

EXAMINING THE EFFECTS OF THE *DAUBERT* TRILOGY ON EXPERT EVIDENCE PRACTICES IN FEDERAL CIVIL COURT: AN EMPIRICAL ANALYSIS[†]

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INTRODUCTION

The use of scientific and technical evidence has undoubtedly risen to play an important role in contemporary American courts. A variety of issues have paralleled this development, not the least of which relates to the admissibility of technical and other scientific evidence.¹ Changes in expert testimony

[†] This research project was funded by a research grant from the Project on Scientific Knowledge and Public Policy, School of Public Health, George Washington University. The authors are grateful for this support. A version of this research was presented at the 2009 Meetings of the Law and Society Association, Denver, CO, May 29, 2009.

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1. See generally initial debate regarding the effects changes would have on admissibility standards. Bert Black, Francisco J. Ayala, & Carol Saffran-Brinks, *Science and the Law in the Wake of Daubert: A New Search for Scientific Knowledge*, 72 TEX. L. REV. 715 (1994) (arguing that admissibility rates would decrease, as “junk science” would be increasingly excluded under the new standards); David L. Faigman, Elise Porter, & Michael J. Saks, *Check Your Crystal Ball at the Courthouse Door, Please: Exploring the Past, Understanding the Present, and Worrying about the Future of Scientific Evidence*, 15 CARDOZO L. REV. 1799 (1994) (positing the effect on admissibility decisions would depend upon the type of expert evidence proffered); Richard D. Friedman, *The Death and Transfiguration of Frye*, 34 JURIMETRICS J. 133 (1994) (suggesting the new standards would have little impact on admissibility); Another example of an issue that sparked deliberation pertained to judges’ ability to act in their gatekeeping role. See generally David L. Faigman, *Mapping the Labyrinth of Scientific Evidence*, 46 HASTINGS L.J. 555 (1995) (arguing judges may experience difficulty applying the new standards due to their lack of knowledge related to scientific theory methodology); Merlyn W. Clark, *The Impact of Daubert on the Admissibility of Expert Opinion*, 39 ADVOC. 10 (1996) (arguing that judges are capable of acting competently in their newly designated capacity as gatekeepers).

admissibility standards, most notably those related to the *Daubert* trilogy,² have sparked intense interest and debate in the legal and research community, and have made it an important field of study.³ This paper presents the quantitative results of a systematic study conducted on the effects of *Daubert* and its progeny on expert evidence practices in federal civil court.

The first section of this article sets the background for the present program of research, discussing the legal history of expert evidence admissibility standards in American federal courts, reviewing previous research in the area, and outlining the current research project. The second section reviews the methodology employed, and the third presents the empirical results of analysis of coded federal civil court case files drawn from pre- and post-*Daubert* time periods. The fourth and final section reviews the research project and findings, placing them within the context of contemporary expert evidence standards and practices and relating them to existing research in the area.

I. BACKGROUND

A. Legal History of Expert Evidence Admissibility Standards

The predominant standard for evaluating expert testimony in federal courts for seven decades was developed in *Frye v. United States*.⁴ In establishing what would commonly be referred to as the “*Frye* test,” or “general acceptance” rule, the Court stated that in order for scientific evidence to be admissible, the underlying method “from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.”⁵

In 1976, the Federal Rules of Evidence (FRE) were adopted. Rule 702 of the FRE stated “[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto to the form of an opinion or otherwise.”⁶ While the adoption of FRE did not specifically preclude the use of the general

2. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999); *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997); *Daubert v. Merrell Dow Pharm.*, 509 U.S. 579 (1993).

3. See sources cited *supra* note 1.

4. *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

5. *Id.* at 1014.

6. FED. R. EVID. 702; see also CHRISTOPHER B. MUELLER & LAIRD C. KIRKPATRICK, FEDERAL RULES OF EVIDENCE, WITH ADVISORY COMMITTEE NOTES, LEGISLATIVE HISTORY, AND CASES 19 (2005 ed.).

acceptance rule in the evaluation of expert testimony, questions arose about the continued applicability of *Frye*.⁷ Criticisms of the *Frye* standard varied and included critiques related to both the perceived conservative and overly permissible nature of the general acceptance approach to admissibility.⁸ That is, critiques pertaining to the conservative nature of *Frye* argued that under the rule it was possible for a novel, though scientifically-sound, form of evidence to be excluded if it had yet to reach a threshold of general acceptance.⁹ Alternatively, criticisms that *Frye* was too lax were based on the premises that the general acceptance standard resulted in deference to experts in fields that lack a tradition of rigorous scrutiny.¹⁰

In 1993, the United States Supreme Court issued the first decision in a line of three cases, collectively referred to as the “*Daubert* trilogy,” that would fundamentally alter the dynamic of expert evidence admissibility in federal courts, as well as in state courts adhering to federal rules of evidence.¹¹ This new rule supplanted the “general acceptance” rule derived from *Frye*.¹² In the *Daubert* decision, the Court provided an interpretation of Rule 702 that established a new standard for the admissibility of expert evidence. *Daubert* stated that in order for evidence to be admissible, it must be relevant, assisting “the trier of fact to understand the evidence or to determine a fact in the issue,”¹³ and must meet a standard of “evidentiary reliability.”¹⁴ In determining whether evidence met the reliability requirement, the Court asserted that judges should perform a “preliminary assessment of whether that reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in the issue.”¹⁵ The Court acknowledged that this determination would involve many factors, thus explicitly refusing to delineate a specific checklist. It did, however, outline four non-exclusive factors for judges to consider. These included: (1) whether the theory is “falsifiable” and has been tested; (2) whether the theory or technique had been subject to peer review and publication; (3) the known or potential error rate; and (4) whether it had gained

7. For a discussion of these criticisms, see Joseph Sanders et al., *Legal Perceptions of Science and Expert Knowledge*, 8 PSYCHOL. PUB. POL’Y. & L. 139, 140 n. 6 (2002).

8. DAVID L. FAIGMAN ET AL., MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY 13 (2d ed. 2001).

9. *Id.*

10. *Id.*

11. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999); *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997); *Daubert v. Merrell Dow Pharm.*, 509 U.S. 579 (1993).

12. *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

13. *Daubert*, 509 U.S. at 591.

14. *Id.* at 590.

15. *Id.* at 592–93.

general acceptance by the relevant community.¹⁶ *Daubert* effectively placed judges in a “gatekeeper” position, necessitating a more active role than under *Frye* and charging them with the responsibility for evaluating the scientific validity of the basis for expert testimony.¹⁷

The two following decisions in the *Daubert* trilogy further defined the contours of the new doctrine. In *General Electric Co. v. Joiner*, the Court clarified the standard for appellate review of admissibility decisions, assigning more power to trial court judges in making admissibility determinations by adopting an “abuse of discretion” standard for review of admissibility decisions.¹⁸ The decision also authorized all judges to evaluate the conclusions arrived at from scientific research and then presented in court, which marked something of a departure from *Daubert*, where the focus was on methods only.¹⁹ *Kumho Tire Co. v. Carmichael* served to elucidate the reach of judges’ gatekeeping role, asserting that it applied not only to expert testimony based on scientific knowledge, but also to that based on technical or other specialized knowledge.²⁰

B. Previous Research

While *Daubert* and its progeny inspired an abundance of literature in the legal community,²¹ only a small proportion of this work represents systematic research directly examining the effects of the changes in admissibility standards.²² Existing research has primarily utilized two methodologies,

16. *Id.*

17. *Id.* at 592.

18. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 140 (1997).

19. *Id.* at 146 (“[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence which is connected to existing data only by the *ipse dixit* of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered. That is what the District Court did here and we hold that it did not abuse its discretion in so doing.” (citations omitted)).

20. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 144 (1999).

21. *See* sources cited *supra* note 1.

22. Research-based literature examining the effects of *Daubert* and its progeny include: NICOLE L. WATERS & JESSICA P. HODGE, THE EFFECTS OF THE DAUBERT TRILOGY IN DELAWARE SUPERIOR COURT (2005); Veronica B. Dahir et al., *Judicial Application of Daubert to Psychological Syndrome and Profile Evidence*, 11 PSYCHOL. PUB. POL’Y. & L. 62 (2005); Lloyd Dixon & Brian Gill, *Changes in the Standards for Admitting Expert Evidence in Federal Civil Cases Since the Daubert Decision*, 8 PSYCHOL. PUB. POL’Y. & L. 251 (2002); Shirley A. Dobbin et al, *Federal and State Trial Judges on the Proffer and Presentation of Expert Evidence*, 28 JUST. SYS. J. 1 (2007); Sophia I. Gatowski et al., *Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a Post-Daubert World*, 25 LAW & HUM. BEHAV. 433 (2001); Jennifer L. Groscup et al., *The Effects of Daubert on the Admissibility of Expert Testimony in State and Federal Criminal Cases*, 8 PSYCHOL. PUB. POL’Y. & L. 339 (2002); Carol Krafska et al., *Judge and Attorney Experiences, Practices, and*

surveys of judges and attorneys and content analysis of court opinions, and has revealed a variety of effects of *Daubert* and its progeny on expert evidence practices.

Carol Krafska (of the Federal Judicial Center) and colleagues' research entailed an analysis of a series of three surveys crafted to examine changes in practices and beliefs concerning expert testimony following the change in evidentiary standards.²³ Two of the surveys were conducted with federal court judges, one administered prior to *Daubert* and one following the decision, and the other with attorneys six years after *Daubert*.²⁴ In general, their results suggest that *Daubert* influenced the practices of federal judges and attorneys in civil cases along a variety of dimensions, primarily with regard to increased scrutiny of expert evidence.²⁵ Attorneys reported greater involvement in their preparation of expert evidence, in particular by devoting greater attention to the credentials of their own experts, and also by filing more motions to challenge opposing experts.²⁶ Judges surveyed after *Daubert* reported they were more likely to scrutinize expert testimony before trial and were less likely to admit it than judges responding to a survey from the pre-*Daubert* time period.²⁷ Those federal judges surveyed prior to *Daubert* reported excluding or limiting challenged expert evidence in twenty-five percent of the cases, a figure that rose to forty-one percent in a survey conducted approximately a half decade following the decision.²⁸ However, this heightened scrutiny did not necessarily reflect an increased reliance on *Daubert*-related factors.²⁹ For example, the most frequent reasons cited for excluding expert evidence by judges surveyed after the *Daubert* sample were associated with traditional rules governing expert testimony (e.g., relevancy, qualifications, assist trier of fact), and were similar to the responses provided by judges in pre-*Daubert* surveys.³⁰

Sophia Gatowski and colleagues conducted a nationally representative survey with 400 state court judges in an effort to examine the judges'

Concerns Regarding Expert Testimony in Federal Civil Trials, 8 PSYCHOL. PUB. POL'Y. & L. 309 (2002); Mara L. Merlino, Colleen I. Murray, & James T. Richardson, *Gatekeeping and the Social Construction of the Admissibility of Expert Testimony*, 26 BEHAV. SCI. & L. 187 (2008); and D. Michael Risinger, *Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?*, 64 ALB. L. REV. 99 (2000).

23. Krafska et al., *supra* note 22, at 309.

24. *Id.*

25. *Id.*

26. *Id.* at 329.

27. *Id.* at 322.

28. *Id.*

29. *Id.*

30. *Id.*

understanding and application of the *Daubert* guidelines, as well as their general perceptions of the *Daubert* criteria and its relevancy to their gatekeeping role and admissibility decisions.³¹ Gatowski's analysis revealed that judges supported the gatekeeping function outlined in the *Daubert* decision, and that many regarded the guiding criteria as providing valuable decision-making framework.³² Despite this perceived merit, results also revealed that judges had difficulty operationalizing and applying the *Daubert* criteria, particularly with respect to concepts of falsifiability and error rate.³³

In a follow-up report, Shirley Dobbin and colleagues compared data from interviews with federal and state court judges to examine ways in which the proffer and presentation of expert evidence was being dealt with by judges following *Daubert*.³⁴ Their analysis revealed many commonalities in the experiences of both groups, as they encountered similar types of expertise, were presented with admissibility issues at similar points in the litigation process, and described comparable problems with proffered evidence (e.g., extensive disagreements among experts, questionable objectivity of experts).³⁵

An additional line of published research has relied on content analysis of court opinions to examine the effects of the *Daubert* trilogy. Jennifer Groscup and colleagues analyzed state and federal appellate court opinions concerning expert testimony in criminal cases.³⁶ Utilizing the Westlaw database, they drew a sample of 693 cases from a time frame spanning from 1987 to 1998. While they found no statistically significant differences in admissibility rates following *Daubert*,³⁷ their analyses revealed a variety of other notable

31. Gatowski et al., *supra* note 22, at 433.

32. *Id.*

33. *Id.* at 444–45.

34. Dobbin et al., *supra* note 22, at 1.

35. *Id.* at 4–12.

36. Groscup et al., *supra* note 22, at 339.

37. This lack of significant difference with respect to changes in admissibility rates in the realm of criminal cases represents something of a departure from what was found in research utilizing civil case samples. See, for example, the results of Dixon & Gill, *supra* note 22, at 293 (Roughly fifty percent of challenged expert evidence was excluded in their pre-*Daubert* sample, which increased to as much as seventy percent in samples from the years following *Daubert*); Krafka et al., *supra* note 22, at 322 (Those federal judges surveyed prior to *Daubert* reported excluding or limiting challenged expert evidence in twenty-five percent of the cases, a figure that rose to forty-one percent in a survey conducted approximately a half decade following the decision). While research has yet to address the underlying cause of these differences, several possible interpretations have been offered. See Michael J. Saks & David L. Faigman, *Expert Evidence After Daubert*, 1 ANNU. REV. L. SOC. SCI. 105, 122 (2005) (“One possible explanation for the differences between civil and criminal cases is that there are meaningful differences in the quality of the science being offered in the different groups of cases and that there are systematic differences between the factual issues that arise in civil and criminal cases. Or, perhaps, the differential outcomes are attributable to differences in the quality of advocacy (borne of differences in resources) in the two realms. However, some commentators

effects.³⁸ Generally, in the period following *Daubert*, reliance on *Frye* diminished while challenges increasingly drew upon the new criteria, though this emphasis differed depending on the type of expert testimony proffered.³⁹ Overall, however, the standards related to the Federal Rules of Evidence emerged as the criteria that were most reliably related to decisions to admit or exclude challenged expert evidence.⁴⁰

The work of Lloyd Dixon and Brian Gill utilized a sample of federal civil district court opinions with challenges to experts between 1980 and 1999.⁴¹ Their results revealed various dimensions of *Daubert*'s impact on expert evidence practices.⁴² More specifically, following the decision, standards of admitting evidence were found to have tightened, as judges were more likely to evaluate the reliability of expert testimony.⁴³ While the hard sciences initially were of predominant focus, judges progressively began to examine other domains of evidence as well.⁴⁴ Their analysis also revealed that initially judges seemed to commonly address all of the *Daubert* factors in their reliability assessments, though with the passage of time the underlying theory, methods, and procedures of the proffered expert testimony emerged as dimensions emphasized in evaluations.⁴⁵

Professor Michael Risinger's analysis of expert evidence admissibility targeted both civil and criminal cases, and utilized both district court and appellate cases.⁴⁶ The federal civil component of his analysis utilized a sample of 287 appellate and 584 federal district court cases in which reference was made to the *Daubert* decision.⁴⁷ With respect to the appellate opinions in federal civil court, rather pronounced disparities emerged in relation to both the frequency of challenges raised by the respective litigant parties and to the success rates of those challenges.⁴⁸ More specifically, approximately 90% of the challenges were raised by civil defendants against plaintiff proffered expert evidence, and such challenges were successful approximately two-thirds of the

suggest that social and political differences easily explain the differential treatment: As a general proposition, judges disfavor civil plaintiffs and criminal defendants and are more likely to rule against them than against their opposites even when presenting equivalent evidence or arguments. A more definitive explanation of the pattern awaits future research.").

38. Groscup et al., *supra* note 22, at 345–63.

39. *Id.* at 354–56.

40. *Id.* at 359–63.

41. Dixon & Gill, *supra* note 22, at 251.

42. *Id.* at 269–97.

43. *Id.* at 270–74.

44. *Id.* at 278.

45. *Id.* at 283.

46. Risinger, *supra* note 22, at 99.

47. *Id.* at 108. These cases were identified by a Westlaw database search.

48. *Id.*

time.⁴⁹ Alternatively, in the comparatively small number of cases in which defense-proffered evidence was challenged, these challenges were successful roughly half the time.⁵⁰ Examination of his sample of cases from federal district court revealed similar success rates.⁵¹

While the existing body of larger-scale, published case content analyses provide valuable information with which to assess the impacts of *Daubert*, it is important to note that the data utilized in these analyses are derived exclusively from cases that proceeded to trial, and as a consequence, are characterized by a selection bias that limits their ability to speak directly to questions about the effects of *Daubert* in the larger body of cases that do not culminate in a trial.⁵² For example, the data utilized by Groscup et al. was drawn from appellate opinions in criminal cases.⁵³ Because appellate courts do not review all trial court decisions, and not all cases proceed to trial, the sample utilized for analysis was limited to a specific set of cases. While the approaches of Risinger⁵⁴ and Dixon and Gill,⁵⁵ both of which relied on district court opinions, yielded samples of cases which were perhaps more representative, they too share a few notable limitations affecting their ability to generalize the overall universe of cases with expert evidence. More specifically, both studies utilized Westlaw's database of federal district court opinions as a means to select cases for inclusion in their research, with Dixon and Gill sampling only opinions in which evidence had been challenged,⁵⁶ and Risinger drawing only cases in which explicit reference was made to *Daubert*.⁵⁷ Locating cases by means of Westlaw may result in certain exclusions because the database contains only written opinions, not oral rulings issued from the bench, and also due to the fact that some district court opinions are not reported to Westlaw. However, perhaps more importantly with respect to the ability to address questions about the broader impacts of *Daubert*, Dixon and Gill's sample does not provide information on cases in which expert evidence was utilized, but not disputed, and Risinger's sample excludes all cases in which there was no reference to *Daubert*.

49. *Id.*

50. *Id.*

51. *Id.* at 110.

52. See Risinger, *supra* note 22, at 102 n.15 (discussing the potential ability of a sample of cases drawn from the universe all cases having dealt with expertise, as opposed to solely those raising *Daubert* issues, to elucidate the larger scale impact of *Daubert*. "This is the set that would be likely to reveal the influence of *Daubert* most clearly.").

53. Groscup et al., *supra* note 22, at 342.

54. Risinger, *supra* note 22, at 102.

55. Dixon & Gill, *supra* note 22, at 262.

56. *Id.*

57. Risinger, *supra* note 22, at 102.

This relative neglect of a broader range of civil cases is primarily driven by practical obstacles that have constrained the ability of researchers to adequately collect the necessary data at the trial court level. For example, it can be difficult to reliably and efficiently identify information in cases that utilize expert evidence, but in which no challenge or *Daubert* issue is raised. Indicators pinpointing the presence of expert evidence often are not readily available in case dockets, and changes in filing practices and terminology over years further complicate attempts to devise a methodology to reliably identify and sample relevant cases.⁵⁸ In fact, the vague nature of the information available in dockets has led some researchers adopting the docket search approach to suggest that it may not be an effective methodology for larger-scale studies.⁵⁹ In addition to the difficulties of effectively identifying expert evidence, no methodology utilized in case content analysis research has established a reliable means of identifying when a *Daubert* motion is filed and when related hearings are held.⁶⁰ Further complicating matters is the myriad of practical difficulties that arise when attempting to locate, access, and code materials once the relevant cases have been identified. For example, older case files are often only available in their original hard copy format,⁶¹ many times located in off-site archives,⁶² and are commonly plagued by problems such as incomplete files and missing documents.⁶³ These difficulties contribute to the already considerable amount of time and resources necessary to locate and code relevant case files, making the research process even more substantial and costly. As a consequence, utilizing Westlaw database searches (as has been done in previous research) represents a pragmatic, manageable means of approaching case identification and sampling in large-scale studies.

These challenges have hindered the ability of researchers to efficiently and reliably identify, obtain, and code cases. This has prevented a broadening of the scope of inquiry to integrate cases into analysis that include expert evidence, but do not include challenge activity or proceed to trial. Nevertheless, integrating systematic study of this universe of cases into the existing body of research represents an important element in discerning the overall effects of *Daubert* on expert evidence practices in federal civil courts.

58. WATERS & HODGE, *supra* note 22, at 24.

59. *Id.*

60. *Id.* at 7.

61. As opposed to, for example, electronic versions of case dockets and filings that may be available for recent cases (which itself varies by state) on electronic record systems, such as Public Access to Court Electronic Records (PACER).

62. This may include off-site state holdings or storage at more remote facilities, such as regional archives.

63. *See, e.g.*, WATERS & HODGE, *supra* note 22, at 24.

The exploratory pilot research conducted by Waters and Hodge at the state trial court level in Delaware represents an initial foray into research attempting to broaden the scope of inquiry about the *Daubert* trilogy's effects.⁶⁴ They piloted an expanded methodological approach by integrating review of case files that involved expert evidence but did not proceed to trial, as opposed to solely focusing on appellate decisions or cases with challenges to expert evidence, and also by placing an increased emphasis on aspects of pre-trial activity.⁶⁵ While they encountered many of the difficulties referenced in the previous discussion that limited the depth of their analyses, based on their review of case files and interviews with judges and attorneys, Waters and Hodge asserted that the focus of future work would benefit by focusing on pre-trial and trial activity, as opposed to being limited to disposition outcomes and appellate decisions.⁶⁶

The following research was designed and conducted with the goal of addressing deficits in the existing body of research. To this end, we incorporated important considerations from the pilot work of Waters and Hodge into our overall methodological design. Aided by specific unique characteristics of the data available in South Carolina federal civil courts that allowed us to address particular difficulties commonly encountered in case file analyses, we were able to pursue novel and important initial research about the broader impacts of the *Daubert* trilogy in civil court.

C. The Current Research

Our research was intended to both complement and extend the existing body of systematic research and represents an initial step in the important direction of examining the broader effects of *Daubert* in federal civil court. Capitalizing on distinctive characteristics of the data available in the Federal District of South Carolina, we were able to bypass certain of the aforementioned obstacles and employ a more expansive sampling scheme. As a consequence, we were able to incorporate a wider sample of cases, a substantial proportion of which did not proceed to trial, in our analysis than had been utilized in previous research. In addition, taking into account the recommendations generated from the work of Nicole Waters and Jessica Hodge, we placed increased analytical emphasis on aspects of the litigation process related to pretrial activity in our overall research. By integrating these elements into our methodological design, our goal was to pursue research

64. WATERS & HODGE, *supra* note 22, at 1.

65. *Id.* at 8-13.

66. *Id.* at 24.

capable of contributing important information about the extent of the effects of *Daubert* and its progeny on expert evidence practices in federal civil court.

Unlike other federal district courts, local rules in place in South Carolina required extensive information to be filed with the Court about proposed experts who were going to be retained as witnesses in cases before the Court. Much of the information that was available as a result—including indicators of the proffer of expert evidence, *Daubert* motions, and related hearings—allowed us to effectively and successfully locate cases relevant to our research. Thus, the distinctive qualities of the data set available in federal court in South Carolina provided us with an unprecedented opportunity to bypass certain obstacles typically encountered in case file analyses, and to conduct research with this important, yet heretofore unexamined, range of cases.

The South Carolina data set, with its unique characteristics, was reputed to contain information necessary to make significant comparisons of the impact of *Daubert* and its progeny on how experts are used and dealt with in federal court. These comparisons were deemed to have the potential to yield answers to a variety of general questions that might help scholars and others understand better the broader impacts of *Daubert* and related cases. Such questions include: Has the new set of rules about the use of experts in court led to significant changes in how cases involving such testimony are dealt with? If so, what are those changes? Are those who think that *Daubert* and its progeny were part of an effort to effect reform in how civil cases are handled in our society correct, as indicated by an assumed greater tendency to dispose of cases through various trial procedures based on *Daubert* guidelines? If this is the case, exactly how are the new guidelines being implemented to accomplish this end? If such is not the case, what other effects of the new guidelines, intended or not, can be ascertained?

The exploratory work of Waters and Hodge in Delaware, a state that has adopted *Daubert*, has been one of the few studies to deal with the level of detail needed to begin to address some of the questions concerning the impact of *Daubert*.⁶⁷ This research offered insight into the processes for cases using expert testimony in state courts of Delaware, and highlighted important foci of emphasis for further research.⁶⁸ Our intention with this program of research in South Carolina was to further build upon that beginning within the federal court system, broadening the scope of cases studied and devoting greater analysis to certain important, though less studied, aspects of how expert evidence is dealt with in the litigation process. The current study represents one of the first opportunities to pursue this type of work in a federal setting,

67. WATERS & HODGE, *supra* note 22, at 8.

68. *Id.* at 24.

and to address some of the problems that Waters and Hodge's research uncovered in working with these types of data.

The South Carolina data set was examined for information that would provide a better understanding of the complexities of cases involving expert testimony in this district, and the broad impact of *Daubert* and its progeny on the handling of civil cases in our society. Information extracted from case files targeted aspects of expert evidence practices that pertained to both expert witnesses (e.g., what types of expertise were retained, whether more or fewer experts had been used following the decision, etc.) and variations in the overall process (e.g., frequency, timing, basis, and resolution of challenges). Specifically, information was compiled from expert reports filed with the court, motions concerning expert testimony being proffered, and the disposition of such motions, and various other general filings with relevant information.

Specific issues of interest that formed the basis for this research pertained to:

- Number of experts retained to testify at trial – helps answer questions of whether *Daubert* has led to fewer experts being proffered;
- Types of experts retained – speaks to the question about which areas of expertise have been most affected by *Daubert* in terms of the use of experts;
- Timing and outcome of challenges to proffered expert testimony – helps determine the timing of *Daubert*-based challenges, and if the pattern of challenges has changed since *Daubert*;
- Basis of challenges to expert evidence – helps examine any change in the grounds upon which challenges were based;
- Use of summary judgment related to expert testimony – helps determine if more cases have been dismissed through summary judgment after *Daubert*, or if cases involving certain areas of expertise survive summary judgment more frequently than others; and
- Extent of exclusion of expert testimony, and impact of such exclusions on case disposition – allows for a general review of whether *Daubert* has in fact led to more exclusions of expert testimony through one mechanism or another, and if so, to what effect.

II. METHODOLOGY

A. Case Sampling

1. *Post-Daubert period: 2005–2006*

A sampling frame comprised of case docket filings that identified expert evidence in civil cases during 2005 and 2006 was used to select cases.⁶⁹ Fifty cases from both years were randomly selected from the database. The Public Access to Court Electronic Records (PACER) electronic docketing system was utilized to access the case files and documents for purposes of coding.⁷⁰

2. *Pre-Daubert period: 1991–1992*

Specific docket entries labeled “ID of Experts” utilized in the post-*Daubert* sample were not available in pre-*Daubert* dockets.⁷¹ Instead of these separate filings, identification of experts in cases from the pre-*Daubert* period was contained within the Rule 26 filings, in accordance with the prevailing rule of the time.⁷² Based on preliminary research, it was estimated that approximately one-third of cases with Rule 26 filings contained experts. A random sample of 300 cases from the population of cases containing Rule 26 filings from January 1991 through December 1992 was selected for purposes of coding, with the goal of achieving a comparable number of cases to match

69. These docket entries were either drawn from filings labeled “ID of Experts” or from the Rule 26(f) reports. It should be acknowledged that these filings that enabled this approach to case identification, while a marked improvement over the limited information available in other districts, are not perfect indicators for the presence of expert evidence in cases for the years from which the post-*Daubert* sample was drawn. The majority of judges in the South Carolina district require filing of a document identifying the expert witnesses and certifying that required disclosures have been made in an effort to preclude disputes at trial as to whether disclosures were made. The rule requiring information on experts was not retained after 2000; however, most judges in the district still follow the long-standing practice of requiring considerable pre-trial information to be filed with the court. As a consequence, there still remains the possibility of false negatives within the overall sampling frame from which our case sample was drawn. This caveat notwithstanding, the nature of the data available did provide us with a manageable means with which to expand the scope of inquiry beyond the case sampling method employed in previous research, allowing us to conduct this initial research and make significant comparisons upon which further research may build.

70. Public Access to Court Electronic Records Overview, <http://pacer.psc.uscourts.gov/pacerdesc.html> (last visited Mar. 23, 2010).

71. *See supra* text accompanying note 69.

72. S.C. R. Civ. P. 26.03.

the post-*Daubert* sample.⁷³ The PACER docketing system did not have electronic versions of these filings for cases available online. Consequently, hard copies of the files for the pre-*Daubert* time period were coded on-site at the Southeast Regional Facility of the National Archives in Ellenwood, Georgia.⁷⁴

B. Coding

Coding was conducted by the authors and research assistants at the Grant Sawyer Center for Justice Studies.⁷⁵ The coding scheme⁷⁶ was adapted from the pilot work of Waters and Hodge.⁷⁷ Coding focused on specific information regarding expert evidence, such as the frequency and types of expertise proffered by each party in a case, any information on any exclusionary motions (i.e., grounds, case law cited, outcome), as well as more general information about the case and the litigating parties.⁷⁸

Our examination of the case files was tailored to build on the work of Waters and Hodge in a number of respects. First, we expanded the range of civil cases beyond the strict product liability focus of their pilot work to include a fuller range of civil cases. In addition, following their recommendation of placing an increased focus on pretrial and trial activities, we pursued an empirical examination of trends in several specific areas of civil expert evidence practices. These included specific aspects related to retention of experts, such as changes across the two time periods with regard to the

73. Changes in filing practices and terminology across pre- and post-*Daubert* time periods represent one substantial obstacle to attempts to conduct case file analysis, see WATERS & HODGE, *supra* note 22, at 24. Fortunately, the labeling of these specific filings represented the sole occasion during the current research when filing practices proved to be a potential impediment. By utilizing the Rule 26 filings and estimations derived from preliminary research, a sample comparable in size to the post-*Daubert* time period sample was achieved; thus, this change did not prove to be a major obstacle to the case file analysis.

74. Difficulties in accessing, along with the substantial time requirements necessary to successfully retrieve and code, older case files retained in off-site archives are challenges that have proved to be complications in previous research. See WATERS & HODGE, *supra* note 22, at 24. The staff at the Southeast Regional Archives provided substantial assistance to the authors during the authors' research efforts and their help was key to the completion of the coding.

75. All the assistants coding the cases had doctoral-level training in research methods, as well as specific training devoted to the legal history of admissibility standards, including *Daubert* and its progeny. All cases were coded and then check-coded by a different individual. Any discrepancies were resolved, following discussion with the respective coders, by one of the principal investigators.

76. For the full codebook, see David M. Flores, James T. Richardson, & Mara L. Merlino, Effects of *Daubert* on Expert Evidence Practices in Federal District Court of South Carolina 52 (May 31, 2008) (unpublished report, on file at the The Grant Sawyer Center for Justice Studies).

77. WATERS & HODGE, *supra* note 22, at B-1.

78. Flores, Richardson, & Merlino, *supra* note 76, at 52.

frequency and types of expertise retained. Moreover, we sought to delve beneath the surface of simple frequencies of admissibility challenges to expert evidence by examining systematic differences in not only the number of challenges, but also differences in the basis for such challenges. We also structured coding efforts in a manner that would allow us to explore potential issues related to the timing of both the retention of experts and the timing of challenges. By integrating an enhanced focus on pretrial activities into our overall investigation, our goal was to provide a broader and more detailed examination of expert evidence practices in the pre- and post-*Daubert* time periods.

III. RESULTS

A. Case Sample

The final case sample consisted of 191 cases, 100 from the time period spanning from January 1, 2005 to December 31, 2006 and 91 from the two years immediately preceding the year of the *Daubert* decision, beginning January 1, 1991 and running through December 31, 1992. All thirty nature-of-suit civil case classifications⁷⁹ and all districts within the state were represented in the sample.⁸⁰ Our final sample size in each of the years represented a marked increase above what was available to Waters and Hodge in their research conducted with civil case files from state courts in Delaware,⁸¹ and this increased sample size allowed for formal statistical analyses of a variety of specific points of interest.

B. Expert Evidence

1. *Changes in number of experts retained.*

A total of 792 experts were retained in the overall sample of 191 cases. The number of experts retained in individual cases for plaintiff parties ranged from zero to twenty-three, and the number retained for defendant parties from zero to forty. Table 1 displays the figures for the average number of experts

79. As classified in the PACER system. For full listing *see* Flores, Richardson, & Merlino, *supra* note 76, at 52.

80. There were isolated, though very small differences—none of which reached levels of statistical significance—in the number of cases from the respective nature-of-suit categories in the samples from the two time periods. However, these very slight differences did not equate to differential contributions of the particular types of cases to differences on the dependant variables.

81. WATERS & HODGE, *supra* note 22, at 9.

retained with respect to pre- and post- *Daubert* time periods and litigant party.⁸²

Table 1. Mean Number of Experts Retained Per Case

| <i>Party</i> | <i>Time Period</i> | | | |
|--------------|--------------------|-----------|-------------------|-----------|
| | <i>1991–1992</i> | | <i>2005–2006</i> | |
| | <i>Mean</i> | <i>SD</i> | <i>Mean</i> | <i>SD</i> |
| Defense | 0.92 ^a | 1.46 | 1.44 ^a | 1.91 |
| Plaintiff | 3.23 ^b | 2.76 | 2.14 ^c | 2.43 |

*Note: In both rows and columns, values not sharing superscripts differ at statistically significant levels ($p < .01$). *P* value represents an index of the reliability of a result.*

A two-way analysis of variance statistical test was conducted to examine differences in the number of experts retained by party and across the two time periods.⁸³ This analysis revealed that, while there was no general difference in the aggregate average number of experts proffered between the two time periods, there was an interesting statistically significant change nestled within the data contingent upon a combination of the litigant party and time period.

In general, the overall mean number of experts retained per case did not differ significantly between the pre- and post-*Daubert* time periods.⁸⁴ There was, however, a significant difference with respect to the litigant party, with

82. For a more detailed discussion of data screening and transformations performed in order to meet the assumptions of the statistical tests performed, see Flores, Richardson, & Merlino, *supra* note 76, at 14.

83. For a detailed discussion of analysis of variance (ANOVA) statistical techniques, see BRUCE M. KING & EDWARD W. MINIUM, *STATISTICAL REASONING IN THE BEHAVIORAL SCIENCES* 369 (5th ed. 2008). A two-way factorial ANOVA allows for the statistical comparison of two factors (e.g., time period and litigant party) with respect to a specific dependant variable (e.g., number of experts retained). A primary strength in utilizing this statistical analysis enables the simultaneous test for significant differences on multiple levels. More specifically, on one level it provides a test for differences in the factors generally (e.g., if the number of experts retained differs between the two time periods, and also if the number differs between litigant parties). Additionally, the analysis allows for more specific comparisons on the dependant variable taking into account specific levels of both factors. For example, it allows us to test whether the dependant variable (e.g., number of experts retained) at a specific combination of the factors (e.g., pre-*Daubert* plaintiff parties) differs from all other permutations of the factors (e.g. pre-*Daubert* defendant parties, post-*Daubert* plaintiff parties, and post-*Daubert* defendant parties).

84. $p > .2$.

plaintiff parties, in general, retaining a greater number of experts.⁸⁵ This difference was qualified by a statistically significant time period by litigant party interaction (see Figure 1).⁸⁶ The number of experts retained by defendant parties in the pre- and post-*Daubert* time periods did not differ at a statistically significant level.⁸⁷ However, the number of experts retained by plaintiff parties in the post-*Daubert* sample was significantly lower than the number retained in the pre-*Daubert* sample.⁸⁸ In addition, the number of experts retained by plaintiffs was significantly greater than the number retained by defendants in both the pre-*Daubert*⁸⁹ and post-*Daubert*⁹⁰ time period samples.

In summary, the results of this statistical analysis suggest that the brunt of *Daubert's* effect, with respect to the number of experts retained, was experienced by plaintiff parties. The number of experts retained by defendants did not change at statistically significant levels across the two time periods. Alternatively, plaintiff parties, though they proffered greater numbers of experts in both time periods, retained significantly fewer experts in the time period following *Daubert*.

85. $F(1, 378) = 44.48, p < .001$.

86. For discussion on interaction effects within the context of analysis of variance, see KING & MINIUM, *supra* note 83, at 373. A statistical interaction “refers to the joint effect of the two independent variables (factors) on the dependant variable If the test for an interaction is significant, it means that the effect of one factor depends on the level of the other factor.” In the current analysis, the litigant party effect was contingent upon the time period. The time period by litigant party interaction was statistically significant, $F(1, 378) = 61.58, p < .001$.

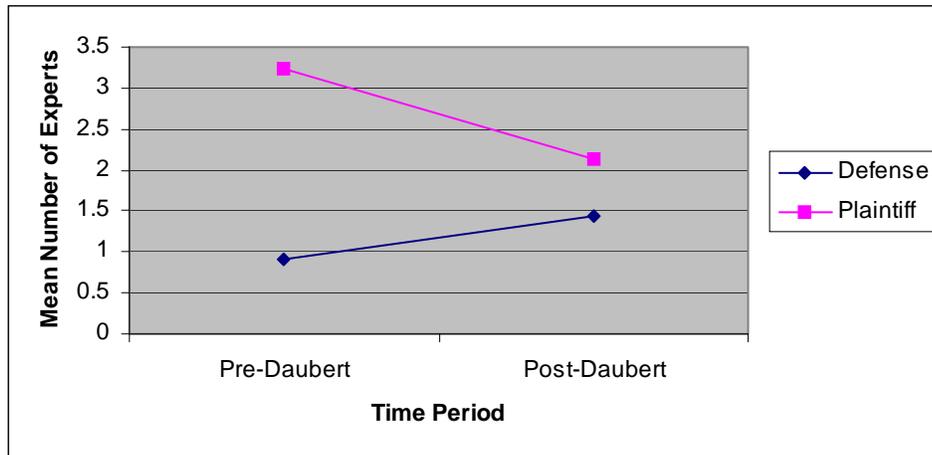
87. $p > .10$.

88. $p < .001$.

89. $p < .001$.

90. $p < .03$.

Figure 1. Mean number of experts retained per case: Time Period x Litigant Party interaction.



2. Changes in frequencies of expertise

A total of seventy-eight different classifications of expertise were included in the codebook utilized in the research.⁹¹ These classifications were further divided into nine general categories.⁹² Table 2 displays the frequency of experts retained during the two time periods partitioned according to these general categorizations. Chi-square statistical analysis was employed to examine if the frequency of experts in each of the respective categories differed between the two time periods.⁹³ The largest statistically significant differences were evidenced in health care and medicine (significant decrease), economics (significant increase), and engineering and technology (significant increase) fields. Notable differences were also found with increases in both business and law expertise.

91. For complete codebook, see Flores, Richardson, & Merlino, *supra* note 76, at 59.

92. *Id.*

93. The chi-square (χ^2) test is a statistical analysis used to analyze frequencies, that is, the number of cases that fall into each combination of categories. For example, in the current set of analyses, the chi-square test can be used to examine if the frequency with which a particular form of expertise is proffered statistically differs between pre- and post-*Daubert* time periods. For a comprehensive discussion of the mathematical basis and use of the chi-square statistical test, see KING & MINIUM, *supra* note 83, at 315.

Table 2. Frequency of Experts Retained: By General Category

| <i>Expertise</i> | <i>Time Period</i> | | χ^2 <i>statistic</i> |
|------------------------------|--------------------|------------------|---------------------------|
| | <i>1991–1992</i> | <i>2005–2006</i> | |
| Health Care/Medicine | 240 | 111 | 88.70*** |
| Engineering/Technology | 47 | 115 | 34.60*** |
| Physical Sciences | 9 | 15 | 1.46 |
| Social & Behavioral Sciences | 28 | 33 | 0.37 |
| Business | 38 | 54 | 2.88 ⁺ |
| Economics | 5 | 32 | 19.90*** |
| Law | 0 | 10 | N/A ¹ |
| Public Administration | 6 | 11 | 0.23 |
| Other | 20 | 18 | 0.15 |
| Total | 393 | 399 | |

*Notes: Superscript notations designate statistically significant differences at the following levels: + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$*

¹*Cell size of zero did not allow for the use of the chi-square statistical test*

Further analyses were conducted to examine for significant differences with respect to specific areas of expertise. Table 3 displays the individual areas of expertise for which there were statistically significant differences between the two time periods. A substantial decline was evidenced in the “other medical/ health care” classification, which was primarily comprised of medical doctors for whom there was no specific specialty designated in the filing reports. Several of the more prominent increases were in the areas of “other engineering/ technology,” accounting, and economics. Interestingly, these were specific domains of expertise that attorneys in interview research had perceived as being subject to increasing numbers of challenges, with engineering and technology experts often being utilized to attempt to establish

causation in complex product liability cases and accounting and economics experts being enlisted to testify regarding economic loss and damages.⁹⁴

Table 3. Individual Areas of Expertise with Significant Differences in the Frequency of Experts Retained

| <i>Expertise</i> | <i>Time Period</i> | | χ^2 statistic |
|---------------------------------------|--------------------|----------------|--------------------|
| | <i>1991-92</i> | <i>2005-06</i> | |
| <i>Medicine/Health Care</i> | | | |
| M.D.-Family/General practice | 3 | 16 | 8.91** |
| Surgery | 19 | 8 | 4.81* |
| Other medical/health care | 145 | 53 | 56.57*** |
| <i>Engineering/Technology</i> | | | |
| Accident reconstruction | 2 | 11 | 6.20** |
| Traffic engineering | 12 | 5 | 3.06 ⁺ |
| Fire/arson | 4 | 11 | 3.22 ⁺ |
| Other Engineering/technology | 24 | 54 | 12.30*** |
| <i>Social and Behavioral Sciences</i> | | | |
| Psychiatry | 12 | 5 | 3.06 ⁺ |
| Rehabilitation | 4 | 14 | 5.53* |
| <i>Business/Economics</i> | | | |
| Accounting | 5 | 20 | 9.06** |
| Economics | 5 | 27 | 15.42*** |

*Notes: Superscript notations designate statistically significant differences at the following levels: ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.*

94. David M. Flores, James T. Richardson, & Mara L. Merlino, Judge and Attorney Perspectives on the Impact of Daubert on Expert Evidence Practices in Federal Civil Court 29 (Aug. 20, 2008) (unpublished manuscript, on file with the author).

3. *Timing of retention of experts*

Review of the case files did not reveal patterns that would suggest attempts were being made to retain experts early in the discovery process in an effort to enforce settlement. The timing of retention of experts for both plaintiff and defense parties appeared to be comparable in cases from both the pre- and post-*Daubert* time periods, as there was no statistically significant difference between the two time periods with respect to the average number of days between the lawsuit filing and when the experts were disclosed by either the defense or plaintiff parties.⁹⁵ In qualitative interviews conducted by the authors with practicing attorneys from the South Carolina federal district, numerous individuals commented how the tight deadlines typical of South Carolina scheduling orders leave little leeway for efforts to strategically time the retention of experts.⁹⁶ In similar interviews conducted with federal judges, most respondents generally indicated that they had developed case management orders which had the general effect of making attorneys reveal their use of expert witnesses early in the process.⁹⁷

C. Challenges to Proffered Expert Evidence

Twenty-five cases in the sample included some form of challenge to expert evidence.⁹⁸ Twenty-two cases included only *in limine* challenges. Two cases included only summary judgment challenges and two cases included a combination of both summary judgment and *in limine* challenges. Chi-square statistical analysis revealed a marginally statistically significant association between the time period and the number of cases with challenges to proffered expert evidence, with a greater number of cases in the post-*Daubert* time sample (seventeen, including challenges) than the pre-*Daubert* sample (eight).⁹⁹

95. *ps* > .10.

96. Flores, Richardson, & Merlino, *supra* note 76, at 18.

97. *Id.* at 37.

98. See Table 4 *infra* p. 554.

99. $\chi^2(1) = 2.82$, $p < .08$.

Table 4. Frequency of cases with challenges to experts

| | <i>Time Period</i> | | χ^2 statistic |
|-------------------------|--------------------|---------|--------------------|
| | 1991–92 | 2005–06 | |
| Cases with challenge(s) | 8 | 17 | 2.82 ⁺ |

Note: Superscript notations designate statistically significant differences at the following level: ⁺ $p < .10$.

1. Challenges in limine

Twenty-three cases included a challenge *in limine* to an expert, with a total of forty-two challenges being raised. The number of challenges within a single case ranged from one (thirteen cases) to six (one case). Five cases had three challenges and four cases had two *in limine* challenges.

a. Frequency of *in limine* challenges to experts

Chi-square analyses were conducted to examine differences in the number of challenges to experts generally between the two years (see Table 5). Results revealed a significant association between the time period and the number of cases with challenges, as ten challenges were raised against experts in the pre-*Daubert* time period, compared to thirty-two in the post-*Daubert* time period.¹⁰⁰

Further analyses were conducted to look for differences with respect to the frequency of challenges raised in cases by the respective parties across years. Analyses revealed that the significant difference between the years was driven by challenges raised by defendants against plaintiff-proffered expert evidence. The number of challenges raised against defense-proffered expert evidence did not significantly differ between pre- and post-*Daubert* time periods.¹⁰¹ Alternatively, chi-square analysis revealed a statistically significant association between the time period and whether there were challenges to plaintiff-proffered experts. In the pre-*Daubert* time period sample, seven *in limine* challenges were raised against plaintiff expert witnesses, whereas in the post-*Daubert* time period, a total of twenty-eight *in limine* challenges were

100. $\chi^2(1) = 11.82, p < .001$.

101. $\chi^2(1) = 0.34, p > .5$.

raised by defense parties. Odds ratio analysis revealed plaintiff experts were 4.69 times more likely to be challenged during the post-*Daubert* period.

Table 5. Challenges to Experts within Time Periods: Motions *in limine*

| <i>Challenges to:</i> | <i>Time Period</i> | | χ^2 statistic |
|-----------------------|--------------------|---------|--------------------|
| | 1991–92 | 2005–06 | |
| Defense experts | 3 | 4 | 0.34 |
| Plaintiff experts | 7 | 28 | 21.88*** |
| Total | 10 | 32 | 11.82*** |

Note: Superscript notations designates statistically significant differences at the following level.*** $p < .001$.

b. Basis of *in limine* challenges to experts

Qualitative interview research conducted with practicing attorneys revealed that few individuals had experienced challenges directly relating to the substance of an expert's testimony in South Carolina civil courts prior to *Daubert*.¹⁰² Instead, if challenges arose during this time period, they were likely to be based on procedural matters, though this was also reported to have been an infrequent occurrence.¹⁰³ Table 6 presents the frequency for challenges across the two time periods categorized according to a distinction drawn between "Procedural/Other" and "Substantive" grounds. The procedural basis categorization includes grounds for challenge that are not related to the substance of an expert's testimony, and instead are focused on procedural matters (e.g., failure to designate an expert, failure to make adequate disclosures regarding an expert). Alternatively, the category labeled "Substantive" in Table 6 includes challenges based on grounds targeting the substance of an expert's testimony. These include factors related to the *Daubert* trilogy (falsifiability, error rate, peer review, and general acceptance) as well as others, such as relevancy, reliability, and qualifications. As the figures in Table 6 reveal, the number of challenges based on procedural grounds was comparable for the two time periods. In contrast, there was a substantial increase in the frequency of challenges with a "substantive" basis

102. Flores, Richardson, & Merlino, *supra* note 94, at 3.

103. *Id.*

in the post-*Daubert* sample. Analysis revealed this pattern of differences reached a level of statistical significance.¹⁰⁴ This trend was also evident in the aggregate number of grounds serving as foundation for these challenges. The numbers of procedural grounds cited in the challenges were relatively similar between the two time periods, with thirteen individual procedural grounds in challenges from the pre-*Daubert* time period and seventeen challenges in the post-*Daubert* sample. Alternatively, the figures from the substantive challenges diverged substantially. The two substantive challenges raised in the pre-*Daubert* sample were based solely on a single substantive ground: relevancy. In the post-*Daubert* time period, challenges integrated multiple substantive grounds into their overall bases, with a total of forty-nine individual substantive grounds cited as support for the twenty-five substantively-based challenges during this period.

Table 6. Frequency of *in limine* Challenges Categorized by Supporting Grounds

| <i>Basis for Challenge</i> | <i>Time Period</i> | |
|----------------------------|--------------------|---------|
| | 1991–92 | 2005–06 |
| Procedural/other | 8 | 7 |
| Substantive | 2 | 25 |

Table 7 delineates the specific grounds underlying *in limine* challenges during the respective time periods, and reveals that the increase in “substantive” grounds for *in limine* challenges was primarily driven by qualifications, relevancy, reliability, and falsifiability. Of the forty-nine grounds in the “substantive” category in the post-*Daubert* challenges, nineteen were based on the *Daubert* trilogy. Previous research has indicated that relevancy, qualifications, and reliability were often issues that factored into a judge’s decision to exclude an expert’s testimony.¹⁰⁵ The substantial increase in these grounds may reflect a sensitivity to this on the part of attorneys. It is interesting to note, however, that the grounds related to the *Daubert* trilogy (falsifiability, error rate, peer review, non-scientific testimony) were often joined with these other factors in the crafting of motions to exclude experts in the challenges from the post-*Daubert* time frame. Out of twenty-five

104. $p < 0.0002$, Fisher’s exact test.

105. Krafka et al., *supra* note 22, at 322.

challenges in the post-*Daubert* sample that included some form of “substantive” basis, nearly two-thirds (sixteen) included *Daubert* grounds.¹⁰⁶ Table 8 provides a more detailed breakdown of the areas of expertise challenged, and the basis of the motions, across the two time periods.¹⁰⁷

Table 7. Detailed List of Grounds for *in limine* Challenges by Time Period

| <i>Grounds for Challenge</i> | <i>Time Period</i> | | <i>Total</i> |
|---|--------------------|----------------|--------------|
| | <i>1991–92</i> | <i>2005–06</i> | |
| <i>Substantive</i> | | | |
| Qualifications | 0 | 10 | 10 |
| Credentials | 0 | 3 | 3 |
| Relevancy | 2 | 9 | 11 |
| Reliability | 0 | 8 | 8 |
| Validity | 0 | 1 | 1 |
| Falsifiability | 0 | 14 | 14 |
| Error rate | 0 | 1 | 1 |
| Peer review | 0 | 1 | 1 |
| General Acceptance | 0 | 0 | 0 |
| Non-scientific expert testimony | 0 | 2 | 2 |
| <i>Substantive</i> | | | |
| Failure to designate an expert | 5 | 0 | 5 |
| Failure to make adequate disclosures regarding expert | 1 | 1 | 2 |
| Testimony exceeds disclosed information | 0 | 4 | 4 |
| Other/procedural | 7 | 12 | 19 |

106. Only seven challenges were based solely on procedural grounds.

107. For a tabular representation of these data with an alternative organization, see Flores, Richardson, & Merlino, *supra* note 76, at 26.

Table 8. Grounds for *in limine* challenges to specific types of expertise by time period.

| <i>Grounds for Challenge</i> | <i>Expertise Challenged</i> | |
|------------------------------|-------------------------------|---|
| | <i>1991–1992</i> | <i>2005–2006</i> |
| Qualifications | N/A | Products Engineering, Forestry, Counselor Education, Accounting (2), Attorney-professional stand, Economics (3), Business |
| Credentials | N/A | Expert in Business, Products Engineering, Counselor Education |
| Relevancy | Civil Engineering, Psychiatry | Pharmacy, Biomedical Engineering, Safety Engineering, Attorney-Professional Stand, Economics (4), Business |
| Reliability | N/A | Chemical Engineering, Products Engineering (2), Safety Engineering, Counselor Education, Accounting, Economics |
| Validity | N/A | Forestry |
| Testability/ methodology | N/A | Pharmacy, Business (2) Biomedical Engineering, Electrical Engineering (3), Products Engineering (2), Safety Engineering, Counselor Education, Economics (3) |
| Error rate | N/A | Products Engineering |
| Peer review/publication | N/A | Pharmacy |

| | | |
|---|--|---|
| General acceptance | N/A | N/A |
| Non-scientific testimony | N/A | Economics (2) |
| Failure to designate expert | Other Medical/Health Care (2), Other Engineering/Technology (2), Insurance | N/A |
| Failure to make adequate disclosures | Other Medical/Health Care | Accounting |
| Testimony exceeds disclosed information | N/A | Accounting (3) |
| Other/procedural | Other Medical/Health Care (2), Other Engineering/Technology (3), Insurance | Surgery (3), Accounting, Other Engineering/Technology, Economics (4), Business, Insurance (2) |

Note: numbers in parentheses represent the number of times the specific classification of expertise was challenged on the designated ground.

c. Timing of *in limine* challenges

One potential litigation strategy utilizing *Daubert*, discussed by an attorney during qualitative research on expert evidence practices in civil court, revolved around the timing of *in limine* challenges.¹⁰⁸ While this attorney had not employed this strategy in his own practice or heard of its use in South Carolina federal courts, he was aware of the practice through his experience in courts of another state.¹⁰⁹ More specifically, this strategy entailed challenging an opponent's expert late in the discovery process, with little time remaining before scheduling deadlines.¹¹⁰ If the challenge proved successful, this would pose a substantial hindrance for the opposing party, who would in turn be left with little time to retain and disclose the expert opinions of another expert.¹¹¹ However, no specific incidences in which a challenge was raised immediately before deadlines specified in scheduling orders were located in

108. *Id.* at 25.

109. *Id.*

110. *Id.*

111. *Id.*

either the pre- or post-*Daubert* case samples drawn for purposes of research in this project. In addition, the overall timing of challenges did not differ at statistically significant levels between the two time periods.¹¹²

d. Disposition of *in limine* challenges.

The high rate of case settlement resulted in a limited amount of data pertaining to the disposition of *in limine* challenges. Only six motions from the sample were disposed of by judicial rulings,¹¹³ as all other cases were settled prior to a disposition of the challenge.¹¹⁴ Only one of the six challenges, a procedurally-based challenge by the plaintiff to engineering/technology evidence that was accepted in part, was from the pre-*Daubert* period. Of the five challenges in the post-*Daubert* sample, four were procedurally-based challenges (e.g., failure to make adequate disclosures regarding an expert, failure to designate expert, “other” procedural basis) raised by plaintiff parties.¹¹⁵ Two challenges were accepted and two were accepted in part. One challenge in the post-*Daubert* sample was *Daubert*-based. This challenge was raised against plaintiff-proffered fire/arson expert evidence, was based on reliability and falsifiability grounds, and cited *Daubert*, *Kumho* and the Federal Rules of Evidence. The challenge was accepted by the court, excluding a critical expert, and the case ultimately ended with a jury verdict favoring the defense.

2. Summary Judgment Challenges

Scant data was available in the data set regarding the use of summary judgment challenges; however, in each of the cases these motions appeared to have some degree of impact on case outcomes. Three summary judgment challenges were raised in the sample, all of which were from the post-*Daubert* time period.¹¹⁶ Two summary judgment motions were from the same product liability case and were *Daubert*-based, each targeting electrical engineering evidence proffered by the plaintiff. The challenges targeted evidence critical

112. $p > .10$.

113. For a detailed table presenting the data from these challenges, see Flores, Richardson, & Merlino, *supra* note 76, at 26.

114. The pilot research of Waters and Hodge, the only other study to integrate pretrial activity into its methodological design, also revealed high rates of settlement. See WATERS & HODGE, *supra* note 22, at 14.

115. Three of these challenges were levied at surgical expertise and one at accounting expertise.

116. For a detailed table presenting the data from these challenges, see Flores, Richardson, & Merlino, *supra* note 76, at 27.

to the plaintiff's case, and a settlement was reached not long after the filing of the motions and prior to judicial rulings. The other challenge, also from a product liability case concerning targeting and engineering evidence, was based on "other/procedural" grounds. This challenge was granted and the case ended in summary judgment.

IV. DISCUSSION

The preceding study, comparing samples of pre- and post-*Daubert* cases, represents an initial program of systematic research tailored specifically to both address deficits in the existing body of research and to further elucidate the effects of *Daubert* and its progeny on expert evidence practices in federal civil court. The unique characteristics of the data available in South Carolina allowed us to bypass several obstacles limiting previous research and provided the opportunity to extend the scope of analysis. Our work utilized a broader sampling scheme, drawing from a wider range of cases than the written district court and appellate opinions used in previous research, and incorporated cases with expert evidence that was not challenged, as well as those that did not proceed to trial. We increased our sample size to allow for formal statistical analyses that were not possible in previous pilot work utilizing a similar methodological approach.¹¹⁷ As recommended by Waters and Hodge, our work was designed to place an increased focus on pretrial and trial activities.¹¹⁸ Ultimately, these methodological adaptations were critical to the pursuit of the overarching goal of the study, namely, contributing to a better understanding of the broader impacts of *Daubert* and related cases in federal civil courts. To this end, results of this research revealed a variety of important findings.

With respect to trends in the overall frequency of expert evidence proffered, analysis of our sample of cases revealed findings suggesting a disparate impact of *Daubert* for civil litigant parties. There was no significant difference between the pre- and post-*Daubert* samples with respect to the overall average number of experts retained. Results demonstrated that plaintiffs, on average, retained a greater number of experts than did defendant parties, in both time periods. Further analysis probing this difference revealed an interesting significant finding that further elucidates the impact of *Daubert*. More specifically, there was a notable interaction, which indicated a significant decrease in the number of experts retained by plaintiff parties following the *Daubert* decision. However, the number of experts retained by defendants did not statistically differ across the two time periods. As

117. WATERS & HODGE, *supra* note 22, at 8.

118. *Id.* at 24.

suggested by one South Carolina civil attorney interviewed by the authors, these results indicate that *Daubert*'s effects, at least in terms of the number of experts retained, may have been felt most severely by plaintiffs, serving to "reign in the plaintiffs' use of experts."¹¹⁹

Our analyses also revealed significant differences with respect to the frequency with which certain types of expertise were retained during pre- and post-*Daubert* time periods. The most notable changes in the general categories of expertise were the significant increases in the areas of economics and engineering and technology, and the significant decrease in medical and health care. The considerable decline in the latter category is a finding that has not been replicated by other research, nor widely discussed as an area of expertise for which retention rates have substantially decreased following *Daubert*.

Further analysis regarding specific classifications of expertise revealed that the substantial decline in the general medical and health care category was largely driven by the "Other medicine/health care" subclassification, a category largely comprised of doctors for whom there was no specialty indicated in the case documents. Several of the more prominent increases were in the areas of "other" engineering and technology, accounting, and economics. Interestingly, these were specific domains of expertise that civil attorneys perceived as being subject to increasing numbers of challenges, with engineering and technology experts often being utilized to attempt to establish causation in complex product liability cases and accounting and economic experts being enlisted to testify regarding economic loss and damages.¹²⁰

The trend of disparate impact was evident in other domains as well. Analyses revealed additional significant differences between pre- and post-*Daubert* samples with respect to the frequency and basis of challenges to expert evidence. Comparison of the two periods indicated a significant increase in *in limine* challenges, both the number of cases involving these challenges and the overall number of challenges. This finding was echoed in the accounts of attorneys and judges from South Carolina, both groups of whom reported seeing a substantial rise in the frequency of challenges since the *Daubert* decision.¹²¹ The increase was primarily driven by a significant increase in the number of *in limine* challenges raised against plaintiff expert witnesses. These results parallel findings from the work of Risinger¹²² and

119. Flores, Richardson, & Merlino, *supra* note 76, at 45. Flores, et al., *Daubert in Federal Court*, *supra* note 25, at 45.

120. *Id.* at 17.

121. *Id.* at 29, 35.

122. Risinger, *supra* note 22, at 108–10.

Dixon and Gill,¹²³ who also found a larger number of challenges in their post-*Daubert* samples, a greater proportion of which were raised by defense parties.

Analysis further demonstrated differences with regard to the basis of challenges following *Daubert*. Whereas in the pre-*Daubert* sample challenges were based almost exclusively on procedural grounds (e.g., failure to designate an expert), *in limine* challenges in the post-*Daubert* period were based primarily on substantive grounds directly targeting the substance of the proffered expert evidence. This considerable increase in challenges based on substantive grounds was partially attributable to the utilization of *Daubert*-based principles in challenges, though there was also an accompanying increase in grounds related to traditional rules governing expert testimony. The most common grounds for challenges in the post-*Daubert* sample were qualifications, relevancy, falsifiability, and reliability. The increase in reliability as a basis for challenges paralleled certain aspects of Dixon and Gill's research,¹²⁴ which revealed standards for reliability tightened and *Daubert* factors were addressed more frequently at some point following *Daubert*. Overall, analysis of the South Carolina data suggests that *Daubert* has had a considerable impact with regard to challenges to proffered expert evidence. *In limine* challenges have grown in frequency, and the bases of these challenges are now based heavily on substantive grounds, including the *Daubert* standards.

The high rate of settlements resulted in a small sample size, which did not allow for the in-depth formal statistical analysis of challenge and case outcomes that were applied to other areas of our research. As a consequence, the resulting data in these areas are primarily descriptive, and caution should be exercised when drawing any related conclusions. *In limine* challenges disposed by judicial ruling were largely based on procedural grounds, with only one case including a substantive-based challenge. This challenge to a plaintiff-proffered expert was successful, resulting in the exclusion of a critical expert, and the trial resulted in a jury verdict for the defense. Each of the three summary judgment challenges, all of which were raised by the defense, seemed to have an impact on the case outcome. Both *Daubert* challenges targeted evidence central to the plaintiff's case and a settlement agreement was reached soon after the motions were filed. Previous research focusing on *Daubert*-related trial activity, notably that conducted by Risinger, has demonstrated that the pro-defense trend we found with regard to the number of challenges is also evident in the disposition of challenges, with challenges

123. Dixon & Gill, *supra* note 22, at 264, 270.

124. *Id.* at 271–76.

to plaintiff proffered experts having a higher success rates than those raised against defense experts.¹²⁵

As is true with all research, our work is characterized by a number of limitations that warrant consideration. Though the characteristics of the data from the post-*Daubert* years from which we drew our cases allowed us the unique opportunity to identify and sample cases with expert evidence that did not include a challenge or proceed to trial, these characteristics were not infallible indicators of the presence of expert evidence, and may have resulted in false-negatives in our sampling frame. Our work was also only conducted with data from one federal district, and our case sample was not as substantial as some of the larger-scale studies, which precluded statistical analysis in several areas. These caveats notwithstanding, the research presented here represents a valuable expansion on previous research. By broadening the scope of inquiry to examine the broader effects, our results both complement and extend the body of existing research, providing novel and important data with which to assess the effects of *Daubert* in federal civil court, and may serve as the basis for subsequent studies on this important front.

V. CONCLUDING COMMENT

Taken together, the data from this research, along with the current body of research utilizing cases analyses, reveal some rather pronounced effects of the *Daubert* decision and its progeny on expert evidence practices in Federal civil court. Even though some important findings were generated in our research, a word of caution is in order. During qualitative research conducted with federal civil judges, the authors were reminded by interviewees on more than one occasion that the *Daubert* decision was one change (albeit a major one) among many used by the federal court system to deal with heavy caseloads and the growing use of expert evidence.¹²⁶ Thus, concluding that *Daubert* led to all the changes delineated in our report could arguably be a spurious claim. Much more research is needed in order to tease out the effects of the various procedural changes that have occurred in the operation of the federal courts, and to ascertain which of the changes have had the most impact.

125. Risinger, *supra* note 22, at 110.

126. Flores, Richardson, & Merlino, *supra* note 94, at 47.