information Affected this Study's Contributions to Public Rhetoric

In Chapter Two, I discussed at length the view of the public implied by the jury selection process. I argued that this view is narrow and easily manipulated. Nonetheless, if I had been

¹³ Fisher's book is not peer reviewed, but it cites media coverage of all public events to which it refers. Fisher's book therefore suffices to support my present point, which is that IMCCL had received extensive embarrassing media coverage about the credibility of its DNA experts in its fairly recent history.

given the chance to interview jurors, I could have conducted new empirical research on how these members of the citizenry weighed the expert testimony they heard. I was unable to pursue this vein of research because Indiana redacts the names of all jurors from court transcripts. This is quite an odd move on Indiana's part, and so I had assumed this information would be accessible when I designed my study. There is a strong legal argument that concealing jurors' identities violates the defendant's right to a public trial, which is why typically, states that conceal jurors' identities have passed new legislation authorizing this move (Zansberg, n.d.). Whatever its legal merits (or lack thereof), Indiana's concealment of juror identities made it impossible to do anything except infer how they process expert testimony.

5.4 PLANS FOR FUTURE STUDY

5.4.1 Replication of this Study in Other Regions

My results suggest that many factors that create challenges for expert witnesses are a function of local or regional conditions. For example, homicide cases originating in a rural area sometimes feature as expert witnesses people who would not be considered experts in a more densely populated jurisdiction that supports a cadre of science professionals. I have also found strong indications that lawyers tailor their treatment of expert witnesses in light of local perceptions of scientific expertise. Such findings indicate the usefulness of replicating my study in a variety of settings to test the degree to which local and regional factors effect the rhetorical dimensions of expert testimony in jury trials.

5.4.2 Theorizing about the Epistemic Allure of Interviews with an Experts

I endeavor in subsequent work to take a more theoretical approach to examining the epistemic functions of interviews. Sociologists have demonstrated that in North American culture, interviews are both ubiquitous and deceptively natural (See Section 5.3.2). Frequently,

interview participants are chosen to speak in their capacity as experts. For many public audiences, an interview with an expert via a journalistic outlet is the primary point of contact with specialized knowledge on a wide range of pressing issues. I plan to further my investigations into the role that cultural expectations about interviews play in shaping public perceptions of experts and the issues they address. I am particularly interested in comparing documents experts have written for scholarly audiences with their discourse in public interviews on the same topics.

5.4.3 Pedagogical Research: Regarding Advanced Undergraduates as Expert Witnesses

My immersion into the world of expert testimony has convinced me that advanced undergraduates in STEM fields should be regarded as expert witnesses. I grant the radical unlikelihood that their coursework or internships would place them on the stand as experts, but in classifying them this way, I offer more than just an inspirational mantra. From the legal standpoint, many advanced undergraduates meet the requirements of IRE 702 and 703 regarding a panoply of technologies and research methods. From the pedagogical standpoint, I have become convinced that technical writing courses are a kairotic time and place to introduce Toulmin's theory of the warrant as a means of preparing them to learn the habits of effective expert witnesses. In teaching Technical Writing (ENGL 421) at Purdue University, I developed a cohesive sequence of assignments based on the premise that the most opportune time to help experts communicate effectively about their domain knowledge is while their domain knowledge is still developing. Based on student feedback, this approach has been effective. I therefore plan to design a classroom-based study to test its effectiveness and help instructors adapt my approach to their contexts.

The results of Chapter 4 have strengthened my resolve to help emerging technical experts communicate about their domain knowledge while they are still doing their coursework. The texts examined there were all produced by and for people Bazerman would call “mature practitioners” of their disciplines. This categorization accounts for the erudition and thoroughness of these materials, but it may also help explain some significant rhetorical blind spots on the part of technical experts. For example, in Section 4.2, I quipped that Collins and Morton had drastically overestimated the average juror's appetite for displays of complex mathematical equations, and I stand by this assertion. However, I also add that it is perhaps unfair to ask scientists to interrogate knowledge making practices on which they may have relied for decades for the sake of teaching them clearer ways to communicate about these practices. However, if the practice of learning clear communication is cultivated alongside the acquisition of technical knowledge, students can form habits that will suit them well in the laboratory and the courtroom.

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APPENDICES

Appendix A: Original Research Plan for Stages 1 and 2

Below is the original text of my plans for Stages 1 and 2 of my project. For the reasons discussed in Section 5.3.3, this plan became unfeasible.

In Stage 1, I plan to examine up to twenty case transcripts. If patterns are identified, these patterns will guide the selection of cases for Stage 2. Here, a much smaller number of cases (a minimum of two; maximum of four) will be chosen to look at in closer detail. Most will be chosen because their expert testimony conforms to the patterns identified in Stage 1. However, at least one case will be chosen for Stage 2 because it exhibits non-conforming results. In stage two, the main purpose will be to interview people involved with the case. The expert witnesses themselves, the lawyers involved with the case, and the jurors will all be potential participants. My questions for lawyers and witnesses will focus on the strategies they employed in presenting methodological issues to the jury. My questions to jurors will focus on their experiences in weighing the relative merits of expert testimony.

Stage 2 as I have described it above is in its ideal form in that I am assuming the availability of interview subjects from cases studied in Stage 1. However, if the people involved in cases I have studied are not available for interview, Stage 2 could also be conducted simply by issuing a call requesting people who have participated in trials involving expert testimony to volunteer to be interviewed about their experiences. As long as I limit this pool to people who participated in criminal cases that were tried in Indiana and then appealed, I will be able to perform thorough background research on the cases in question. Both approaches have approved by Purdue University's IRB.

Appendix B: Interview Questions

IRB has approved the following questions for use during interviews:

Questions for Lawyers

1. Think of a recent case in which you utilized an expert witness. What did you say or do to build the jury's trust in the expert witness?
2. Have you used similar means of displaying the expert witness's trustworthiness in other cases?
3. Based on your experience preparing expert witnesses for trial, what strategies are most effective for making expert testimony persuasive?
4. What do you think makes these strategies effective?

Questions for Expert Witnesses

1. What did you do to address challenges related to the use of technical vocabulary?
2. What did you do to address challenges related to describing your methodology?
3. What did you do to address the challenges of explaining how your view is like or different from your scientific colleagues?
4. What other challenges did you face?
5. What would you have added to your testimony if time had allowed?

Questions for Jurors

1. As you look back on the case, what parts of the expert testimony seem easiest to remember?
2. Do you remember a moment or series of events that built your trust in an expert witness? If so, please describe these events.

3. Do you remember a moment or series of events that lowered your trust in an expert witness?

If so, please describe these events.

4. What parts of expert testimony were most difficult to understand?

5. What did you do to aid your understanding of these parts of the testimony?

Appendix C: Tonya Fishburn Interview Transcript

This interview occurred on December 3, 2015 at approximately 2:15 pm. It was conducted on the second floor of the Marion County Coroner's building at 521 W McCarty St, Indianapolis, IN. It was recorded using a directional microphone connected to a laptop running Audacity software.

LR: Okay, we should be getting good sound through the microphone. I'm going to angle it up so that it's kind of highly directional, so,

TF: Okay.

LR: Good.

TF: Can you hear me?

LR: Yup. The screen says that we're hearing you real well. So, we're almost done with the legalities, but just for the record, if I could have you just um answer a few questions. Today is December the third?

TF: Yes.

LR: And, uh, have you agreed in written form for permission for this interview?

TS: Yes.

LR: Thanks so much.

TF: [Laughs]

LR: That is an over-abundance of caution, but that's, so...now for the interesting part—the interview questions. I'll give you an overview of the questions I'm going to ask. In fact, I can just give you a sheet. The second category there is questions for expert witnesses. And, I'll give you a minute to read those over. I've put them in the order in which I think is easiest to help the conversation get rolling, but since you have the questions there, if any of them jump out at you as ones you'd like to start with, that's fine as well.

TF: Okay.

(1:25)

TF: I mean, we can start with the first one, if you want.

LR: Great. Okay. So, um, think of a case that you've been involved in, and see if you can think of a time when you had challenges in the act of testifying that were related to the use of technical vocabulary that comes out of your discipline. Can you think of a time, and if so, what did you do to address challenges related to helping the jury understand technical vocabulary?

TF: Um, well, what I try to do is to use more layman's terms. I try not to use too many technical terms. So, I try to dumb it down a little bit because you have such a variety of jurors on there, um, sometimes, I might try using analogies, uh, you know if I think that make help make it clearer to the jury. So, that's kinda the main things that I do.

LR: Can you, do you, testify about similar topics in a variety of cases? For example, you're a serologist by training, am I understanding that correctly?

TF: Well, actually, I do serology and DNA, but I would say all the things [i.e. court transcripts] you've looked at from me would be on the DNA standpoint.

LR: Yeah, uh-huh.

TF: So I've been doing DNA for the past eleven years.

LR: Okay. And, uh, I've seen, for example, short tandem repeat testing come up in several of the cases.

TF: Yes.

LR: Is that a topic, that uh, you have found helpful to use some of those techniques you described, like using analogies, finding layman's terms, is that one of those technologies that you've found it helpful to use those techniques for?

(3:15)

TF: Yes, I have. And, uh, I do use “short tandem repeat” just 'cause I have to get in that that's the kind of testing that we do, but I do try to go in and explain a little to jurors just about how what it means, you, short tandem repeat. Also, I do have a PowerPoint that I created for jurors. And, I tend to use that PowerPoint, and it has, kind of, pictures, uh, and keeps it really simple to help explain that to jurors. So, I do use that PowerPoint a lot, and I get a lot of positive feedback from using that.

LR: I've seen transcripts where...so...I've not designed my project much to deal with evidentiary exhibits; that would be a whole 'nother fascinating project. I do remember, in some projects, you mentioning that you are referring to a PowerPoint that you brought with you. Since you mentioned that, I wanted to ask, is that something—is the use of that PowerPoint something that you decide, typically, or is that something you coordinate with the prosecutor? How does that work?

TF: Um, I usually offer it up to a prosecutor, if they choose to. Some prosecutors prefer to use it; some do not. Some of it may depend on what the evidence is. Like, if I'm going to a case and it's just inconclusive results, and the DNA is not really a big thing in the case, then, we may choose not to do the PowerPoint. Because, if the jurors sits and listens and learns all about DNA only to find out, well, no profile was obtained, then, it kind of feels like a waste of time, but if the DNA is really important in the case, then I'll go into more description about what exactly I'm doing in my testing and maybe using the PowerPoint to help explain it to them.

LR: Do you tend to try to then get that PowerPoint sequenced into your testimony so that it precedes your presentation of a DNA profile, or of results that were found?

TF: Yes. I always do it that way. It always starts with just going through my experience, education, and all that just so they understand I'm an expert witness, and then going into explaining DNA and how I develop a DNA profile, and going step-by-step into how I do that using the PowerPoint, um, and then, once I've done that, and then, going into my results for that case.

LR: Okay. Okay. Good. Um, that response actually brings us to question number two. So, short tandem repeat is one methodology that you are describing in court. As we see, the question asks—and, to a degree you've already answered this, but—what are some of the things you do to address challenges related to describing the methodology itself. Another way to ask the question is, in your experience as an expert witness, do you think that explaining the methodology you use is a challenge built into being an expert witness?

(6:07)

TF: I do. I think that's one of the biggest challenges built into being an expert witness is to try to explain to jurors who have a variety of educational backgrounds the technology that you're using because, I think, if they have a better understanding of it, then, they will trust your results more or understand your results more. But it there's that challenge of you wanting to explain more of what you're doing, but wanting to keep it in simple terms, not to use “allele” or “loci” or some of the—try to use everyday terms that they might speak as you would generally speak, not in a scientific, like using scientific texts to try to explain things that are scientific, basically.

LR: Um, I have a follow up question to that resposne. Uh, as you know, in many cases, including homicide cases, the jury is asked to reach a verdict according to the concept of

reasonable doubt. They need to be convinced beyond a reasonable doubt of the verdict that they...they issue. So, that's a legal standard of certainty. Uh, explaining the methodology, it seems to me, requires the expert witness to help the jury share your confidence in the method that you're using. Does that seem a fair description?

TF: Yes, it does.

(7:39)

LR: Now, reasonable doubt, is not a concept that's built into...it's not a part of the scientific method. Am I right? In that, most scientific journals that I've seen express certainty as a matter of probability.

TF: Yes.

LR: Do those differing standards of certainty—does thinking of those differing standards of certainty help you talk about the challenge you mentioned earlier of explaining your methodology to the jury?

TF: Can you say all that again? (Laughs.)

LR: Sure. I've made it a very complicated follow up question. There are legal standards about certainty (reasonable doubt, beyond the shadow of a doubt, but that's not usually the burden for homicide cases) and then science has its own way of expressing certainty.

TF: Yes.

LR: Probabilities, assurance indicators. Do those scientific and legal standards of certainty—those descriptions of what it means to be certain and how you get there—does the fact that there are those two standards, does that add to the challenge of being an expert witness.

(9:00)

TF: Um, I think, well, I think when I approach being an expert witness, my goal is to get the information to the jurors about what I have tested, and to make it clearer to them. So, whether it supports the conviction or doesn't support the conviction, I don't really worry about..I don't care about. Um, I do think one of the biggest challenges during expert testimony is showing the, kind of strength of the match. About, if you say something matches an individual, well, what does that mean? Does it mean that it came from that individual? I may not mean that it came from that individual. So, trying to clearly portray that, you know, even though I'm using this “match” term, that may not mean, um, then, you have to look at the rarity of that profile in that population. And, really trying to explain the statistics is the hardest—one of the harder parts of my testimony is trying to explain what do the statistics mean. And, so, how they can take those statistics and use them to help support whether that individual is in that sample or not.

LR: Great. Can you say more about those statistics? Are those the statistics related to the actual STR testing?

TF: They are. And, what they do, they um, they look at, so, if I say a profile matches to an individual, okay, well, who else could that profile match to? So then, I have to do statistics to

show how rare that profile is in the population. So, maybe one in four billion Caucasians or one in five billion African Americans, and so we look at three ethnic groups which are the common ones in Marion County. Um, one thing I notice prosecutors tend to do is they focus on well, the client is African American, so we're just going to look at the African American statistics, which you can't do that, because, you're looking at how rare the profile is in the population, so you also do want to look at the other ethnic groups to see, how rare is it Caucasians, how rare is it in Hispanics, because you're not making about the ethnicity of that profile. You know their ethnicity of the suspect, but you're just looking at the rarity of the profile.

LR: So, as a scientist, you have a methodology; that methodology requires considering population in a certain way. The prosecutor, probably for rhetorical and legal reasons wants to narrow the pool in a way that would interrupt or even undermine the scientific methodology which you want to keep...keep as is.

(11:32)

TF: Right. Exactly. Yeah. And I do see that a lot. And, sometimes you'll have, the prosecutor will try to kind of restate what your stating, cause, I think they're trying to make is simpler for the jury, but in restating it, they're restating it inaccurately to make it an incorrect statement. So then, I have to try go back and correct it in my response. Which, tends to happen a lot in statistics.

LR: That leads us exactly into the third question. Uh, which, which addresses how the experience of testifying in court is like or different from the experience of speaking with other colleagues in your field about the same kind of science. You've in fact mentioned what sounds

to me like one of the things build into question three, which is that in the courtroom, you have to respond, even in direct examination, your response has to be in some way a direct response to only the question that was asked . That sounds like that's just one of the challenges of bringing science into the courtroom—that question/answer format.

TF: It is, yeah. You do kind of have to keep, I mean sometimes I try to add in more information, but I can only respond to the question asked to me. So, there are times when um, I may think, it would be important for the prosecutor, or maybe even for the defense to ask me that question, but I can't, you know, come out with question. I have to wait for them to ask me that. I do have a pretrial with prosecutors on every case I go to court on to go over important things, and they do ask me “What should I be asking you?” so, I do get that, but I don't meet with the defense, I'm only meeting with the prosecutor. And, so, um, yeah, there are times when I there is more important for the jury—that may would be important for the jury to know that, I'm just not getting those questions.

LR: And, if it's something the prosecutor...if it wasn't on the list of things discussed at pretrial, the lawyer might not foresee how important that science is even to the legal point at hand, it sounds like.

TF: Yes, yes.

LR: Great. Fascinating. How else is talking about science as a witness similar or different from talking about it in any other part of the scientific community. So, journals, conferences, even, even casual conversations, but with people in your field?

(14:15)

TF: Right. Well, in my field, of course, you can use all the terminology and everything because they know what you are referring to. And, they have that background understanding, where, with jurors, you really have to, it really is like simplifying it, and maybe going into more explanation about things I wouldn't need to explain to my coworkers. Um, so, I mean that's the biggest challenge. Cause, I mean really, a lot of times, too, I'm usually the last one going on, and jurors have been sitting there all day, and I have to make sure they understand, and I have to keep their interest. I have to make it interesting for them so that I keep their attention.

LR: Whereas, you can assume that [interest] with the colleague...

TF: With the colleague...

TF: (Laughs) Yeah, they're interested, and the jury's...well, they may be tired and they may not have that interest in what I have to say. So, I have to keep in simple enough, because if I talk over their head, they're just gonna zone out, and they're not going to be listening to what I'm saying to them.

LR: Um, good. I uh, have a follow-up question to question number two, but I think it pertains to question three as well. I would essentially phrase the question like this: Are there ever times when you feel like part of the challenge you're facing is that the science you're explaining is sound, but it might seem counter-intuitive to someone not familiar with it? I'll give you an example I encountered in a transcript...it might have been your testimony. If not, it was someone testifying about DNA. It was this: Um, the uh, during cross examination, a defense

lawyer asked a witness who was describing DNA testing um, something like: “Fifteen regions are typically tested in most STR tests, is that right?” And, I think the witness said “Yes.” And then, either the defense lawyer or the witness added, “But, the more recent tests, we’re beginning to test 21 regions in STR testing.” It was something like that. My sense as a non-scientist is to think, “What was wrong with the fifteen tests that now twenty-one tests are needed?” Um, so that, uh, do you ever wonder, if, or, do you ever think that part of your challenge is sometimes what makes sense scientifically sounds doesn't make common sense to someone who doesn't know the science?

(16:56)

TF: Yeah, so they don't have all the information that I have, and so, yeah, I do see what you're saying. I do see what you're saying. So, fifteen may not seem like enough if you're now doing twenty one, but then I of course know that you're just increasing your statistics, so if your statistics are good, then, fifteen is sufficient, where they may look at that and see that, oh, maybe you should be doing more. So, that is a challenge when you are testifying. Yeah. So, it's you're always trying to think through what you're saying, and how they're going to interpret it, and if you're giving enough information with what you're saying to not make them leap to the wrong conclusion about what you're saying.

LR: So, it sounds like you're saying, an addition challenge that is woven into all of this, is, when do I add information, and how much?

TF: Exactly. It is. That is definitely a big challenge. Of you know, when do add information, and how much you should be adding.

(17:54)

LR: Excellent. Excellent. Well, you know, we have ten minutes left, and it just so happens that we are going through our questions at a pace that has us on track to finish right on time.

TF: Okay

LR: Which is fantastic. What I want to do at this point is look at the last two questions together. In many cases your answers have touched on these already. Especially, as you were just describing the challenges to know when to add information. That just seems like that ties into question number five. If time were unlimited, what else might be possible? Um, so year, I'll just read those questions: What other challenges have you faced that we've not touched on yet, and along with that, to what extent does time—you mentioned you are often testifying even at a late point in the trial's overall development—I also get the sense that, um, often, when an expert witness is first brought to the stand, the first direct ex might last twenty minutes, twenty-five minutes, some where in that area

TF: Uh-huh.

LR: I'm sure there are good reasons why that's about right, but, what other challenges have you faced? If time could somehow be suspended, and you could enroll the jury in a course--

TF: (Laughs)

LR: What would you do?

TF: Oh, yeah, I definitely think if they had just some background about biology and DNA that would be helpful. And, I think too, a lot of times, they are—the prosecutors are trying to keep on schedule—and so I think jurors have a LOT of information thrown at them in a very short amount of time. And, you're going, “This table matches this one, and this table matches this one,” and so, they're trying to write this information down because it's just coming at them so much that if you could go through, you know, “This piece of evidence, look at it, visually see it...I think maybe more visual things during testimony is helpful, because, you know, some people do tend to you know, understand things visually. I had one prosecutor do something I thought—in my opinion—worked really well. He actually did a PowerPoint, he, you know, put a picture up of the evidence item...a T-shirt. And he pointed to this stain, “Okay this one. Who did this match to?” So, you know, he went through each one. So, they were visually seeing what I'm telling them. And, I thought that was really helpful, because it was a lot of evidence items in a case. Normally, you're just kind of spouting out item numbers and what you're results were on them. So, I think for juries to keep track of, like, who was on what item, and what your results were for each item can be challenging as well.

(20:45)

LR: I have a follow up question on that very thing. This business of numbering of item relates in part to chain of custody, am I right, that it's very important that every item be labeled, that its place and who came in contact with it can be accounted for?

TF: Yes, yes it is.

LR: And, so, that's part of why a case that has a lot of evidence can end up with seventy...a hundred evidentiary samples for things that crime lab helped...

TF: ...create, yes. And then, any time like a sample is taken from an item, then it gets sub-itemized. So then, you get a lot of sub-itemizing, too. So, and that's just to relate it back to that parent item, but it can be a challenge in court when you have, you know, thirty-six point one, point one, point one, and they're trying to keep track of what that item is. So, I think it might be helpful, instead of using more descriptions of items instead of item numbers would be helpful for juries.

(21:49)

LR: Good, good. Great. Anything else?

TF: Uh, those are really the main things I can think of. I mean, too, the importance of—I know some of your stuff is about trustworthiness, and I think it really comes down to showing—I mean you really have show that you not their for either the prosecution or the defense, but to answer both of them clearly. And, sometimes your testimony may support the defense, and sometimes, that's okay. That's appropriate if it does. And, to be completely open with both the prosecution and the defense shows that you're trustworthy.

LR: So, being trustworthy to the jury is a matter of showing that your commitment is to your science.

TF: Exactly.

LR: Not to one or the other.

TF: Yeah. My commitment is to science and to the jury. I feel like am going there for the jury, just to explain to them my results.

LR: Uh, that does bring one more follow up question to mind. I see in a few instances cases where the jury exercised its right to write a question to be given to the judge, and then have the judge ask the witness. Do you feel like---do any particular moments from your experience as an expert witness come to mind from instances where the jury has asked questions of you?

TF: Yeah, I do. They ask questions a lot. In Marion County, they're allowed to do that. And, a lot of times they have good questions. Sometimes, these are questions that the prosecution or defense didn't ask, well the jury might ask it. The downside of jury questions is sometimes you really want clarification of what they're really asking, but, you know, you can't ask for clarification.

LR: You have to answer it as it was written and passed...

TF: Yeah. Which, makes it a big challenge. Because, sometimes, you'll answer it, and then you'll leave and think, "Was that really what they were asking, or were they asking this?" And, so, the lack of, kind of, being able to get clarification from the jury when they're asking questions is a challenge in itself.

(24:08)

LR: Good. Good. Well, we're almost done. I'll just leave it as an open mic to ask is there anything else you'd like to say, ask about, or anything at all.

TF: Nothing I can think of.

LR: Well, thank you very much for your time, it's been exceedingly helpful.

TF: Oh, good.

LR: Feel free to contact me if you have any questions about how the study is going, or anything like that, and again, thank you very much.

TF: You're welcome. Thank you.

END.

VITA

VITA

LUKE REDINGTON**EDUCATION**

Doctor of Philosophy in English Focus: Rhetoric and Composition **May 2016**

Purdue University, West Lafayette, IN GPA: 4.0/4.0

Dissertation: *Methodology on Trial: The Rhetorical Function of Toulminian Warrants in Expert Testimony*

Committee: Patricia Sullivan (chair), Thomas Rickert, Jennifer Bay, and Mark Hannah

Master of Arts in English Focus: Rhetoric and Composition **May 2009**

Kansas State University, Manhattan, KS GPA: 4.0/4.0

Bachelor of Arts in English Focus: Creative Writing **May 2002**

Kansas State University, Manhattan, KS GPA: 4.0/4.0

PEER-REVIEWED PUBLICATIONS

“Fighting Styles: An Application of Contemporary Rhetorical Theory to the Persuasive Prose of Mary Wollstonecraft and Mary Hays” Star Medzerian and Michael Duncan, Eds. In *The Centrality of Style*. Parlor Press, 2013.

“Methodology on Trial: The Rhetorical Function of Toulminian Warrants in Expert Testimony” *The Journal of Technical Writing and Communication*. (Forthcoming)

PEER-REVIEWED CONFERENCE PRESENTATIONS

Conference on College Composition and Communication Tampa, FL

March 2015

Presentation Title: “Risk is a Feeling, Not Just a Statistic: Pathocentric Probability in George Campbell's *Philosophy of Rhetoric*”

Conference on College Composition and Communication Indianapolis, IN

March 2014

Presentation Title: “Stephen Toulmin as an Open Source: Reconsidering Our Field's Appropriation of the Theory of the Warrant”

Conference on College Composition and Communication Louisville, KY

March 2010

Presentation Title: “Updating McGee’s Theory of the Ideograph: Insights from Sociolinguistics”

Conference on College Composition and Communication San Francisco, CA

March 2009

Presentation Title: “The Hermeneutical Value of Carolyn R. Miller’s Genre Theory”

TECHNICAL WRITING EXPERIENCE

The Center for Science of Information

February 2014 to Present

Purdue University, West Lafayette, IN

- Edited and co-wrote a comprehensive annual report which was central to earning a 25 million dollar grant from the National Science Foundation
- Wrote a wide variety of documents from white papers to literary journalism to explain and promote Center activities
- Strategized with Center management about innovations in communicating to a variety of public and governmental audiences about the significance of highly theoretical scientific concepts

Area IV Agency on Aging and Community Action Programs Needs Assessment

Lafayette, IN

January to May 2013

- Collaboratively designed and implemented a study to determine optimal distribution of human and financial resources
- Performed a mixed methods analysis which produced actionable results
- Presented the research results to both academic and civic audiences

OTHER PUBLICATIONS

“Charting a Course into the Science of Information.” www.soihub.org. May 2015.

“Scale is Everything: An Interview with Peter Shor.” www.soihub.org. March 2015.

“The Sequence of Things to Come: An Interview with Wojciech Szpankowski about the Future of Information Science.” www.soihub.org. October 2014.

ADMINISTRATIVE EXPERIENCE

Dean of College of Arts and Sciences Search Committee October 2008 to May 2009

Kansas State University, Manhattan, KS

I was the sole representative for a constituency of over 3000 graduate students on a committee responsible for filling one of the most important administrative posts at this large, science-oriented, R1 institution. As a fully vested committee member, I participated in all phases of this job search process.

University Life Café Project February to January 2008

Kansas State University, Manhattan, KS

This multidisciplinary effort resulted from a federal grant enabling the expansion of marketing strategies to promote the use of on-campus mental health resources. Recruited to create the textual component of these marketing strategies, I designed an advertisement campaign geared toward undergraduates. Then, I collaborated with visual artists and entrepreneurs on campus and in the surrounding community to implement the campaign. I later accepted a position as an executive board member.

UNIVERSITY SERVICE

Volunteer Research Assistant, ICaP Assessment Project October 2014 to June 2015

- Led focus groups and developed surveys to assess the effectiveness of composition pedagogy and curriculum

- Helped train graduate students in holistic scoring methodologies
- Recruited participants and helped with publicity efforts

Member, Purdue Writing Lab Safety Committee

February to May 2014

- Coordinated efforts with building deputies and directors to coordinate our safety plan across campus
- Interviewed university staff and personal about safety procedures
- Recommended changes and amendments for an updated Writing Lab safety manual

First Year Seminar Pilot Study

Aug. 2008 to May 2009

Research Assistant, Kansas State University, Manhattan, KS

- Developed methodology for measuring correlations between class size and critical thinking outcomes
- Coordinated collaborative research among multiple academic disciplines
- Conducted original research on discipline-specific pedagogical effectiveness in a large university setting

TEACHING EXPERIENCE

Graduate Teaching Assistant

August 2011 to Present

Purdue University, Lafayette, IN

Courses Taught

Technical Writing (English 421) Prepares advanced undergraduates in STEM fields to utilize a wide variety of current writing technologies to communicate effectively in technology-oriented workplaces. My particular curricular focus addresses the rhetorical opportunities and challenges inherent in advanced undergraduates' status as emerging experts.

1 section of 22 students

Introductory Composition (English 106) This national award-winning composition program orients students to the history of rhetoric, introduces a wide variety of writing skills, and promotes the use of technology in writing.

5 sections of 20 students

Tutor, Purdue Writing Lab

August 2013 to May 2014

Purdue University, West Lafayette, IN

- Tutored hundreds of students at one of the nation's largest and most research-intensive university writing centers
- Worked with many science and research oriented documents
- Developed tutor training materials

Instructor/Graduate Teaching Assistant August 2002 to December 2002, August 2007 to May 2011

Kansas State University, Manhattan, KS

Courses Taught

Expository Writing 1 (English 100) Introduces a variety of essay styles including memos, academic reports, and creative non-fiction. Students practice research methods and principles of academic discourse.

6 sections of 22 students

Expository Writing 2 (English 200) Introduces basic rhetorical theory and its application in written civic and academic discourse. Because this class is required of all students, it must meet several university-wide learning outcomes. Toward this end, I adapted Stephen Toulmin's rhetorical theories and incorporated them into my process-based pedagogies.

7 sections of 22 students

Introduction to Literature for Non-Majors (English 251) Orients students to all major literary genres and meets university-wide learning outcomes related to critical thinking. I emphasized historical context and the different social roles literature has played in Western culture.

2 sections of 30 students

Great Books (English 287) Provides an overview of world literature. My reading selections focused on reading a canonical work and then an adaptation thereof, such as *Beowulf* and *Grendel* by John Gardner.

1 section of 30 students.

Science Fiction Novels in *Lost* (English 295) Analyzes a selection of particularly influential science fiction novels whose popularity surged as a result of ABC's TV drama *Lost*. I designed, marketed, and taught this class for a summer intersession semester.

1 section of 8 students

Writing about Culture (English 300) Encourages students to use essay writing as a means of exploring and participating in culture. I was granted wide latitude in designing this elective course and chose to emphasize the role of creative writing techniques in a variety of rhetorical situations.

2 sections of 22 students

Creative Non-Fiction Writing Workshop (ENGL 465). Fosters the development of both creative writing and analytical criticism through a student-centered workshop environment. Students also engage theoretical questions such as the social role of creative nonfiction.

1 section of 20 students

AWARDS

| | |
|---|-------------|
| Quintilian Award for Excellence in Teaching | 2012 |
| First Place, Graduate Creative Writing Competition Nonfiction category | 2009 |
| Honorable Mention, AWP Intro Journals Project Nonfiction category | 2009 |
| Second Place, Graduate Creative Writing Competition Poetry category | 2008 |

| | | |
|---|--|-------------|
| Nominee, Jerome Joahnning Memorial Scholarship | Best GTA in cohort | 2008 |
| Lamb Foundation Memorial Scholarship | Excellence in creative writing | 2002 |
| Honors Essay Scholarship Competition | Second place for critical essay | 2001 |
| Hallam Walker Davis Award | Excellent performance in English studies | 2001 |
| College of Arts and Sciences Excellence Award | Sustained high achievement | 2001 |
| Patty Johnson Foundation Scholarship | Distinction in academics and service | 2000 |