

Michigan Law Review

Volume 107 | Issue 2

2008

Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases

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Recommended Citation

David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223 (2008).

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PRACTICE MAKES PERFECT? AN EMPIRICAL STUDY OF CLAIM CONSTRUCTION REVERSAL RATES IN PATENT CASES†

David L. Schwartz*

This Article examines whether U.S. district court judges improve their skills at patent claim construction with experience, including the experience of having their own cases reviewed by the Court of Appeals for the Federal Circuit. In theory, higher courts teach doctrine to lower courts via judicial decisions, and lower courts learn from these decisions. This Article tests the teaching-and-learning premise on the issue of claim construction in the realities of patent litigation. While others have shown that the Federal Circuit reverses a large percentage of lower court claim constructions, no one has analyzed whether judges with more claim construction appeal experience fare better on subsequent appeals. Surprisingly, the data do not reveal any evidence that district court judges learn from prior appeals of their rulings. There is no suggestion of a significant relationship between experience and performance. The lack of evidence that Federal Circuit review aids district court judges is disconcerting. The Article explores three possible explanations for the lack of evidence: (1) that the nature of claim construction is indeterminate; (2) that district court judges are incapable of or not interested in learning how to perform claim construction; and (3) that Federal Circuit decisions do a poor job of teaching district court judges how to construe claims. These results shed critical light on the functioning of the patent system. Moreover, the results are relevant to a broader understanding of the relationship between higher and lower courts in general.

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Experience is the name everyone gives to their mistakes.

—Oscar Wilde

INTRODUCTION

Practice makes perfect—the old adage promises that the more you practice, the better you will become. No doubt this logic holds for many endeavors, from playing the trumpet to shooting basketballs to delivering a rousing speech. But does the truism carry over into judicial decision-making? Do judges learn to decide cases more accurately through experience?

This Article examines whether U.S. district court judges improve their skills at patent claim construction as a function of experience, specifically as a function of having their own cases reviewed by the Court of Appeals for the Federal Circuit. A core premise of the U.S. legal system is that legal doctrine is taught by higher courts and applied by lower courts.¹ Whether by rules or standards, high courts provide guidance that lower courts must consider. Implicit in this process is the notion that lower court judges are capable of learning the doctrine conveyed by higher courts. This Article analyzes how well this core premise of teaching and learning operates in the realities of patent litigation.

According to the teaching-learning theory, the Federal Circuit teaches district court judges how to perform patent claim construction.² Claim construction is the process of interpreting the specific terms or phrases used by the patentee to define the technology covered by the patent. Patent claim construction requires judges to understand the nuances of a particular technology at issue. After mastering the underlying technology in the case, district court judges must apply the claim construction doctrine as instructed by the Federal Circuit. Because learning the technology is essential to construing the claims, reading a body of case law alone is of limited value. Rather, district court judges must learn claim construction through hands-on practice. Previous studies have shown that the Federal Circuit reverses decisions on the issue of claim construction at an alarming rate.³ However, to date, no one has analyzed whether judges with more claim construction experience fare better on subsequent appeals.

This Article explores the issue for the first time using a novel database containing all Federal Circuit claim construction appeals of decisions from district court judges. The Article provides an extensive analysis into the reversal rates of district court judges with varying levels of patent experience as measured by instances of appellate review. Surprisingly, the data do not reveal any evidence that district court judges learn from appellate review of their rulings. The lack of evidence that Federal Circuit review aids district court judges is disconcerting. It suggests either that district court judges are

1. See Tonja Jacobi & Emerson H. Tiller, *Legal Doctrine and Political Control*, 23 J.L. ECON. & ORG. 326 (2007).

2. Presumably, the Federal Circuit has significantly greater expertise at claim construction than district courts. Jeffrey A. Lefstin, *Claim Construction, Appeal, and the Predictability of Interpretive Regimes*, 61 U. MIAMI L. REV. 1033, 1046 (2007).

3. See, e.g., Gretchen Ann Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time is Ripe for a Consistent Claim Construction Methodology*, 8 J. INTELL. PROP. L. 175 (2001); Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075 (2001); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1 (2001) [hereinafter Moore, *Judges Equipped*]; Kimberly A. Moore, *Markman Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK L. REV. 231 (2005) [hereinafter Moore, *Eight Years Later*]; Michael Saunders, *A Survey of Post-Phillips Claim Construction Cases*, 22 BERKELEY TECH. L.J. 215 (2007); Andrew T. Zidel, *Patent Claim Construction in the Trial Courts: A Study Showing the Need for Clear Guidance From the Federal Circuit*, 33 SETON HALL L. REV. 711 (2003).

incapable of or not interested in learning, or that Federal Circuit decisions do a poor job of teaching. The latter explanation is consistent with criticism by others that the Federal Circuit does not provide clear guidance on claim construction.⁴

There may be profound repercussions in our judicial system if judges are not learning how to decide patent cases from Federal Circuit review. Specialized courts are not needed for patent cases if the specialization does not translate into accuracy. Also, Congress is currently debating the creation of quasi-specialized patent trial judges.⁵ If experience does not lead to more expert decisions, much of the impetus behind the proposal dissipates.

There also might be serious repercussions if the Federal Circuit fails in its *teaching* role. Failure means the patent system is inconsistent or unpredictable and that the Federal Circuit has not succeeded in enhancing it. The Federal Circuit acknowledged its high reversal rate on district court judges' claim construction and noted that "a lack of predictability about appellate outcomes . . . may confound trial judges and discourage settlements."⁶ Unpredictability decreases the possibility of settlement, which raises legal costs and leaves companies, investors, and inventors uncertain whether their technologies will infringe the rights of others. Consequently, the Federal Circuit's failure to foster a predictable patent system may impede innovation.

A teaching failure may also have profound effects on the "students of the class"—the district court judges. Those judges may lose interest in trying to construe claims properly. They may become demoralized and believe that their work on patent claim construction is of no matter.⁷ This fatalism may

4. See, e.g., Russell B. Hill & Frank P. Cote, *Ending the Federal Circuit Crapshoot: Emphasizing Plain Meaning in Patent Claim Construction*, 42 IDEA 1 (2002); Timothy R. Holbrook, *Substantive versus Process-Based Formalism in Claim Construction*, 9 LEWIS & CLARK L. REV. 123 (2005); Kelly Casey Mullally, *Patent Hermeneutics: Form and Substance in Claim Construction*, 59 FLA. L. REV. 333 (2007); Craig Allen Nard, *A Theory of Claim Interpretation*, 14 HARV. J.L. & TECH. 1 (2000); Kristen Osenga, *Linguistics and Patent Claim Construction*, 38 RUTGERS L.J. 61 (2006); R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105 (2004).

5. H.R. 34, 110th Cong. (2007) (as referred to S. Comm. on the Judiciary, Feb. 13, 2007).

6. *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 469 F.3d 1039, 1040 (Fed. Cir. 2006) (Michel, C.J., dissenting); see also *Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1266 (Fed. Cir. 2005) (Gajarsa, J., dissenting) ("For various reasons this court already has a high reversal rate on claim construction issues, which tends to encourage appeals and, perhaps, discourage trial courts from heavily investing in claim constructions below.").

7. District Court Judge Patti Saris has stated that some district court judges are "demoralized" by the claim construction reversal rate. Kathleen M. O'Malley et al., *A Panel Discussion: Claim Construction from the Perspective of the District Judge*, 54 CASE W. RES. L. REV. 671, 682 (2004). District Court Judge Marsha J. Pechman stated that the high reversal rate on claim construction makes her believe that "you might as well throw darts." Anandashankar Mazumdar, *Federal District Courts Need Experts That Are Good 'Teachers,' Judges Tell Bar*, 70 PAT. TRADEMARK & COPYRIGHT J. (BNA) 536, 537 (2005); see also *Merck & Co. v. Teva Pharm. USA, Inc.*, 395 F.3d 1364, 1381 (Fed. Cir. 2005) (Rader J., dissenting) (noting that the Federal Circuit "often hears criticism from district court judges that its reversal rate on claim construction far exceeds that of other circuit courts"); *Ultratech, Inc. v. Tamarak Scientific Co.*, No. C 03-03235 CRB, 2005 WL 2562623, at *7 (N.D. Cal. Oct. 12, 2005) ("Nor can the Court say that Ultratech's claim construction position

tempt district court judges to resolve issues of claim construction quickly via either a preliminary injunction or a dispositive summary judgment for the sole purpose of obtaining prompt appellate court review. Alternatively, district courts may be wary of enforcing their judgments due to the high reversal rate.⁸ Although prompt appellate review may have some benefits, they are likely outweighed by the costs to the litigants and to judicial efficiency.

This Article has four parts. Part I expounds the law of patent claim construction and the various criticisms of the Federal Circuit's claim construction methodology. It then describes other empirical scholarship on claim construction.

Part II explains the study design and methodology. This explanation describes the process of locating and selecting the population of cases and lawsuits, and how the relevant information was coded. Part II also discusses limitations of the data and provides a measure of the reliability and validity of the data.

Part III sets forth the empirical results of the study. These results are broken down into three Sections. The first Section sets forth summary statistics of the information regarding the appealed cases, including the distribution of district court judges and the judicial districts. The second Section reports the claim construction success rate of previously appealed district court judges. The third Section compares other experience, such as overall judicial experience or total number of patent cases handled—as opposed to patent appeals experience—to claim construction reversal rates.

Part IV discusses various potential solutions to the problems with claim construction.

The Appendices to this Article outline details on the methodology used to create the databases, analyze the data using additional metrics of experience, and investigate the potential for selection bias.

I. CLAIM CONSTRUCTION AND PREVIOUS EMPIRICAL SCHOLARSHIP

Patent law is difficult. Not only is the law intricate and ever-changing, but the patents themselves describe complex and often cutting-edge technologies.⁹ District court judges are typically legal generalists, with no

is so frivolous as to warrant sanctions; to be candid, this Court is reluctant to hold that any claim construction is frivolous, given the well-known reversal rate in the Federal Circuit.”).

8. For example, one New York trial court stayed a permanent injunction against an adjudicated infringer until the Federal Circuit had a chance to review the claim construction. The trial court noted its concern about the high reversal rate of lower court's claim constructions as a partial basis for the stay. *Cargill, Inc. v. Sears Petroleum & Transp. Corp.*, No. 5:03 CV 0530(DEP), 2004 WL 3507329, at *12–13 (N.D.N.Y. Aug. 27, 2004) (finding that on balance a permanent injunction against continued infringement should be stayed pending appeal and noting cognizance of the Federal Circuit's “unusually high rate of reversal” in claim construction cases).

9. The Supreme Court has acknowledged that “patent litigation can present issues so complex that legal minds, without appropriate grounding in science and technology, may have difficulty in reaching decision.” *Blonder-Tongue Labs., Inc. v. Univ. of Ill. Found.*, 402 U.S. 313, 331 (1971).

training in patent law.¹⁰ They also commonly lack scientific training or a technical background.¹¹

As part of almost all patent infringement lawsuits, the judge eventually must determine the scope of the patent's reach—the limits of the patentee's right to exclude.¹² This determination is known as claim construction. It is often vigorously contested by the litigants, because claim construction is often the make-or-break determination in patent litigation. This Part sets forth a brief explanation of the law of claim construction and some problems associated with it that have affected district court judges.¹³ It then describes other empirical scholarship on claim construction.

A. *The Basics of Claim Construction*

Claim construction is often the centerpiece of patent litigation. At some point in nearly all patent infringement lawsuits, the patent claims¹⁴ or portions thereof must be interpreted to determine how infringement, validity, and other issues under the patent will be measured.¹⁵ Patents typically have multiple claims, and each claim is considered separately for issues of infringement and validity.¹⁶

In *Markman v. Westview Instruments, Inc.*, the Supreme Court ruled that judges, not juries, must construe patent claims.¹⁷ Since the *Markman* ruling, federal district court judges have been exclusively assigned the difficult task

10. Federal Circuit Judge S. Jay Plager has noted that district court judges typically do not handle a large volume of patent cases, and “the obscurities and peculiarities of patent law and the complexities of new technology are difficult for many district judges to handle on a one-time basis.” S. Jay Plager, *Abolish the Court of Federal Claims? A Question of Democratic Principle*, 71 GEO. WASH. L. REV. 791, 796–97 (2003).

11. *Id.* at 797 (“Most district court judges do not have scientific training, and most have not chosen law clerks with technical or patent backgrounds.”).

12. The court, not a jury, is required to perform this task. *See infra* note 17 and accompanying text.

13. Because technology and claim construction are somewhat foreign to most judges, judicial decision-making in this area is probably more deliberative than intuitive. *See* Chris Guthrie et al., *Blinking on the Bench: How Judges Decide Cases*, 93 CORNELL L. REV. 1, 8 (2007).

14. A patent claim is a single sentence at the end of an issued patent that “particularly” and “distinctly” points out what the invention is. 35 U.S.C. § 112 (2006).

15. *State Contracting & Eng'g Corp. v. Condotte Am., Inc.*, 346 F.3d 1057, 1067 (Fed. Cir. 2003) (“[W]e have held that a claim ‘must be construed before determining its validity, just as it is first construed before deciding infringement.’” (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 997 n.7 (Fed. Cir. 1995) (en banc), *aff'g*, 517 U.S. 370 (1996))); *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001) (“Because the claims of a patent measure the invention at issue, the claims must be interpreted and given the same meaning for purposes of both validity and infringement analyses.”).

16. *E.g.*, *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1220 (Fed. Cir. 1995) (“A patent is infringed if any claim is infringed . . . for each claim is a separate statement of the patented invention.” (citation omitted)); 5A DONALD S. CHISUM, CHISUM ON PATENTS § 18.03[1][c] (rev. 2007).

17. 517 U.S. 370 (1996).

of interpreting all controverted patent claims.¹⁸ Shortly after *Markman*, the Federal Circuit decided that the district court's claim construction analyses were subject to de novo review by the Federal Circuit.¹⁹ This combination of shifting the responsibility for claim construction from juries to judges and raising the standard of appellate review resulted in a substantial increase in the Federal Circuit's discretion in reviewing claim constructions.

B. Canons of Claim Construction

To aid district court judges in construing claims, the Federal Circuit has articulated canons of construction. Decisions of both the district courts and the Federal Circuit utilize these canons in their analysis. On some (if not most) occasions, the various canons are inconsistent and point toward contradictory claim constructions. Below is a general background on the canons of claim construction, with an emphasis on some common claim construction problems.

Sitting en banc in 2005, the Federal Circuit attempted to clarify how to construe patent claims in *Phillips v. AWH Corp.*²⁰ There, the Federal Circuit made clear that the preferred way to construe a claim was to study the "intrinsic evidence."²¹ This "intrinsic evidence" includes the claim language at issue,²² other claims in the patent, the remainder of the specification portion of the patent,²³ and the record of correspondence between the patent

18. Before 1996, the law was ambiguous as to whether claim construction was the responsibility of the judge or the jury. Consequently, the jury would often be charged with both interpreting what the patent meant and determining whether an accused device infringed the patent. *Markman*, 52 F.3d at 967.

19. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998) (en banc). Recently, several judges on the Federal Circuit have expressed a willingness to revisit *Cybor Corp.* and the de novo review of district court judge's claim construction. *Amgen v. Hoechst Marion Roussel, Inc.*, 469 F.3d 1039 (Fed. Cir. 2006). At the time of writing, there has been no change in the level of review.

20. 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Among other things, *Phillips* resolved a short-lived dispute within the Federal Circuit as to the proper role of dictionaries in claim construction. See, e.g., Joseph Scott Miller & James A. Hilsenteger, *The Proven Key: Roles and Rules For Dictionaries at the Patent Office and the Courts*, 54 AM. U. L. REV. 829, 905-11 (2005). After *Markman*, there was an increase in the use of dictionaries in construing claims by both district court judges and the Federal Circuit. *Id.* at 847. According to the dictionary line of cases, dictionaries should guide the "plain meaning" of the claim language. See e.g., *Texas Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202-04 (Fed. Cir. 2002). Specifically, the dictionary definition controlled unless the patent specifically redefined the term at issue in the body of the patent (known as the specification). A separate line of cases rejected the view that dictionaries were of primary significance in claim construction. For a fuller discussion of the discrete lines of cases, see Stephanie Ann Yonker, *Post-Phillips Claim Construction: Questions Unresolved*, 47 IDEA 301 (2007). *Phillips* ended the dispute, rejecting the line of cases favoring dictionaries. *Phillips*, 415 F.3d at 1320-21.

21. *Phillips*, 415 F.3d at 1314, 1316.

22. The claims are the numbered sentences at the end of a patent that point out the scope of the patentee's right to exclude others. 35 U.S.C. § 112 (2006).

23. The specification is the body of the patent that includes drawings and a detailed description of how to make and use the invention. *Id.*

applicant and the U.S. Patent Office (known as the “prosecution history”).²⁴ According to *Phillips*, the court must construe the claims based upon a review of this evidence.²⁵ Of the intrinsic evidence, the Federal Circuit stated that the specification of the patent document is “the single best guide” for determining the meaning of a claim.²⁶

Over the years, the Federal Circuit articulated various canons of construction concerning patent terms. *Phillips* did not materially change these canons or discourage their use, and it failed to establish any hard and fast rules on claim construction. At first blush, these canons provide a clear explanation as to how district court judges should construe any given claim term. In practice, however, they are more like standards than rules, and they leave gray areas with respect to claim construction. In many cases, at least one of the general canons will support each party’s respective position. In these cases, the district court judge must use his or her judgment, guided by Federal Circuit law, to balance the competing canons and effectively construe the patent claim.

Two canons of construction appear particularly contradictory. One canon of claim construction says that the court should not “read in a limitation” from the specification.²⁷ Said another way, if the claim language is broad and the examples in the detailed description in the patent document are narrow, the claim should be construed broadly. A second canon says that a claim must be read in view of the specification.²⁸ Arguably, this means that if the embodiments described in the detailed description of the patent are all narrow, then the language in the claim must also be narrowly construed.

In *Phillips*, the Federal Circuit noted the difficulties raised by these seemingly contradictory canons. However, it asserted that the line between the two canons could be “discerned with reasonable certainty and predictability.”²⁹ It further contended that:

[U]pon reading the specification in . . . context, it will become clear whether the patentee is setting out specific examples of the invention to accomplish [the goals of the invention], or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive.³⁰

24. *Phillips*, 415 F.3d at 1314–15, 1317. Presumably the claim language itself is the most important device to determine the meaning.

25. *Id.* at 1314. Claim “terms” refer to phrases within the claim. To “construe” the claim is to determine the meaning of the words or terms used in the claim.

26. *Id.* at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

27. 5A CHISUM, *supra* note 16, § 18.03[2][c][i][A].

28. *Id.* § 18.03[2][b].

29. *Phillips*, 415 F.3d at 1323.

30. *Id.*

In other words, the Federal Circuit believed that reading the patent would clarify the applicable canon in each case. Yet, notwithstanding its remarks, the line between these canons is often murky.³¹

In addition to these two frequently contradictory canons, the Federal Circuit has approved numerous others. For example, one canon urges the court to consider “claim differentiation.”³² Essentially, this means that claims should be construed so that each claim has a different scope. It works as follows: suppose a patent has two claims, one of which uses a broader term to describe an aspect of the invention, and the other of which uses a narrower term. In construing the broader term, the doctrine of claim differentiation urges that the broader term not be construed to mean the same as the narrower term. To construe the claims otherwise would render the narrower term superfluous. Other canons instruct that a claim should be construed to preserve its validity whenever possible and that a claim should be interpreted to include its preferred embodiment.³³

A case which exemplifies district court judges’ difficulty in determining which canon of construction to apply is *Nystrom v. Trex Co.*³⁴ *Nystrom* presented the federal district court with a seemingly simple task: to construe the meaning of the term “board.”³⁵ The term appeared relatively straightforward. The patent-in-suit related to a construction material for use in flooring surfaces, and more specifically to boards for use in constructing an exterior surface such as a deck.³⁶ However, construing the term “board” under the applicable canons of claim construction proved to be anything but straightforward.³⁷

The patentee, *Nystrom*, argued that the term “board” should be construed according to its ordinary meaning to those of skill in the art: any elongated piece of material for use in building.³⁸ The accused infringer, *Trex Co.*, asserted that the term “board” must be construed more narrowly to mean a “piece of elongated construction material made of wood and cut

31. Judge Ronald Whyte, a district court judge with considerable patent experience, has stated that these canons of construction “seem to be difficult to reconcile with one another.” See *O’Malley et al.*, *supra* note 7, at 675.

32. See, e.g., *Andersen Corp. v. Fiber Composites, Inc.*, 474 F.3d 1361, 1369 (Fed. Cir. 2007).

33. For a more detailed discussion of claim construction, see, for example, EDWARD D. MANZO, CLAIM CONSTRUCTION IN THE FEDERAL CIRCUIT (2008 ed.); Markman Subcomm. of the Patent Litig. Comm. of the Am. Intellectual Prop. Law Ass’n, *The Interpretation of Patent Claims*, 32 AIPLA Q.J. 1 (2004).

34. No. 2:01 cv 905, 2002 U.S. Dist. LEXIS 27501 (E.D. Va. Aug. 19, 2002).

35. *Id.* at *1.

36. *Nystrom v. Trex Co.*, 374 F.3d 1105, 1107 (Fed. Cir. 2004), *withdrawn and superseded*, 424 F.3d 1136 (Fed. Cir. 2005).

37. See *Nystrom v. Trex Co.*, 424 F.3d 1136 (Fed. Cir. 2005), *withdrawing and superseding*, 374 F.3d 1105 (Fed. Cir. 2004).

38. *Nystrom*, 374 F.3d at 1110–11.

from a log.³⁹ The construction of the term was case dispositive: Trex Co.'s product did not use wood cut from a log.⁴⁰ Thus, if the term was construed as requiring that the product use wood from a log, Trex Co. would be entitled to summary judgment.⁴¹

As support for his claim construction, Nystrom argued that the specification and prosecution history did not disclaim the broad general definition of a "board."⁴² Nystrom argued that the claim language did not include any express limitation as to the material of the "board."⁴³ Trex Co. countered that the specification of Nystrom's patent only disclosed a board as made of wood and cut from a log.⁴⁴ The specification stated that the board of the present invention was "a superior product *when cut from a log.*"⁴⁵ Trex Co. also argued that arguments made by Nystrom during prosecution⁴⁶ of the application that became the patent-in-suit supported a narrow construction of the term "board."⁴⁷

Nystrom urged the court to rely upon the canon that limitations should not be imported from the specifications into the claims. Trex Co. urged the court to rely upon the canon that the claim must be interpreted in light of the specification. After considering the issue, the district court adopted the defendant's proposed construction.⁴⁸ The district court found that the term "board" meant "a piece of elongated construction material made from wood cut from a log," and therefore it granted summary judgment of non infringement against Nystrom.⁴⁹

A divided Federal Circuit panel reversed the district court's grant of summary judgment and construed the term "board" to mean "an elongated, flat piece of wood or other rigid material."⁵⁰ The Federal Circuit considered the specification of the patent-in-suit.⁵¹ The specification, in relevant part, stated that the "board . . . yields a superior product *when cut from a log.*"⁵² The Federal Circuit found that this statement, which the district court heav-

39. *Id.* at 1111.

40. *Id.* at 1109.

41. *See id.* at 1109–10.

42. *Id.* at 1110–11.

43. *Id.*

44. *Id.* at 1111.

45. *Id.* at 1112 (emphasis added by court).

46. In this context, "prosecution" describes the interaction between the applicant or its attorney and the U.S. Patent Office with regard to an application for a patent.

47. *Nystrom*, 374 F.3d at 1111.

48. *Nystrom v. Trex Co.*, No. 2:01 cv 905. 2002 U.S. Dist. LEXIS 27501, at *5 (E.D. Va. Aug. 19, 2002).

49. *Nystrom*, 374 F.3d at 1109, 1110.

50. *Id.* at 1113.

51. *See id.* at 1112.

52. *Id.* (emphasis added by court).

ily relied upon as support for a narrow construction, actually supported a broad construction.⁵³ The Federal Circuit noted that this language “implicitly recognize[d]” that the board may be made of materials other than wood.⁵⁴ To the Federal Circuit, it was of primary importance that the claim simply stated “‘board,’ without restricting the term to a particular material or describing characteristics of wooden boards cut from logs.”⁵⁵

Because of the *Phillips* decision,⁵⁶ the Federal Circuit withdrew its *Nystrom* opinion and substituted a new unanimous opinion by the same panel.⁵⁷ The substituted opinion again acknowledged that the claim language did not describe “board” as being cut from a log or made of wood.⁵⁸ However, the Federal Circuit reversed its previous holding by stating that “board” must be construed as limited to boards made of wood.⁵⁹ According to the Federal Circuit’s substituted opinion, *Nystrom* had consistently used the term “board” to describe wooden decking material cut from a log.⁶⁰ Thus, construing “board” as made of wood was necessary to conform to the canon that the claim language must be read in light of the specification.⁶¹ In rehearing the case, the Federal Circuit affirmed the district court’s grant of summary judgment of non-infringement.⁶²

As *Nystrom* exemplifies, there are clear problems with claim construction. Despite the fact that the canons of claim construction seem to be useful and practical tools for district court judges, in many cases at least one claim term will implicate contradictory canons of construction. At this point, the district court judge may need to use some reason and discretion in interpreting the claim. It is an open question whether district court judges with proper training can correctly determine which canon of construction to use. If the line between conflicting canons of construction can be objectively ascertained, then district court judges should be able to learn how to properly construe claims. On the other hand, if the nature of claim construction is inherently indeterminate, then experience with claim construction will not likely help.

53. *See id.*

54. *Id.*

55. *Id.* at 1112–13 (finding that Trex Co.’s proposed narrower construction would improperly import limitations into the claim from the specification).

56. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

57. *Nystrom v. Trex Co.*, 424 F.3d 1136 (Fed. Cir. 2005).

58. *Id.* at 1143.

59. *Id.*

60. *Id.* at 1143–44.

61. *See id.* at 1144–45.

62. *Id.* at 1151.

C. Empirical Literature on the Difficulties of Claim Construction

Others have conducted impressive empirical studies on the Federal Circuit's handling of claim construction cases.⁶³ These studies reveal a serious problem with claim construction in U.S. courts.⁶⁴ None of the studies tracks the performance of the district court judges as individuals, however. Instead, they all treat the district court judges as a group, and only rarely has the information about district court performance been segregated by judicial district.

The most comprehensive study was performed by Judge Kimberly A. Moore, then a professor at George Mason University.⁶⁵ Judge Moore studied all precedential, non-precedential, and summary affirmance decisions of the Federal Circuit from April 23, 1996 (the date of the Supreme Court's *Markman* decision⁶⁶) through 2003.⁶⁷

Judge Moore found that the district courts wrongly construed 34.5% of claim terms.⁶⁸ She defined "wrongly construed" to mean that the "Federal Circuit determined that the district court claim construction was wrong (even if it did not actually result in reversal of the judgment) on a term-by-term basis."⁶⁹ According to her data, in 37.5% of cases, the district courts wrongly construed at least a single term.⁷⁰ Judge Moore also found that 29.7% of the judgments entered in patent cases had to be reversed or vacated because of an erroneous claim construction.⁷¹ Judge Moore's article reports the outcomes of cases by each appellate judge.⁷² In doing so, it does not disaggregate or otherwise analyze the claim construction appeals by district court judge.

In an earlier empirical study, Judge Moore had speculated that the cause of the errors in claim construction lay at the feet of the district court judges. She asserted that her data "suggest[ed] that judges [were] not, at present, capable of resolving these issues with sufficient accuracy."⁷³ In her later study, Judge Moore questioned whether this "high reversal rate could be due to the fact that district court judges lack technical training and repeat expo-

63. See sources cited *supra* note 3.

64. The claim construction reversal rate has been tabulated to be between twenty-five and fifty percent. See Moore, *Eight Years Later*, *supra* note 3, at 233.

65. Moore, *Eight Years Later*, *supra* note 3.

66. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

67. Moore, *Eight Years Later*, *supra* note 3, at 239. This supplemented her previous study covering the period from April 23, 1996 to December 31, 2000. Moore, *Judges Equipped*, *supra* note 3, at 8-9.

68. Moore, *Eight Years Later*, *supra* note 3, at 239.

69. *Id.* at 238.

70. *Id.* at 239.

71. *Id.*

72. *Id.* at 244 tbl.2.

73. Moore, *Judges Equipped*, *supra* note 3, at 38.

sure to claim construction.”⁷⁴ She rejected this hypothesis as “unlikely” because “construing claim terms in a given patent does not make construing claim terms in a different patent any easier.”⁷⁵ Eventually, Judge Moore speculated that the Federal Circuit was to blame for the high reversal rate that she had identified.⁷⁶ She put forward that the Federal Circuit had not “evolved” the canons of construction sufficiently to guide district court judges.⁷⁷

Christian Chu also performed an empirical analysis of the Federal Circuit’s claim construction cases.⁷⁸ Chu found that between January 1, 1998 and April 30, 2000, the Federal Circuit modified claim constructions in forty-four percent of the 179 appealed cases.⁷⁹ Chu was clear that he included only cases in which the Federal Circuit had “expressly” reviewed a district court’s claim construction.⁸⁰ But by so defining his study, he excluded all Rule 36 cases, in which the Federal Circuit summarily affirmed the district court’s claim construction decisions.⁸¹ Judge Moore, in discussing Chu’s study, notes that omitting Rule 36 cases has a “profound . . . impact on the results” and on the study of claim construction reversal rates.⁸² Because he excluded Rule 36 cases, Chu’s results are biased toward showing a higher claim construction reversal rate because all of the excluded Rule 36 cases affirm the district court’s claim construction.⁸³

Chu investigated whether the more active judicial districts were less likely to be reversed on claim construction.⁸⁴ He divided the appellate cases into two groups based upon whether they originated from “more active” or “less active” tribunals. Chu designated a tribunal as “more active” if more

74. Moore, *Eight Years Later*, *supra* note 3, at 246.

75. *Id.*

76. *Id.* at 247.

77. *Id.*

78. Chu, *supra* note 3.

79. *Id.* at 1092, 1104.

80. *Id.* at 1094, 1100 n.121.

81. Federal Circuit Rule 36 permits the Federal Circuit to affirm a decision of a lower court without any written opinion. According to the rule, summary affirmances are limited to situations when “an opinion would have no precedential value” and one of the following is present:

- (a) the judgment, decision, or order of the trial court appealed from is based on findings that are not clearly erroneous;
- (b) the evidence supporting the jury’s verdict is sufficient;
- (c) the record supports summary judgment, directed verdict, or judgment on the pleadings;
- (d) the decision of an administrative agency warrants affirmance under the standard of review in the statute authorizing the petition for review; or
- (e) a judgment or decision has been entered without an error of law.

Fed. Cir. R. 36.

82. Moore, *Eight Years Later*, *supra* note 3, at 235 n.15, 236.

83. Without reviewing the Rule 36 cases themselves, Chu attempted to extrapolate their effect. *See* Chu, *supra* note 3, app. A at 1144–47.

84. *Id.* at 1125–27.

than ten of its cases were reviewed by the Federal Circuit during the period of his study.⁸⁵ Chu's study could not predict with confidence that the district court from which a case originates affects the likelihood that the Federal Circuit will change the lower court's claim construction.⁸⁶ Despite the lack of statistical significance in his results, Chu nonetheless speculated that his study demonstrated a pattern: "[T]he lower reversal rate [among more active tribunals] seemingly supports the theory that claim construction by a trial judge with substantial patent experience may decrease the prospect of reversal on appeal. Perhaps there is some truth in the notion that experience does matter."⁸⁷

Thus, Chu speculated that experience reduces the claim construction reversal rate.⁸⁸ Perhaps because of the difficulties involved, Chu did not obtain the identities of the district court judges involved in his dataset. Accordingly, his speculation regarding judicial experience in patent cases was left untested.

R. Polk Wagner and Lee Petherbridge performed a slightly different empirical assessment of the Federal Circuit's claim construction cases.⁸⁹ Rather than focusing on reversal rates, Wagner and Petherbridge focused on the methodology used by Federal Circuit judges. They found that the judges on the Federal Circuit were divided between two methodological approaches to claim construction—a procedural methodology and a holistic methodology.⁹⁰ Judges either fit into one of these two methodologies or are "swing" judges.⁹¹ Because of this split in approaches, according to Wagner and Petherbridge, claim construction at the Federal Circuit is panel dependent.⁹² Put another way, the panel of judges that hears the appeal has a statistically significant effect on how the patent claim is construed. Wagner and Petherbridge later expanded upon their work to analyze the effect of *Phillips*.⁹³ Yet

85. *Id.* at 1122. Chu included the following courts in the "more active" category: the Central District of California, the District of Delaware, the District of Massachusetts, the District of Minnesota, the District of New Jersey, the Eastern District of Michigan, the Eastern District of Virginia, the Northern District of California, the Northern District of Illinois, the Southern District of Florida, and the Southern District of New York. Chu also included appeals from the Board of Patent Appeals and Interferences, the Court of Federal Claims, and the International Trade Commission in the "more active" tribunal group. All other courts were in the "less active" tribunal group. *Id.*

86. *Id.* at 1127.

87. *Id.* Chu based this statement on a comparison of the average claim construction reversal rate to the average overall reversal rate for active tribunals. *Id.*

88. *Id.*

89. Wagner & Petherbridge, *supra* note 4, at 1110–11. Wagner and Petherbridge's study included all appeals to the Federal Circuit dealing with claim construction, whether from the district courts or other fora. *Id.* at 1145.

90. *Id.* at 1158–59.

91. *Id.* at 1112.

92. *Id.* at 1112, 1158–59.

93. R. Polk Wagner & Lee Petherbridge, *Did Phillips Change Anything? Empirical Analysis of the Federal Circuit's Claim Construction Jurisprudence* (Mar. 30, 2008) (unpublished manuscript, on file with author).

they were unable to confirm that *Phillips* had a “significant impact on the stability and predictability of the Federal Circuit’s claim construction jurisprudence.”⁹⁴

While the above studies add tremendous value in understanding how the Federal Circuit construes claims, they do not explain how individual district court judges fare with claim construction. A number of studies have looked at the decision-making of individual Federal Circuit judges, and other studies have looked at district court judges in the aggregate or the district level.⁹⁵ Until the present research, however, there has been no examination of individual district court judges.⁹⁶

II. STUDY DESIGN AND METHODOLOGY

For this study, data was gathered relating to two distinct events in the life of a lawsuit: filing and resolution on appeal. From these two distinct events, two databases were created: an appellate decision database and a district court judge lawsuit database. A summary of how the decisions for the appellate database were selected and coded, and the reliability of the appellate database, is set forth in Sections II.A and II.B. A summary relating to the district court judge database is set forth in Section II.C. To permit ease of replication, ample explanation is provided of the sources and methods used in the present study in the Appendix.⁹⁷ Overall, the databases contain 952 cases and 453 district court judges.

Before moving to the details concerning each database, it is important to note the distinctions between the two databases. For the appellate database, data was gathered about certain appellate decisions. The database contains information on Federal Circuit *decisions*, not lawsuits. Part of the reason for

94. *Id.* at 26.

95. *See, e.g.,* Bender, *supra* note 3, at 203, 206–07 (finding that between April 1996 and the middle of 2000, the Federal Circuit reversed forty percent of the 160 appealed claim constructions); Saunders, *supra* note 3, at 235–37 (finding that between July 2005 and September 2006, the Federal Circuit reversed at least one claim in 53.5% of cases); Zidel, *supra* note 3, at 741–42 (finding that in 2001, the Federal Circuit reversed thirty-nine of the ninety-four claim constructions).

96. A recent student comment on specialized patent courts attempts to analyze “whether district court judges who currently hear the most patent cases are better at claim construction.” Nancy Olson, Comment, *Does Practice Make Perfect? An Examination of Congress’s Proposed District Court Patent Pilot Program*, 55 UCLA L. REV. 745, 745 (2008). The short empirical portion of the otherwise strong comment relies upon the number of district court opinions electronically available on Lexis as the measure of judicial experience. *Id.* at 772–73. The use of electronically available district court opinions has been heavily criticized as possibly “unrepresentative.” *See, e.g.,* David A. Hoffman et al., *Docketology, Districts Courts, and Doctrine*, 85 WASH. U. L. REV. 681, 686–87 (2007); Pauline Kim et al., *How Should We Study District Court Judge Decision-Making?*, 29 WASH. U. J.L. & POL’Y (forthcoming 2008) (manuscript at 7, on file with author). The comment also excluded Rule 36 cases and included Lexis cases only from a limited period. Olson, *supra*, at 771–73. The similarity of this Article’s title and that of the above comment is purely coincidental due to the overlapping times of submission and publication.

97. Mark A. Hall & Ronald F. Wright, *Systematic Content Analysis of Judicial Opinions*, 96 CAL. L. REV. 63, 105–06 (2008) (stating that it is crucial for a study using systematic content analysis to permit partial or full replication).

this choice was ease of comparison, because others had similarly limited their datasets.⁹⁸ A single lawsuit is not necessarily tied to one appellate decision; rather, a single lawsuit may generate multiple appeals.⁹⁹ In the appellate dataset, it was more common that each lawsuit generated only a single appeal.¹⁰⁰ Further, a vast majority of lawsuits result in a settlement rather than appealable judgment, and therefore generate no appeals.¹⁰¹ Because the appellate database is premised upon federal appeals, these lawsuits are completely absent from the appellate database.

By contrast, the district court judge database measures lawsuits. More particularly, the district court judge database measures the number of patent lawsuits filed each year that were the responsibility of certain district court judges. It does not measure how far, if at all, each lawsuit had progressed. Some lawsuits may have been resolved immediately after filing of the complaint, while others may have gone through trial, appeal, remand, and retrial. Consequently, the district court judge database is not limited to cases in which claim construction was decided by the trial judge. The database merely provides a measure of the size of a district court's entire patent docket.

A. *The Appellate Decisions*

The appellate database includes all the Federal Circuit cases in which the parties disputed the district court's construction of a claim limitation. These cases, issued between April 24, 1996 (the date of the Supreme Court's decision in *Markman*) and June 30, 2007, include all precedential opinions, non-precedential opinions, and Rule 36 affirmances. For clarity, this Article refers to the precedential opinions and non-precedential opinions in which a written opinion was issued as "opinion cases." This Article refers to cases in which the Federal Circuit affirmed the district court's decision without opinion under Federal Circuit Rule 36 as "Rule 36 cases."

As is described in more detail in the Appendix, LexisNexis and Westlaw search engines were both used to locate the relevant decisions for the appel-

98. *E.g.*, Chu, *supra* note 3, at 1093; Moore, *Eight Years Later*, *supra* note 3, at 39; Moore, *Judges Equipped*, *supra* note 3, at 9.

99. For example, in 1998 Beckson Marine, Inc. sued NFM, Inc. in the Western District of Washington. The district court judge construed one claim term and granted summary judgment, holding there was non-infringement. On appeal, the Federal Circuit reversed and remanded. *Beckson Marine, Inc. v. NFM, Inc.*, 292 F.3d 718 (Fed. Cir. 2002). The district court judge construed additional terms and found in favor the accused infringer. This resulted in another appeal to the Federal Circuit on claim terms construed after remand. *Beckson Marine, Inc. v. NFM, Inc.*, 144 F. App'x 862 (Fed. Cir. 2005).

100. In total, however, less than two percent of the cases in the appellate database resulted in more than one appeal on claim construction.

101. Jay P. Kesan & Gwendolyn G. Ball, *How Are Patent Cases Resolved? An Empirical Examination of the Adjudication and Settlement of Patent Disputes*, 84 WASH. U. L. REV. 237, 273–74 (2006) (finding that between sixty-five and sixty-eight percent of all patent cases filed in three particular years were resolved via settlement or a probable settlement).

late dataset.¹⁰² An overinclusive search query was performed for both the opinion cases and the Rule 36 cases.¹⁰³ Because of the inherent differences between the opinion cases and the Rule 36 cases, separate protocols were used to determine the relevancy and obtain the fields of interest.

For the opinion cases, human coders read each case located by the LexisNexis search to determine relevancy. A decision was deemed relevant if it contained a resolution by the Federal Circuit of an issue of patent claim construction that had been decided by a district court. Both custom-designed software and human coders obtained pertinent information from the opinion cases, such as disposition of the case, number of claim terms disputed, and identity of the district court judge. There were a total of 746 relevant opinion cases.

The Rule 36 cases located by a Westlaw search were manually coded. Because the entire decision in a Rule 36 cases consists of the term “Affirmed,” the coder required an alternative method to determine if claim construction was at issue. Specifically, the coder reviewed the appellate briefing to the Federal Circuit for each case to determine relevancy. A Rule 36 case was deemed relevant if the appellant disputed the district court’s claim construction. If the briefing indicated that the case was relevant to claim construction, the coders obtained the pertinent information from the appellate briefs. There were a total of 206 relevant Rule 36 cases. Thus, combining the opinion cases and the Rule 36 cases, there were a total of 952 cases in the appellate database.

B. *Reliability and Validity of the Appellate Decision Database*

For any empirical project, the measurement of data must be evaluated in two key dimensions: reliability and validity.¹⁰⁴ Reliability is the extent to which others can duplicate the measurement and arrive at the same value.¹⁰⁵ Validity is the extent to which the measurement reflects the actual underlying item being measured.¹⁰⁶ The reliability of the human coding during the project was tested. As set forth below, the reliability of coding the opinion cases and the Rule 36 cases were each separately verified. The reliability and validity of the combined appellate database were also verified by comparison to Judge Moore’s study.

The level of inter-coder agreement was calculated for two aspects of the appellate database: whether the decision was relevant to claim construction, and how the Federal Circuit resolved the claim construction term(s).

102. See *infra* Appendix A.1, A.2.

103. For the precise queries, see *infra* Appendix A.1, A.2.

104. Lee Epstein & Gary King, *The Rules of Inference*, 69 U. CHI. L. REV. 1, 81–97 (2002).

105. *Id.* at 83.

106. *Id.* at 87.

Cohen's Kappa was chosen as the measure of inter-coder agreement.¹⁰⁷ Cohen's Kappa ranges from 0 to 1, with numbers near 1 indicating a higher degree of reliability. As explained in more detail in the Appendix, Cohen's Kappa ranged from 0.845 to 0.925 for the datasets.¹⁰⁸ Based upon the inter-coder agreement results, the datasets in this study appear very reliable.

The reversal rates of the cases in the appellate database were calculated using the same three methods that Judge Moore used. Additionally, in order to compare the present data with that of Judge Moore, the reversal rates for the same time periods used by Judge Moore were calculated.¹⁰⁹ Below in Table 1 is a summary comparison of the data of the present study with Judge Moore's.

TABLE 1
COMPARISON OF APPELLATE DECISION DATABASES
(PERIOD: 4/23/1996–12/31/2003)

	Judge Moore	Present Study
Percentage of terms wrongly construed	34.5%	33.9%
Percentage of cases with at least 1 wrongly construed term	37.5%	38.8%
Percentage of cases reversed, vacated, and/or remanded because of erroneous claim construction	29.7%	29.3%

This comparison shows that the data of the present study is consistent with the cases selected and coded by Judge Moore.¹¹⁰ This consistency supports the proposition that the data is reliable and facially valid.¹¹¹

C. The District Court Judge Lawsuit Database

For each district court judge that had at least one claim construction appeal before the Federal Circuit, information relating to his or her experience was collected, including how long each district court judge had been on the

107. Hall & Wright, *supra* note 97, at 113–14 (stating that the best practice for relaying reliability information is to report a coefficient such as “Cohen’s Kappa”); Lee Petherbridge & R. Polk Wagner, *The Federal Circuit and Patentability: An Empirical Assessment of the Law of Obviousness*, 85 TEX. L. REV. 2051, 2074–75 (2007) (reporting Cohen’s Kappa for intercoder reliability).

108. See *infra* Appendix A.3.

109. Moore, *Eight Years Later*, *supra* note 3, at 239–45.

110. The data in the present study could not be compared with Chu’s results because it appears that Chu included non-district court decisions (i.e., appeals from the Board of Patent Appeals and Interferences and from the International Trade Commission) in his analysis. Chu, *supra* note 3, at 1092. The data in this study are likewise not comparable to those set forth in Michael Saunders’s recent work analyzing post-*Phillips* claim construction cases. Saunders, *supra* note 3. Saunders excluded Rule 36 results, preventing their use in this Article for comparison purposes. *Id.* at 235.

111. See Epstein & King, *supra* note 104, at 89–90.

federal bench and when each judge was born. Additionally, the district court judge database includes the number of patent cases each judge handled every year from 1995 until 2005.

The foregoing patent case information was gathered for cases filed between January 1, 1995 and December 31, 2005. The yearly number of patent cases handled by each district court judge was obtained through LexisNexis's CourtLink service.¹¹² This year range was selected to correspond roughly to the years of appellate data collected. The slight offset in years—the start date is January 1, 1995 for the district court cases and April 23, 1996 for the appellate court cases, and the end date is December 31, 2005 for the district court cases and June 30, 2006 for the appellate court cases—reflects an attempt to compensate for the lag between filing a case and disposition of an appeal.

Thus, for each district court judge identified in the database described in Section II.A, the total number of patent cases handled was included. This information was broken down by year. Using the aggregate number of patent cases handled by each judge is not a perfect proxy for the number of patent claim constructions performed by a judge. Some cases may settle early, requiring little or no attention by a judge. Other patent cases may proceed for years and focus on issues unrelated to claim construction. Nevertheless, overall, the total number of patent cases handled by a particular judge is a useful surrogate for the number of cases in which the court performed claim construction.¹¹³

D. Limitations of the Databases

Notwithstanding the high validity and reliability of both the appellate and district court judge¹¹⁴ databases, there were several internal shortcomings for which the study was unable to account. Both databases are affected by the nature of litigation because the merits of the cases, the parties,¹¹⁵ and the parties' resources may not be spread equally across cases.¹¹⁶ There is reason to believe that forum shopping is another significant problem in patent litigation.¹¹⁷ For example, it may be the case that a particular judicial

112. For more information on how these data were collected, see Appendix A.4.

113. It was not feasible to review the PACER dockets in the 16,000-plus patent lawsuits to determine in which cases the claims had been construed.

114. Because the district court judge database consists only of objective information (the judge's birth year, size of docket provided by CourtLink, etc.), no formal measure of reliability is necessary. See Hall & Wright, *supra* note 97, at 112.

115. For a discussion of the frequency of patent litigation involving public companies across various industries, see JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE* 106–09 (2008).

116. John R. Allison & Mark A. Lemley, *Empirical Evidence On The Validity Of Litigated Patents*, 26 *AIPLA Q.J.* 185, 202–05, 250–51 (1998).

117. Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?*, 79 *N.C. L. REV.* 889, 924–31 (2001); Yan Leychikis, Note, *Of Fire Ants and Claim*

district hears more cases brought by entities that own a patent, do not produce any products, and only desire to settle the lawsuit for a licensing arrangement. Or, more patent disputes between Fortune 100 companies may be filed in a particular judicial district. Thus, it is highly likely that the types of parties involved are not randomly distributed throughout the judicial districts. The skewed distribution across judicial districts means that district court judges are not assigned a random sample of the total pool of patent lawsuits, because district court judges are assigned cases from the judicial district in which they sit.

The lack of random distribution of patent cases may be particularly profound if the types of parties to the lawsuits have some relationship to the difficulty or closeness of the claim construction issues. If, for example, lawsuits brought by non-practicing entities whose business goal is to license an entire industry¹¹⁸ are weaker suits, we would expect those cases to be easier for district court judges to resolve correctly. Thus, district court judges that hear a higher proportion of those cases would have inflated affirmance rates. In addition, different types of parties may be correlated with different appeal rates. For example, generic drug manufacturers or non-practicing entities may be more likely to appeal adverse decisions than parties in lawsuits with their competitors. A higher appeal rate of certain types of parties would magnify the effect of any selection bias.

The appellate database has additional limitations not applicable to the district court judge database. The appellate database by design consists only of appealed cases. Notwithstanding this fact, however, district court judges who supervise more patent cases have more opportunities to be appealed than district court judges who supervise fewer patent cases. Furthermore, the personalities of a particular judge or jury may cause a case to settle when that same case in front of a different judge or jury would proceed to an appeal. For example, some judges may pressure the parties to settle.¹¹⁹ Other judges may let a case languish in the hopes that it will settle.¹²⁰ Numerous district court cases proceeded through the resolution of claim construction, but were not appealed.¹²¹ The Federal Circuit has almost never granted inter-

Construction: An Empirical Study of the Meteoric Rise of the Eastern District of Texas as a Preeminent Forum for Patent Litigation, 9 YALE J.L. & TECH. 193 (2007).

118. Some have referred to non-practicing entities pejoratively as trolls. E.g., Raymond P. Niro, *Who is Really Undermining the Patent System—'Patent Trolls' or Congress?*, 6 J. MARSHALL REV. INTELL. PROP. L. 185 (2007).

119. Eric Herman, *Charting the yays and nays in federal court*, CHI. LAW., Mar. 1996, at 1, 10 (“[I]f [judges] have a really tough case, they can put tremendous pressure on the parties to settle so there won’t be an appealable order.” (quoting Judge Richard A. Posner)).

120. *Id.* (“One way not to get reversed is—don’t do anything. If you don’t do much, the parties will eventually settle the cases and you’re not reviewed.” (quoting an anonymous district court judge)).

121. Kesan & Ball, *supra* note 101, at 271–74; Arti K. Rai, *Engaging Facts and Policy: A Multi-Institutional Approach to Patent System Reform*, 103 COLUM. L. REV. 1035, 1059 (2003) (finding that twenty-nine percent of patent cases settle as a result of the district court’s claim construction); Patricia A. Martone, *Before the Actual Markman Hearing—Timing, Discovery and*

locutory review of a claim construction order.¹²² The appealed claim construction cases may be the cases involving closer calls.¹²³ Conversely, the appealed cases may be the ones in which the parties most strongly disagreed as to the correctness of the district court's claim construction.¹²⁴ If the litigants are deciding whether to appeal based in part on the identity of the district court judge, there may be a selection bias in the appellate database.¹²⁵ In most types of civil litigation cases, especially ones in which the district court judge is afforded some deference, it is reasonable to believe that litigants consider the expertise and reputation of the district court judge in deciding whether to appeal.

From a crosscheck on the data described in Appendix B, there is reason to believe that a slight selection bias exists. In other words, the cases in the appellate database may not be a random sample of the population of all claim construction cases. And the lack of randomness may be related to the variable-of-interest—the identity of the district court judge.

However, there are also reasons to believe that litigants do *not* rely upon the characteristics of the district court judge in evaluating appeal options in patent cases. The key issue here is the low cost of appeal relative to the overall stakes. The American Intellectual Property Law Association reports that the average cost of patent litigation in the district courts through the close of discovery (but not including the expense of trial) is \$5,000,000 for high damage cases and \$600,000 for lower damage cases.¹²⁶ The amount of potential damages in dispute is typically much higher than that. These financial dynamics urge parties toward appealing most cases without regard to the identity of the district court judge.¹²⁷ If this incentive outweighs the

Alternatives, 753 PLI/Pat 91, at 100 (2003) (noting that claim construction does not always affect settlement).

122. The author is only aware of a single case involving claim construction reviewed by the Federal Circuit in the past thirteen years before entry of an appealable judgment. *Regents of Univ. of Cal. v. Dako N. Am.*, 477 F.3d 1335 (Fed. Cir. 2007).

123. Moore, *Judges Equipped*, *supra* note 3, at 9–10; George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 4, 16 (1984); cf. Theodore Eisenberg, *Testing the Selection Effect: A New Theoretical Framework with Empirical Tests*, 19 J. LEGAL STUD. 337 (1990) (testing and rejecting the hypothesis that plaintiffs should prevail in fifty percent of tried cases). At least some empirical evidence of appellate reversal rates refutes the application of Priest and Klein's economic theory to appeals. See, e.g., Kevin M. Clermont & Theodore Eisenberg, *Litigation Realities*, 88 CORNELL L. REV. 119, 151 (2002). Further, other empirical studies of patent litigation have shown plaintiff win rates in jury trials at almost seventy percent, contrary to what one would expect using the economic theory. See, e.g., Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 385–86 (2000).

124. See, e.g., Moore, *Judges Equipped*, *supra* note 3, at 9–10.

125. For a discussion of the potential for a selection bias in the evaluation of only appellate decisions, see Petherbridge & Wagner, *supra* note 107, at 2071.

126. AM. INTELLECTUAL PROP. LAW ASS'N, REPORT OF THE ECONOMY SURVEY 2007, at 25 (2007). This figure does not include the substantial non-monetary costs of patent litigation. See Matthew Sag & Kurt Rohde, *Patent Reform and Differential Impact*, 8 MINN. J. L. SCI. & TECH. 1, 29–30 (2007).

127. Patent cases are roughly five times more likely to be appealed than other civil lawsuits. Paul R. Michel, *The Court of Appeals for the Federal Circuit Must Evolve to Meet the Challenges*

countervailing personality-based incentive, then there may not be a selection bias that affects results of the present study.

The urge to appeal any final judgment is reinforced by the *de novo* review standard of claim construction and the widespread knowledge that the Federal Circuit reverses on claim construction quite frequently.¹²⁸ Thus, regardless of the district court judge's experience or reputation for patent expertise, litigants may appeal an adverse decision on claim construction. Nevertheless, to be cautious in light of the potential bias in the dataset, this Article primarily uses descriptive statistics about the appellate database and the patterns of activity with respect to district court judges. To the extent other statistics or inferences from the data are presented in this Article, they are always subject to the limitations discussed in this Section.

Finally, this study treats the Federal Circuit as a single, static court. The panel makeup of the appellate decisions was not considered. As discussed in Part IV, this assumption may not hold.¹²⁹ Also, for parts of the analysis, the applicable law on claim construction was assumed to be steady and uniform.

The district court judge database is also limited in two main respects. First, the database includes all patent lawsuits in the designated time period, regardless of how far each suit progressed. It is not limited to lawsuits in which claim construction was decided by the district court judge. Second, the district court judge database is limited by PACER and CourtLink and the accuracy of their respective data collection methods. PACER's records may be less accurate than Westlaw or LexisNexis and apparently have some inaccuracies as to what is counted as a patent case.¹³⁰ Still, the aggregate number of patent cases obtained from PACER is sufficiently accurate for the limited purposes of this study.

Ahead, 48 AM. U. L. REV. 1177, 1193 (1999). Once the appeal has been filed, very few patent cases are settled. See U.S. Court of Appeals for the Fed. Circuit, Merit and Non-Merit Dispositions for Appeals in Patent Infringement Cases: April 2007 through March 2008, <http://www.cafc.uscourts.gov/pdf/PatentDispositionsChartApr07-Mar08.pdf> (last visited Oct. 11, 2008) (documenting a mere thirteen percent settlement rate in patent infringement appeals from April 2007–March 2008).

128. For an interesting model of how firms decide whether to litigate or settle a patent dispute, see Sag & Rohde, *supra* note 126, at 73–91.

129. It is still disputed whether the Federal Circuit decisions are inflicted by a panel effect. Compare Wagner & Petherbridge, *supra* note 4, at 1158–61 (asserting that Federal Circuit judges use different methodologies in approaching claim construction and that which judges sit on the panel affects the results), with John R. Allison & Mark A. Lemley, *How Federal Circuit Judges Vote in Patent Validity Cases*, 27 FLA. ST. U. L. REV. 745 (2000) (noting that the voting patterns of the Federal Circuit judges on validity were quite similar).

130. The plaintiff to a lawsuit can mark only one box to describe the nature of the lawsuit, regardless of how many different causes of action are asserted. In addition to the problems of over inclusion and under inclusion, this also may slightly affect the data. See Admin. Office of the U.S. Courts, Form JS 44: Civil Cover Sheet (Mar. 1999), available at <http://www.uscourts.gov/forms/JS044.pdf>.

III. RESULTS AND DISCUSSION

Part III sets forth the results of the present study. Section III.A provides a summary of the overall results. Section III.B discusses the impact of prior appeals on the reversal rate of a judge's claim constructions. Finally, Section III.C analyzes the effect of a district court judge's experience on his or her claim construction reversal rate.

A. Basic Results on Judicial Districts and District Court Judges

The entire federal judiciary currently includes 678 authorized active district court judgeships.¹³¹ The number of district court judges actually sitting at any given time is higher because the 678 authorized judgeships do not include judges who have taken senior status.¹³² Each district court serves in a geographically limited judicial district. Across the country, there are ninety-four separate judicial districts. While patent litigation occurs in all judicial districts, the cases are not evenly distributed. Judicial districts such as the District of Delaware, the Central District of California, and the Northern District of California have attracted, for one reason or another, a larger share of patent litigation than the average.¹³³ Even assuming a random assignment of cases within a judicial district,¹³⁴ patent litigation is distributed unequally among the district court judges as a result of the unequal distribution of patent litigation across the judicial districts. In general, district court judges in districts with more patent litigation oversee more patent cases.

The 485 district court and magistrate judges analyzed in this study reside in seventy-seven separate judicial districts. Thus, seventeen judicial districts did not have a claim construction appeal during the time frame of the study. Table 2 below identifies the number of Federal Circuit appeals from the most active judicial districts in terms of claim construction appellate decisions from April 1996 until June 2007. It also provides the percentage of cases that were reversed, vacated, and/or remanded due to an erroneous claim construction.

131. Federal Judicial Center, *How the Federal Courts Are Organized: Federal Judges and How They Get Appointed*, <http://www.fjc.gov/federal/courts.nsf> (follow "How The Federal Courts Are Organized" hyperlink; then follow "Federal Judges and How They Get Appointed" hyperlink) (last visited Aug. 14, 2008).

132. See JAMES C. DUFF, *JUDICIAL BUSINESS OF THE UNITED STATES COURTS: 2007 ANNUAL REPORT OF THE DIRECTOR* 42 tbl.11 (2007), available at <http://www.uscourts.gov/judbus2007/JudicialBusinesspdfversion.pdf>.

133. Moore, *supra* note 117, at 903–04. Much more recently, the Eastern District of Texas has become a favorite venue for patent litigation. Leychkis, *supra* note 117.

134. Although judge assignment methods vary district by district, all districts are required to make assignments that assure an equitable distribution of caseloads and avoid judge shopping. The majority of courts use some form of a random drawing. The Federal Judiciary: Frequently Asked Questions, <http://www.uscourts.gov/faq.html> (last visited Aug. 14, 2008).

TABLE 2
 MOST ACTIVE JUDICIAL DISTRICTS: 1996–2007

Rank	Judicial District	Number of Federal Circuit Claim Construction Appeals (1996–2007)	Percentage of Claim Construction Appeals Reversed, Vacated and/or remanded because of Claim Construction Error	Number of Patent Lawsuits Filed (1995–2005) ¹³⁵ (rank)
1	N.D. Cal.	84	28.6%	2613 (1)
2	C.D. Cal.	69	43.5%	2260 (2)
3	N.D. Ill.	65	26.2%	1509 (3)
4	D. Del.	54	22.2%	1112 (5)
5	S.D.N.Y.	45	26.7%	1184 (4)
6	D. Mass.	42	23.8%	782 (7)
7	D. Minn.	33	36.4%	743 (8)
8	E.D. Mich.	29	31.0%	669 (9)
9	D.N.J.	28	32.1%	952 (6)
10	E.D. Va.	27	22.2%	555 (14)
11	N.D. Tex.	21	42.9%	591 (11)
11	S.D. Tex.	21	23.8%	466 (19)
13	W.D. Wisc.	19	21.1%	232 (36)
14	W.D. Wash.	18	38.9%	475 (17)
14	D. Col.	18	27.8%	407 (23)

As is evident from Table 2, several of the busiest districts have reversal rates above thirty percent.¹³⁶ In fact, the second busiest district in the country as measured by either number of appeals or number of patent lawsuits handled, the Central District of California, has the highest reversal rate of claim construction.¹³⁷

A total of 485 distinct trial court judges had decisions reviewed by the Federal Circuit on the issue of claim construction. This number includes

135. Data obtained through a search of Judicial Strategic Profile in LexisNexis CourtLink, limited to Patent in the Nature of Suit field.

136. The Eastern District of Texas has more recently become a common venue for patent litigation. See Roderick R. McKelvie, *Forum Selection in Patent Litigation: A Traffic Report*, 19 INTELL. PROP. & TECH. L.J., Aug. 2007, at 1, 2 (noting that the Eastern District of Texas was the second-most-popular venue for patent litigation in 2006). Because this trend has begun fairly recently, many of the cases from the Eastern District of Texas have not had time to proceed through appeal. See *id.* (presenting evidence that the number of lawsuits filed in the Eastern District of Texas increased by eight-fold from 2001 to 2006). Consequently, the Eastern District of Texas is not one of the top fifteen districts in terms of appellate claim construction experience during the period from 1996 to 2007.

137. The Federal Circuit reversed, vacated, and/or remanded 43.5% of appeals of cases from the Central District of California.

thirty-two magistrate judges who, apparently by consent of the parties, handled cases without oversight by a district court judge.¹³⁸ Thus, after adjusting for the magistrate judges, there were 453 district court judges who had an issue of claim construction appealed. Figure 1 depicts the distribution of district court judges on claim construction appeals.

FIGURE 1
HISTOGRAM—DISTRIBUTION OF DECISIONS IN APPELLATE DATABASE

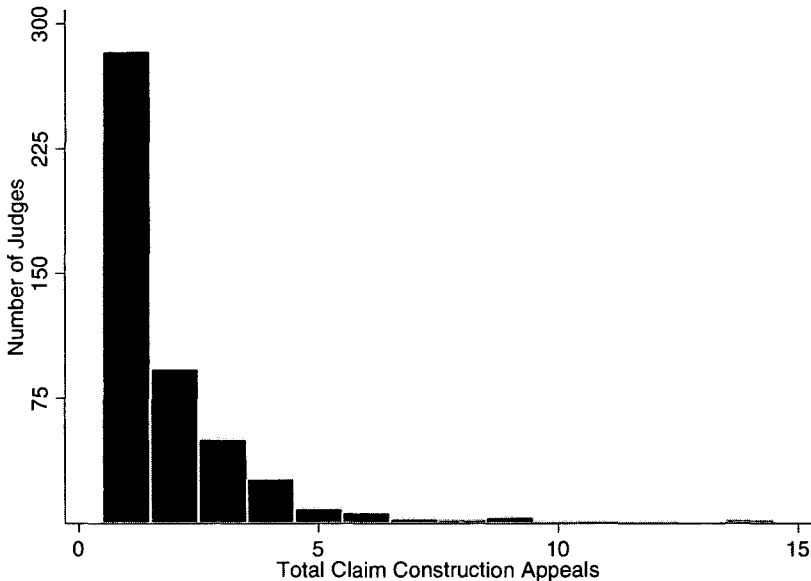


Figure 1 shows that the data is skewed heavily to the left, meaning that most of the judges had one or two patent appeals. Thirty judges had five or more patent appeals.

One note about the data: except as specified in Appendix B.3 below, the precise timing of the prior appeals was not taken into account. For example, occasionally two appeals of a particular district court judges' decisions were decided by the Federal Circuit in the same year. In those circumstances, the district court judge likely did not have the benefit of feedback from the Federal Circuit before entering final judgment in the second case. This was the

138. According to the U.S. Courts:

A U.S. magistrate judge is a judicial officer of the district court and is appointed by majority vote of the active district judges of the court to exercise jurisdiction over matters assigned by statute as well as those delegated by the district judges. . . . A full-time magistrate judge serves a term of eight years.

exception and not the rule, and it typically occurred with the busiest patent judges, who had the largest number of appeals.¹³⁹

Summary data for the district court judges (excluding the magistrate judges) appears in Table 3 below.

TABLE 3
SUMMARY INFORMATION ON THE DISTRICT COURT JUDGES
IN THE APPELLATE DATABASE

Maximum number of appeals	14
Minimum number of appeals	1
Mean number of appeals	2.32
Standard deviation	2.08

The 453 district court judges had an average of between two and three Federal Circuit claim construction appeals during the relevant time period. Despite the skew of the data, the average number of appeals is not insignificant. The highest number of appeals of any district court judge was fourteen, and the lowest was one. Judges without any claim construction appeals (there were many) were not included in the database. As discussed above in Part II, the database was generated from the Federal Circuit claim construction appeal records, not the records of the district court. By definition, if a district court judge is in the database, he or she has had at least one claim construction appeal.

The data in the appellate database was used to determine the overall reversal rates. Including all of the data from the date of *Markman* until June 30, 2007, 32.5% of the terms were “wrongly” construed by the lower court.¹⁴⁰ Also, 38.2% of cases had at least one term wrongly construed.

139. Less than nineteen percent of decisions were ones in which the same district court judge was reviewed twice in a single calendar year.

140. This metric of evaluating the reversal rate is difficult to compare across cases. The Federal Circuit is inconsistent in how many construed terms it will review on appeal because some panels of the Federal Circuit will stop all claim construction analysis after finding a single claim element properly construed and missing from the accused device. Other panels will analyze and review all claim constructions on appeal. The result of the differences between Federal Circuit panels is that the same effort and construction by two district courts may result in different reversal counts if the focus is on claim terms. Take as an example a case in which the district court construes three disputed claim terms and finds all three missing from the accused infringer’s products. The patentee appeals a grant of summary judgment of non-infringement to the Federal Circuit. The Federal Circuit may respond on appeal in several ways. First, the Federal Circuit may analyze only one element, find the district court was correct, affirm, and decline to review the other two terms. Alternatively, the Federal Circuit may review all three elements, finding one to be correctly construed and the other two incorrectly construed. In this case it will still affirm the district court because at least one term was missing from the accused device. Yet another possible result on appeal is review of all of the terms and finding all three terms correctly construed. In all three events, the

Moreover, 29.7% of the cases had to be reversed, vacated, and/or remanded because of an erroneous claim construction.¹⁴¹ Excluding the thirty-two magistrate judges, 32.0% of the terms were wrongly construed by the district court, 38.0% of cases included at least one wrongly construed term, and 29.7% of the cases had to be reversed, vacated, and/or remanded due to an erroneous claim construction. Table 4 below summarizes these results for the district court judges.

TABLE 4
CLAIM CONSTRUCTION REVERSAL RATES: 1996-2007

Cases with at least wrongly one construed term	38.0%
Cases that were reversed, vacated, and/or remanded due to a claim construction error	29.7%
Terms wrongly construed	32.0%

As a point of reference, the Federal Circuit's overall reversal rate of district court judgments (which are over 95% patent cases)¹⁴² was 13% for each of the years 2004, 2005, and 2006.¹⁴³ Because there did not seem to be a significant difference between the performance of magistrate judges and district court judges, this Article excludes magistrate judges from the

district court's overall evaluation of the case was correct. However, the difference between the second and third decision is profound when the reversal rate by claim term is analyzed. Because many panels use the first method of reviewing terms, which entails stopping after finding one term to affirm, one cannot tell which of the cases should be in the second or the third category.

141. A case was categorized as "reversed" if, as a result of an improper claim construction, the district court was reversed, vacated, and/or remanded as to any accused product or patent claim. The "reversed, vacated, and/or remanded" category and the "at least one term wrongly construed" category have a significant difference. Specifically, the latter includes harmless errors. While these errors were harmless for the patentee vis-à-vis the accused infringer at issue, the corrected claim construction may be material for others in the industry.

A better measure of the reversal rate is the number of decisions that had to be reversed, vacated, and/or remanded due to an erroneous claim construction. If the case is remanded, a judge must redo the case after utilizing the correct claim construction. If the case is affirmed despite an erroneous claim construction, the district court judge may pay less attention to the appellate decision. Other items, such as such as the technology at issue, may affect the reversal rate of the district court judge.

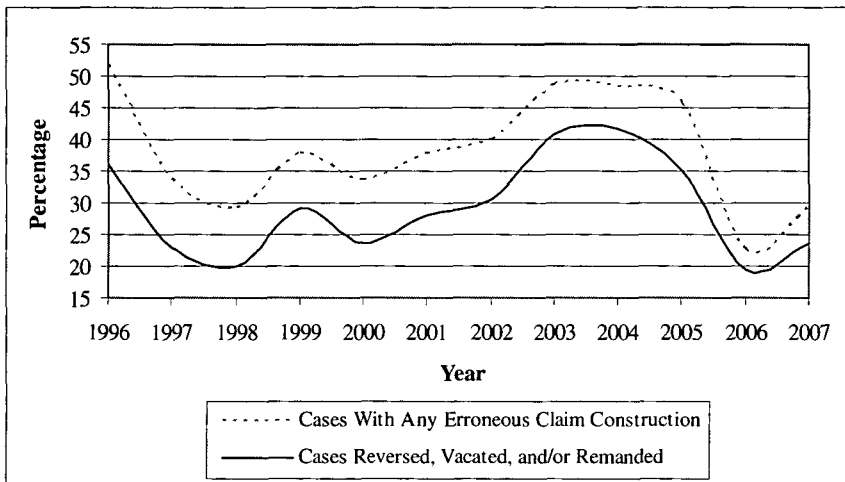
142. The Federal Circuit also has jurisdiction over non-patent cases, the most significant of which are cases that arise under the Little Tucker Act. 28 U.S.C. § 1295 (2006). A search of the LexisNexis "CAFC" database reveals that, from 2004 to 2006, 769 of Federal Circuit cases dealt with patent law, while twenty dealt with the Little Tucker Act.

143. STATISTICS DIV., ADMIN. OFFICE OF THE U.S. COURTS, 2004 JUDICIAL BUSINESS OF THE UNITED STATES COURTS 117 tbl.B-8 (2004), available at <http://www.uscourts.gov/judbus2004/appendices/b8.pdf>; STATISTICS DIV., ADMIN. OFFICE OF THE U.S. COURTS, 2005 JUDICIAL BUSINESS OF THE UNITED STATES COURTS 143 tbl.B-8 (2005), available at <http://www.uscourts.gov/judbus2005/appendices/b8.pdf>; STATISTICS DIV., ADMIN. OFFICE OF THE U.S. COURTS, 2006 JUDICIAL BUSINESS OF THE UNITED STATES COURTS 147 tbl.B-8 (2006), available at <http://www.uscourts.gov/judbus2006/appendices/b8.pdf>.

remainder of its analysis. Because of the small number of magistrate judge cases compared to the overall number of cases, inclusion or exclusion of the magistrate judges does not meaningfully affect the results. Furthermore, the magistrate judges' overall results were in line with those of the district court judges. For example, magistrate judges had 31.6% of their cases reversed, vacated, and/or remanded because of an erroneous claim construction, and 44.7% of their cases had at least one erroneously construed claim term.¹⁴⁴

As Figure 2 demonstrates, the reversal rate has not been constant over time.

FIGURE 2
CLAIM CONSTRUCTION REVERSAL RATES OVER TIME



The lower line depicted in Figure 2 is the reversal rate based on cases that were reversed, vacated, and/or remanded due to a claim construction error. The upper line is the rate of cases with any erroneous claim constructions. Both reversal rates have fluctuated over time with the percentage of cases which had to be reversed, vacated, and/or remanded, ranging from a high of 41.6% in 2004 to a low of 19.4% in 2006. For the first half of 2007, it bumped up to 23.5%. For cases with any erroneous claim constructions, the high reversal rate was 48.7% in 2003 (and 52.0% in 1996, a partial year of data) and the low was 22.4% in 2006.

144. Many of the metrics used to evaluate district court judges could not be used to evaluate magistrate judges. For example, the number of patent lawsuits assigned to a magistrate judge would be biased relative to the number for district court judges. It is common for magistrate judges to be assigned to a patent case and participate in discovery only, with no role in claim construction. Martone, *supra* note 121, at 155. Counting each lawsuit a magistrate judge was assigned as equal to each one a district court judge was assigned would not yield useful results.

B. *The Impact of Previous Appeals*

In this Section, the Article analyzes the performance of district court judges after being reviewed by the Federal Circuit. This Section first investigates the reversal rate of judges based first upon their number of previous appeals, and second as a function of their first reversal by the Federal Circuit.

1. *Performance Based upon Number of Previous Appeals*

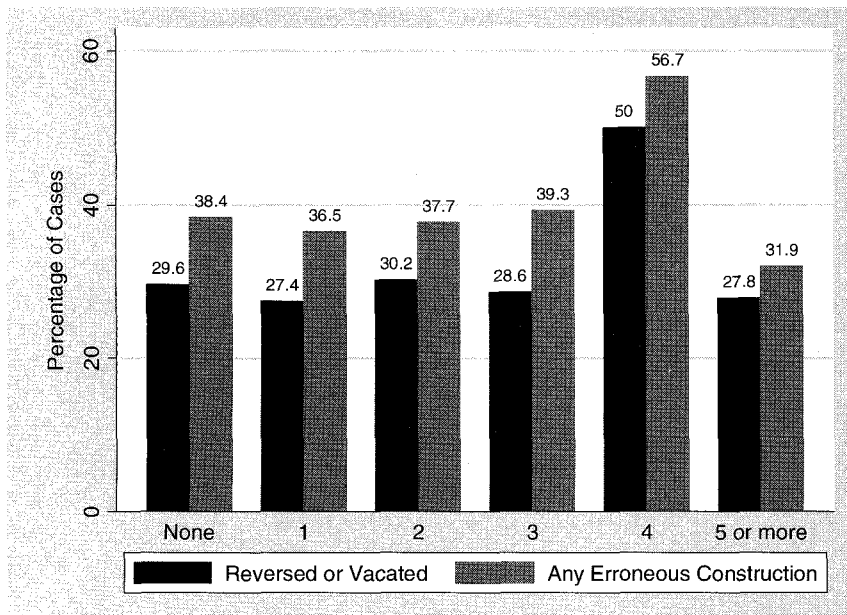
If district court judges improve after appellate review of claim construction, one would expect that the reversal rate would decrease as the number of appeals increases, assuming the appealed cases are a representative sample of litigated cases.¹⁴⁵ More specifically, a district court judge with more prior Federal Circuit feedback should have a lower reversal rate than a district court judge with less experience. Assuming that the judge decided the second case after learning of the decision of the Federal Circuit in the prior case, the second time a particular judge's decision is before the Federal Circuit, he or she should be more likely to have his or her claim construction affirmed.¹⁴⁶ Judges may pay substantially more attention to decisions regarding their own opinions than they pay to run-of-the-mill Federal Circuit decisions. The learning curve should continue, perhaps less rapidly after several appeals, and at some point it should level off.

Figure 3 below illustrates the actual reversal rates of district court judges broken down by the number of prior claim construction appeals.

145. Joseph L. Smith, *Patterns and Consequences of Judicial Reversals: Theoretical Considerations and Data from a District Court*, 27 JUST. SYS. J. 28 (2006) (finding empirical support for the proposition that judges react to reversals by predictably changing their decision-making patterns).

146. Reversal rates are one possible way to measure judicial performance. RICHARD A. POSNER, *HOW JUDGES THINK* 131 (2008); cf. Jeffrey A. Lefstin, *The Measure of the Doubt: Dissent, Indeterminacy, and Interpretation at the Federal Circuit*, 58 HASTINGS L.J. 1025, 1032 (2007) (arguing that appellate dissents are a better indicator than reversals to measure "indeterminacy").

FIGURE 3
REVERSAL RATE BASED UPON NUMBER OF PREVIOUS APPEALS



The left-most pair of bars represents the results from every judge's first appeal, with the first bar in each pair indicating the percentage of cases that had to be reversed, vacated, and/or remanded due to an incorrect claim construction, and the second bar indicating the percentage of cases with any erroneous claim construction. Moving to the right, these bars represent the results from each judge's subsequent appeals.

Based upon these results, there does not appear to be a clear trend that the reversal rate decreases when a district court judge appears multiple times before the Federal Circuit on claim construction.¹⁴⁷ In fact, the highest reversal rate is for judges with four prior claim construction appeals. Other than judges who have been appealed exactly four times, the range is very narrow, between 27.4% and 30.5% for reversals and 31.9% and 39.3% for errors.¹⁴⁸

147. Appendix B provides a further dissection of the data based upon prior appeals. More specifically, the data shows that the Federal Circuit decides cases under Rule 36 without a strong regard to the experience of the district court judges. Thus, the reversal rate based upon experience does not appear to be caused by a selection bias in terms of whether a decision is resolved through Rule 36.

148. Summarizing the figure, 29.6%, 27.4%, 30.2%, 28.6%, 50.0%, and 27.8% of the cases were reversed, vacated, and/or remanded due to claim construction for district court judges with zero, one, two, three, four, and five or more previous claim construction appeals, respectively. Figure 3 also shows that 38.4%, 36.5%, 37.7%, 39.3%, 56.7%, and 31.9% of cases had at least one erroneous claim construction for judges with zero, one, two, three, four, and five or more previous claim construction appeals, respectively. The n (number of cases) for each bar was 453, 197, 106, 56, 30, and 72, respectively.

Thus, there does not appear to be any expertise gained by district courts that causes the claim construction reversal rate to decrease.¹⁴⁹

2. Performance After First Reversal

Another way to analyze the data is to see how district court judges have performed in cases subsequent to their first *reversal*. It may be that a district court judge pays little attention if his or her opinion was affirmed but that he or she takes note if the result of the case was affected. Remanded cases are often returned to the same district court judges for further proceedings. The district court judge likely will remember the opinion remanding the time-consuming patent lawsuit to his or her docket. Figure 4 below illustrates the reversal rate after a particular district court judge has been reversed, vacated, and/or remanded at least once due to an erroneous claim construction.

149. The null hypothesis that the percentages in each group are the same cannot be rejected. A *chi-square* test was performed on the number of cases that were affirmed and that had to be reversed, vacated and/or remanded due to erroneous claim constructions in the six categories (no previous appeals, one previous appeals, two previous appeals, three previous appeals, four previous appeals, and five or more previous appeals). The p-value measures the confidence level at which a hypothesis can be rejected. A p-value of 0.05 or less signifies that the hypothesis can be rejected with a 95% confidence level. Here, the p-value was 0.252, which is greater than the 0.05 expected p-value for a 95% confidence level. Consequently, the hypothesis—that there are no differences between the groups—cannot be rejected. As previously mentioned, all inferences from the data are subject to the limitations of the study described in Section II.D.

FIGURE 4
REVERSAL RATE BASED UPON NUMBER OF CASES
AFTER FIRST REVERSAL

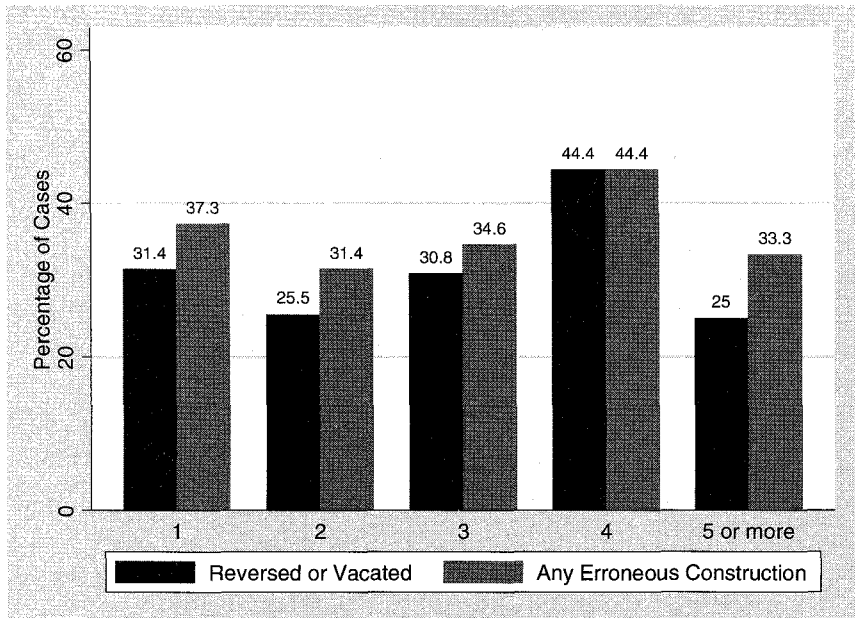


Figure 4 shows that the first reversal does not have a substantive or statistically significant effect on the future performance of the district court judge, with the rate varying from 25.5% to 44.4% for reversals, and from 31.4% to 44.4% for errors.¹⁵⁰ The percentages in this breakdown vary to a greater degree than the percentages based upon number of prior appeals. The trend is not linear, and the differences in the reversal rates are not statistically significant.¹⁵¹ Thus, it does not appear that district court judges improve their claim construction accuracy after their first reversal from the Federal Circuit.

C. The District Court Judges with Experience

In the Sections that follow, this Article presents the data analyzed for several variables that relate to experience of the district court judge. These variables include age, judicial experience, and patent experience of the district court judge. Analysis based upon additional measures of experience,

150. More precisely, 31.4%, 25.5%, 30.8%, 44.4%, and 25.0% of cases were reversed, vacated, and/or remanded for zero, one, two, three, four, and five or more appeals after first reversal, respectively. Figure 4 also shows that the percentage of cases with any erroneous claim construction was 37.3%, 31.4%, 34.6%, 44.4%, and 33.3%, respectively. The *n* (number of cases) for each bar was 102, 51, 26, 18, and 36, respectively.

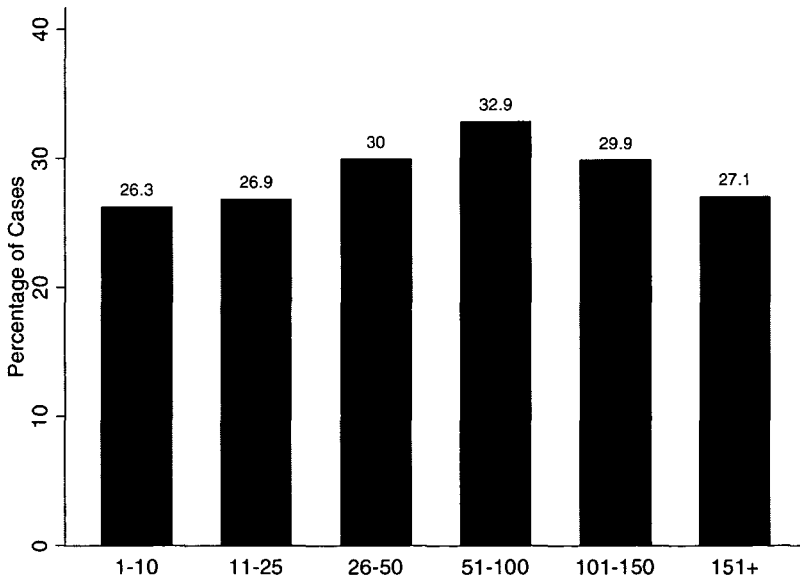
151. The null hypothesis that the percentages in each group are the same cannot be rejected. The *chi-square* test *p*-value was 0.591, greater than the expected *p*-value for a 95% confidence level.

including the length of time since a district court judge's first review on appeal, can be found in Appendix B. It should be noted that the present study does not include any multivariate analysis.¹⁵²

1. Judges with the Most Patent Experience

Using the district court judge database, the total number of patent lawsuits a district court judge was assigned was compared to the number of patent appeals. It is important to remember that this comparison is not perfect: the appellate database contains decisions, while the district court judge database contains lawsuits. The district court judge database is not limited to cases in which claim construction was performed by the judge or even at issue. Figure 5 below shows the reversal rate (as measured by cases in which an incorrect claim construction required the case to be reversed, vacated, and/or remanded) based upon the number of patent lawsuits a district court judge was assigned.

FIGURE 5
REVERSAL RATE BASED UPON TOTAL NUMBER OF
PATENT LAWSUITS HANDLED



152. A variable such as age may appear to be unimportant because another variable is concealing its affect on claim construction. Multivariate analysis would permit one to control for other variables.

Figure 5 shows that the claim construction reversal rate varies little with the total number of patent lawsuits handled.¹⁵³ The reversal rate was between 26.3% and 32.9%.¹⁵⁴ Consequently, it does not appear that district judges' reversal rates decrease as they handle more patent cases.¹⁵⁵

2. Judges with the Most Overall Judicial Experience

Another logical hypothesis is that claim construction reversal rates should decrease the longer a judge has been on the bench. Using the appellate and district court judge databases, the reversal rate on appeal was derived based on the judicial experience of the district court judge. For each appellate decision, experience is operationalized as the number of years of federal judicial experience of the district court judge at the time of the Federal Circuit decision. For example, if a judge was appointed in 1996, a Federal Circuit decision in 1999 would be identified as three years' experience, while a decision in 2003 by the same judge would count as seven years' experience. Figure 6 below shows a trailing three-year moving average of the reversal rate based upon judicial experience.¹⁵⁶ As shown in Figure 6 below, the trend appears to be downward from about four to six years of experience until about twenty years of experience, consistent with the hypothesis. Thereafter, the reversal rate increases. Thus, there may be a relationship between overall judicial experience (as measured by years on the bench) and the quality of a district court judge's patent decision-making (as measured by Federal Circuit claim construction reversal).¹⁵⁷ The judges with twenty years or more of experience presided on the bench before the creation of the Federal Circuit. Perhaps this pre-Federal Circuit experience adversely affects these district court judges' respect or awareness of Federal Circuit case law.

153. The data illustrated in Figure 5 does not adjust over time the number of patent cases handled by a particular district court judge. For example, a district court judge that has handled 300 patent cases is grouped in the 300 category for all of the appeals of his or her decisions.

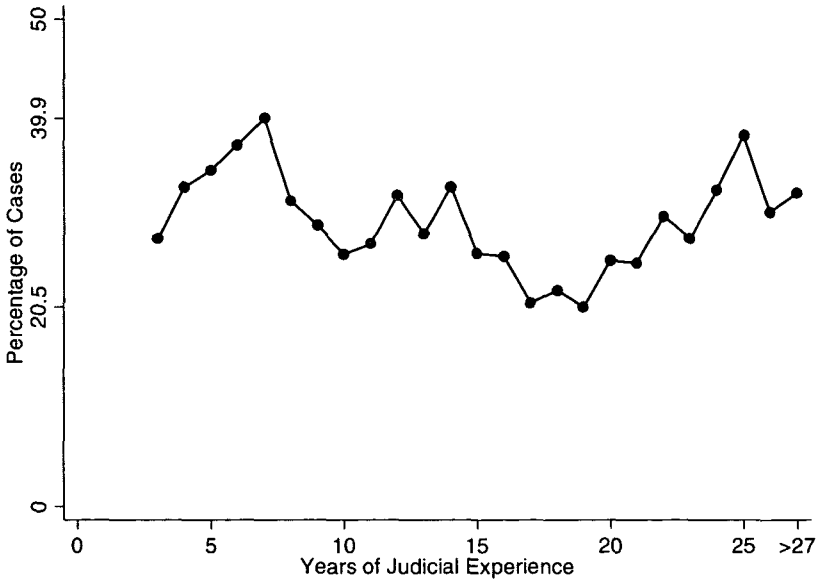
154. The percentage of cases reversed is 26.3%, 26.9%, 30.0%, 32.9%, 29.9%, and 27.1% for judges with 1–10 cases, 11–25 cases, 26–50 cases, 51–100 cases, 101–150 cases, and more than 151 cases, respectively. The number of cases in each group was 99, 167, 290, 210, 97, and 48, respectively. The number of judges in each group was 91, 114, 153, 69, 19, and 5, respectively. CourtLink inexplicably identified a few judges with zero patent cases. These judges were excluded from Figure 5.

155. The null hypothesis that the percentages in each group are the same cannot be rejected. The *chi-square* test p-value was 0.801, which is greater than the expected p-value for a 95% confidence level.

156. The three-year "trail" is the average of the three years that precede the given year. For example, the three-year trailing average of fifteen years' experience is the number of cases reversed that were handled by judges with thirteen, fourteen, and fifteen years' experience divided by the total number of cases appealed from judges with thirteen, fourteen, and fifteen years' experience. Using a trailing average reduces noise since there are so many discrete years of judicial experience.

157. The null hypothesis that the percentages in each group are the same cannot be rejected. The *chi-square* test p-value was 0.105, which is greater than the expected p-value for a 95% confidence level.

FIGURE 6
MOVING AVERAGE OF REVERSAL RATE BASED
UPON JUDICIAL EXPERIENCE



3. The Age of Judges

There are two possible theories regarding the effect of the judge's age on the claim construction reversal rate. One theory is that technology is the domain of the young and that consequently older judges should fare worse on patent cases. Some medical research suggests that the minds of adults over age sixty operate differently.¹⁵⁸ Another hypothesis is that older judges have more life and legal experience and that more experience should result in a lower reversal rate. Using the appellate and district court databases, the reversal rate on appeal was calculated based upon the age of the district court judge. For each appellate decision, the age of the district court judge at the time of the Federal Circuit decision was determined. Figure 7 below shows a trailing three-year moving average of the reversal rate based upon age of the district court judge.

158. See, e.g., Patricia A. Reuter-Lorenz & Cindy Lustig, *Brain Aging: Reorganizing Discoveries About the Aging Mind*, 15 CURRENT OPINION IN NEUROBIOLOGY 245 (2005); cf. Sara Reistad-Long, *Older Brain Really May Be a Wiser Brain*, N.Y. TIMES, May 20, 2008, at F5 (stating that research has found that while the aging brain may take longer to remember items, it "is simply taking in more data and trying to sift through a clutter of information, often to its long-term benefit").

FIGURE 7
MOVING AVERAGE OF REVERSAL RATE BASED UPON AGE



As shown in Figure 7 above, the trend appears to be a general decrease in reversal rates until the district court judge is seventy years old. Thereafter, the reversal rate spikes to nearly thirty-five or forty percent. The data begin to thin out around the age of seventy-five, which may explain the results.¹⁵⁹ An alternative explanation is that judges aged seventy or older are more likely to have taken senior status, and that senior status affects claim construction accuracy. Thus, there may be a relationship between age of the district court judge and the quality of a district court judge's patent decision-making (as measured by Federal Circuit claim construction reversal).¹⁶⁰

IV. ANALYSIS AND EXISTING SOLUTIONS

The study reveals the possibility of a severe flaw in the functioning of the U.S. court system relating to patents.¹⁶¹ There is no compelling evidence

159. The number of decisions for judges in the age groups of forty to forty-nine years old, fifty to fifty-nine years old, sixty to sixty-nine years old, seventy to seventy-nine years old, eighty to eighty-nine years old, and ninety to ninety-eight years old were 72, 358, 298, 143, 40, and 4, respectively.

160. The null hypothesis that the percentages in each group are the same cannot be rejected. The *chi-square* test p-value was 0.530, which is greater than the expected p-value for a 95% confidence level.

161. While a 30-40% reversal rate appears quite high, this Article does not show that the claim construction reversal rate is high relative to the reversal rates in other complex areas of law.

that trial court judges are improving with experience on claim construction.¹⁶² And if trial court judges are not improving, then either our current district court judges cannot learn how to construe patent claims properly or the appellate court has failed to teach the claim construction skill to district court judges.¹⁶³ A breakdown in the patent system's presumed teaching-learning dynamic has profound effects on that system and the legal system more generally. As trial court judges become aware of the seemingly unshakable reversal rate, they may become more complacent in their analysis and opinions. They may elect to resolve cases early—such as by summary judgment—in order to speed the cases toward their final resolution. The *de novo* standard of review further decreases the incentives for trial court judges to learn. Why should trial court judges try to learn if they will be reversed at a high rate and afforded little deference at any rate?

Other possible explanations for the results of the present study are that claim construction is inherently indeterminate, or that the assumption underlying the study—that the Federal Circuit's claim construction is correct—is flawed.¹⁶⁴ This Section briefly discusses these theories and various possible solutions. This Section also analyzes the current proposal to create quasi-specialized patent trial judges, questions the conventional justification for the proposal, and notes that further study is warranted.

A. Claim Construction Indeterminacy

Claim construction may be inherently indeterminate.¹⁶⁵ Indeterminacy results because there is often no common understanding of the claim terms through definition or through a clear understanding of the legal standards.¹⁶⁶ The words in patent claims have no clear meaning in the abstract,¹⁶⁷ and it is

See Lefstin, *supra* note 2, at 1038–39. Nor does this Article address the reason for the “high” reversal rate in claim construction. Rather, this Article addresses why district court judges do not appear to improve at claim construction as they hear more cases.

162. The Federal Circuit's decision in *Phillips* may have corrected this problem. However, *Phillips* was decided in 2005—relatively recently. As more cases are resolved by the district courts post-*Phillips* and are subsequently appealed, the effect of *Phillips* can be more fully explored.

163. District court judges have a strong incentive to learn, because they do not enjoy being reversed. POSNER, *supra* note 146, at 141; Evan H. Caminker, *Precedent and Prediction: The Forward-Looking Aspects of Inferior Court Decisionmaking*, 73 TEX. L. REV. 1, 77–78 (1994).

164. Yet another possible explanation is that the abilities of counsel for the litigants have improved over time. The improvement may be at either the trial-court level or the appellate-court level, or both. This possible explanation is not considered in this Article.

165. Lefstin, *supra* note 146, at 1030; S. Jay Plager, *Challenges for Intellectual Property Law in the Twenty-First Century: Indeterminacy and Other Problems*, 2001 U. ILL. L. REV. 69, 71–72; *see also* Improving Federal Court Adjudication of Patent Cases: Hearing Before the Subcomm. on Courts, the Internet, and Intellectual Property of the H. Comm. on the Judiciary, 109th Cong. 57 (2005) (statement of the Honorable T.S. Ellis, III) (noting that claim construction is difficult because of the “vagaries of language”); O'Malley et al., *supra* note 7, at 676 (“Often when I get to claim construction . . . I see a couple of reasonable interpretations.”).

166. *See, e.g.*, H.L.A. HART, THE CONCEPT OF LAW 131–34 (2d ed. 1994).

167. *Id.*

rare that these terms are expressly defined in the patent application.¹⁶⁸ Any search for a concrete meaning of those patent claims will be unsatisfying. No matter what, there will always be multiple plausible claim definitions for terms. Further, the Patent Office requires that claims must be drafted in an archaic format as a single sentence, regardless of the number of clauses or concepts.¹⁶⁹ Whatever the standards or canons, there will be uncertainty and indeterminacy as to which claim definition is proper.

Further, the indeterminacy problem is compounded because the court cannot interpret claim language using its own reasonable judgment. Rather, the court must engage in a legal fiction and construe the claims as a person having ordinary skill in the art would understand them.¹⁷⁰ This analysis must be conducted retrospectively, looking not at the meaning of the terms at the time of the decision, but instead at a time many years earlier—the time that the original patent application was filed with the Patent Office.¹⁷¹ Both of these factors—construing claims from a fictional perspective and construing claims retrospectively—enhance the indeterminate nature of claim construction. Thus, it will never be possible to have complete certainty in claim construction.

B. Possible Solutions at the Trial-Court Level

Judges may not be capable of adequately performing claim construction. The issues in a typical patent case may be so complex that legal minds without a background in science cannot appropriately resolve them.¹⁷² A judge needs to understand the core technology to interpret claim terms properly.¹⁷³ Various judges have acknowledged that deciding patent law issues is extremely difficult without fully understanding the underlying technology.¹⁷⁴ Thus, the technology itself may be insurmountable for

168. Even if the terms were expressly defined in the patent, the words used to define the claim terms may still need to be interpreted.

169. U.S. PATENT & TRADEMARK OFFICE, U.S. DEP'T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 608.01(m) (8th ed. rev. 2007).

170. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc).

171. See e.g., Gregory N. Mandel, *The Non-Obvious Problem: How the Indeterminate Non-Obvious Standard Produces Excessive Patent Grants*, 42 U.C. DAVIS L. REV. (forthcoming 2008) (manuscript at 14, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1117618) (arguing that, for many of the same reasons that claim construction is indeterminate, the doctrine of patent non-obviousness is indeterminate).

172. *Blonder-Tongue Labs., Inc. v. Univ. of Ill. Found.*, 402 U.S. 313, 331 (1971) (“We are also aware that some courts have frankly stated that patent litigation can present issues so complex that legal minds, without appropriate grounding in science and technology, may have difficulty in reaching decision.”).

173. This applies to judges at all levels, including both district court and appellate court judges.

174. E.g., *Nyssonen v. Bendix Corp.*, 342 F.2d 531, 532 (1st Cir. 1965) (“[T]his [patent] case presents great difficulties to judges like ourselves who have only the most elementary training in science and mathematics and little experience with modern technological developments.”); *Parke-Davis & Co. v. H.K. Mulford Co.*, 189 F. 95, 115 (S.D.N.Y. 1911), *aff’d in part, rev’d in part*, 196 F.

generalist trial court judges. One radical solution is to move away from generalist judges toward judges with areas of technical expertise.¹⁷⁵ Alternatively, special masters or other experts with technical experience could be used within the existing judicial framework.¹⁷⁶ Another possible solution is to consolidate patent cases in a patent court comprised of a subset of the current generalist judges. Yet another solution is to provide more formal training to the current generalist judges on how to construe claims.

However, if experience does not aid trial courts in properly construing patent claims, or if claim construction is helplessly indeterminate, then establishing a quasi-specialized patent trial court from the existing generalist judges will be of no moment. Over the years, various judges, academics, and patent practitioners have suggested assigning patent lawsuits to a limited number of trial judges in the United States.¹⁷⁷ Older proposals have called for creation of a new patent trial-court or empowering the judges on the Court of International Trade to hear patent claims.¹⁷⁸ The most recent manifestation of this idea is the Issa-Schiff-Cohen¹⁷⁹ patent pilot experiment currently pending in Congress.¹⁸⁰

In short, the Issa-Schiff-Cohen proposal permits certain presently sitting generalist judges to hear extra patent cases on a limited-duration test basis.¹⁸¹ It is limited to, at most, the fifteen districts with the greatest amount of

496 (2d Cir. 1912) (“I cannot stop without calling attention to the extraordinary condition of the law which makes it possible for a man without any knowledge of even the rudiments of chemistry to pass upon such questions as these. The inordinate expense of time is the least of the resulting evils, for only a trained chemist is really capable of passing upon such facts . . .”).

175. Because patents are issued for all different technologies, judges could be assigned to disputes based upon technological experience. U.S. Patent Examiners are assigned to review patent applications based upon technical expertise. Moreover, claims must be construed as they would be understood by a person of skill in the art. The closer the fact finder is to that hypothetical person, the easier it will be to understand the underlying technology and properly to construe the claims.

176. The Federal Rules of Civil Procedure permit the court to appoint a master to construe the claims and require the parties to pay the expenses for the master. FED. R. CIV. P. 53.

177. *E.g.*, John B. Pegram, *Should There Be a U.S. Trial Court With a Specialization in Patent Litigation?*, 82 J. PAT. & TRADEMARK OFF. SOC'Y 765 (2000) (advocating that all patent cases be assigned to the United States Court of International Trade); James F. Holderman, Keynote Address, *Judicial Patent Specialization: A View From the Trial Bench*, 2002 U. ILL. J.L. TECH. & POL'Y 425, 431–33 (2002) (supporting Mr. Pegram's proposal to assign patent cases to the United States Court of International Trade).

178. Rochelle Cooper Dreyfuss, *In Search of Institutional Identity: The Federal Circuit Comes of Age*, 23 BERKELEY TECH. L.J. 787, 804–806 (2008); Pegram, *supra* note 177, at 782–86; Arti K. Rai, *Specialized Trial Courts: Concentrating Expertise on Fact*, 17 BERKELEY TECH. L.J. 877 (2002).

179. Representatives Darrell Issa of California, Adam Schiff of California, and Steve Cohen of Tennessee co-sponsored the bill. Govtrack.US, H.R. 34, <http://www.govtrack.us/congress/bill.xpd?bill=h110-34> (last visited Sept. 29, 2008).

180. An Act to Establish a Pilot Program in Certain United States District Courts to Encourage Enhancement of Expertise in Patent Cases Among District Judges, H.R. 34, 110th Cong. (2007) [hereinafter Patent Pilot Program Bill].

181. *Id.*

patent litigation for the “most recent calendar year.”¹⁸² Districts with fewer than ten authorized judgeships—which notably includes the District of Delaware—are ineligible to participate.¹⁸³ If the Program was enacted and signed by the President, the Administrative Office of the United States Courts would be required to designate at least five district courts for participation in the pilot program.¹⁸⁴

Once the district courts were properly selected, the manner of allocating patent cases in these districts would change. District court judges in the selected districts would be entitled either to opt into or out of hearing patent cases.¹⁸⁵ When a patent case was subsequently filed in that district, the case would be randomly assigned to a district court judge.¹⁸⁶ If the assigned judge had opted out of hearing patent cases, he or she could decline to accept the case.¹⁸⁷ In that event, the case would be randomly reassigned to one of the district court judges who opted into hearing patent cases.¹⁸⁸

The Patent Pilot Program assumes that patent experience will reduce the claim construction reversal rate.¹⁸⁹ In practice, however, the assumption may not hold. Under existing Federal Circuit case law, it does not appear that district court judges learn from prior appeals.¹⁹⁰ As a result, based upon past experience, funneling patent cases via the Patent Pilot Program to a smaller subset of judges, on its own, is unlikely to reduce the reversal rate.¹⁹¹ On the other hand, a limited pilot program would operate as a real world experiment to confirm or refute the findings of the present study.

182. *Id.* § 1(b). For Fiscal Year 2007, the judicial districts with the most patent litigation were the Central District of California, Eastern District of Texas, Northern District of California, District of Delaware, District of New Jersey, Northern District of Illinois, Southern District of New York, District of Massachusetts, Northern District of Georgia, Southern District of Florida, District of Minnesota, Eastern District of Pennsylvania, Southern District of California, Eastern District of Michigan, and Middle District of Florida. STATISTICS DIV., ADMIN. OFFICE OF THE U.S. COURTS, 2007 JUDICIAL BUSINESS OF THE UNITED STATES COURT 194-207 tbl. C-11 (2007), available at <http://www.uscourts.gov/judbus2007/JudicialBusinesspdfversion.pdf>.

183. Patent Pilot Program Bill, *supra* note 180, § 1(b)(1). In order for a district to qualify, a minimum of three judges must opt into hearing patent cases. *Id.* § 1(b)(2).

184. *Id.* § 1(b).

185. *Id.* § 1(a)(1)(A).

186. *Id.* § 1(a)(1)(B).

187. *Id.* § 1(a)(1)(C).

188. *Id.* § 1(a)(1)(D).

189. Patent experience may aid in areas of patent law other than claim construction.

190. It is possible that district court judges need a huge number of appeals—i.e., forty or fifty—before they learn. The present study cannot eliminate that possibility. It is also possible that providing education to judges on claim construction would help.

191. The Patent Pilot Program also appropriates \$5,000,000 per year for education of judges in patent law and for compensation for law clerks with technical backgrounds. Patent Pilot Program Bill, *supra* note 180, § 1(f). Presently, few trial court judges have clerks with technical backgrounds. See Alan D. Lurie, U.S. Circuit Judge, Federal Circuit, Speech to PTC Section of D.C. Bar (June 12, 2000), in 60 PAT., TRADEMARK & COPYRIGHT (BNA) 147, 148 (2000). It is possible that more technical law clerks would aid in lowering the reversal rate.

Yet in addition to the experience justification, there are other, separate rationales for considering the Patent Pilot Program. For example, some district court judges enjoy patent cases more than others do. By enabling those who do not desire patent cases to avoid them, we could foster a more content judiciary. And it is not unreasonable to believe that more content judges work more thoroughly on cases.¹⁹² Further, litigants are more satisfied, even when losing, if a district court judge listens patiently to their arguments. Judges who spend more time on patent cases may produce more thoroughly reasoned opinions. Judges who opt into patent cases are more likely to behave this way.

Additionally, the Federal Circuit may notice judges who elect to hear patent cases. Presently, the Federal Circuit does not have the opportunity to repeatedly see district court judges as frequently as the regional circuit courts because it hears appeals nationwide.¹⁹³ Under the Patent Pilot Program, the mere act of asking to hear patent cases may be seen as a signal by the Federal Circuit of some aptitude to decide patent cases. And the more often a particular judge's work is reviewed by the Federal Circuit, the more likely the Federal Circuit will remember the judge. By concentrating patent cases into a smaller pool of judges, district court judges will be more likely to develop a reputation, good or bad, that will precede appeals. In fact, the Federal Circuit may already informally afford deference to certain well-respected district court judges.¹⁹⁴

C. Possible Solutions at the Appellate-Court Level

If the reason for the high claim construction reversal rate resides with the Federal Circuit, then there are several possible fixes.¹⁹⁵ One possible solution is revisiting the de novo aspect of claim construction and providing some deference to the trial court's determinations.¹⁹⁶ Indeed, some have

192. Patent experience may also affect other aspects of litigation, including the duration a lawsuit is pending.

193. The judges for the regional court of appeals are more likely to know the local district court judges, both because of proximity and because of frequency of review. See *FMC Corp. v. Gloucester Eng'g Co.*, 830 F.2d 770, 771–72 (7th Cir. 1987).

194. See Plager, *supra* note 165, at 77–78 (identifying several district court judges with a “particular bent for patent cases”); Interview by Mark Smith with Ronald M. Whyte, U.S. Dist. Judge, N. Dist. of Cal. (Mar. 16, 2007), available at <http://www.techlawforum.net/transcript/whyte-9-representative-claims.txt>.

195. From the data, it is not possible to determine the reason for the high reversal rate and the lack of teaching or learning. It seems likely that the Federal Circuit is at least partially responsible for the high reversal rate. In addition, the rate of non-unanimous opinions by the Federal Circuit in claim construction decisions has increased since *Phillips. Wagner & Petherbridge*, *supra* note 93, at 24. Dissents on the appellate court hint that the reversal rate is not entirely the district court's fault because it shows that there was some disagreement on the correct outcome or reasoning at the appellate level.

196. Changing the standard of review could be done through overruling *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1454–56 (Fed. Cir. 1998) (en banc). Several judges of the Federal Circuit are inclined to do so. See *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 469 F.3d 1039 (Fed.

already suggested this solution.¹⁹⁷ If the goal were merely to reduce the reversal rate, providing deference would likely achieve it. The Federal Circuit would require a higher threshold of district court error before reversal, and the reversal rate would fall for that reason alone. That fix, however, would not correct any more serious shortcomings of the Federal Circuit jurisprudence. Claim constructions in some circumstances involve fact finding by the trial court judge. For example, expert testimony is sometimes received into evidence to educate the court on the background technology.¹⁹⁸ Furthermore, district court judges spend more time on claim construction, often holding multi-day claim construction hearings.¹⁹⁹ In contrast to the “cold” appellate record, district court judges often hear live or video testimony, have better access to the evidence, and are in a better position to judge credibility issues.²⁰⁰ Some argue that claim construction has some factual component and is not a purely legal issue.²⁰¹ In these instances, it makes sense to provide some level of deference to the trial court’s factual findings based or relying upon this background information. Obviously, providing any deference to the trial court’s findings on claim construction will lower the reversal rate. But if the disconnect is with the Federal Circuit, using deference to lower the reversal rate does not fix the cause of the problem, it merely masks the symptom.

Another possible solution is to permit interlocutory appeals of claim construction rulings.²⁰² Congress is presently debating a major patent reform bill that includes the option of interlocutory appeals.²⁰³ Permitting quick appeals of claim construction decisions would provide the benefit of certainty to litigants earlier in the litigation process. However, the Federal Circuit would face a great increase in its docket.²⁰⁴ Furthermore, the underlying

Cir. 2006) (Michel, C.J., dissenting). Alternatively, Congress could change the standard through legislation.

197. See Tom Chen, *Patent Claim Construction: An Appeal for Chevron Deference*, 94 VA. L. REV. (forthcoming 2008); John F. Duffy, *On Improving the Legal Process of Claim Interpretation: Administrative Alternatives*, 2 WASH. U. J.L. & POL’Y 109 (2000); Rai, *supra* note 178.

198. See Paul M. Schoenhard, *Reversing the Reversal Rate: Using Real Property Principles to Guide Federal Circuit Patent Jurisprudence*, 17 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 299 (2007), for a proposal to provide deferential review of claim construction based upon real property law concepts.

199. Fed. Circuit-Bar Ass’n Markman Project, *Guidelines for Patent Claim Construction: The Basics of a Markman Hearing*, 14 FED. CIR. B.J. 771, 779 (2005).

200. See O’Malley et al., *supra* note 7, at 679.

201. See James F. Holderman in collaboration with Halley Guren, *The Patent Litigation Predicament in the United States*, 2007 U. ILL. J.L., TECH. & POL’Y 1, 7 (2007).

202. An even more radical approach would be to overturn *Markman*. Not only does that seem unlikely, but it would also be unwise. Transparency would be decreased if juries construed claims in the “black box” of deliberations.

203. Patent Reform Act of 2007, H.R. 1908, 110th Cong. § 11(b) (2007); Patent Reform Act of 2007, S. 1145, 110th Cong. § 11(b) (2007).

204. This increase would occur because at present many cases in which the claims have been construed settle before an appealable judgment is entered.

litigation in the district court would be delayed a year or more while the claim construction ruling was appealed. On the other hand, if claim construction cannot be determined correctly until Federal Circuit review, accuracy may trump speed and favor interlocutory appeals. On balance, however, this solution pushes too much work to the appellate court and is probably unfeasible for the long term.²⁰⁵

Others have proposed eliminating the Federal Circuit's exclusive jurisdiction over patent infringement complaints.²⁰⁶ Having a second or third appellate court hearing patent cases would allow fresh judges to review claim construction decisions.²⁰⁷ The law of these new patent appellate courts could perhaps develop a body of case law on claim construction that is easier to apply. But even if this proposal were adopted by Congress, it is unclear that a different body of case law would develop. A small gap in the Federal Circuit's jurisdiction over patent cases already exists. The Federal Circuit has jurisdiction only if a well-pleaded complaint asserts a claim under patent laws.²⁰⁸ Federal Circuit jurisdiction is lacking if the claim for relief under the patent laws is brought only via counterclaim. In such cases, the regional circuit must handle the appeal. Only one case has ever fallen into this jurisdictional hole, and, in that case, the Eighth Circuit adopted in full the Federal Circuit's precedent on substantive patent law.²⁰⁹ If a second appellate court were given more direct jurisdiction over patent appeals, the second appellate court would probably follow the lead of the Eighth Circuit by copying the existing Federal Circuit case law.²¹⁰ If the proposed second appellate court merely replicates the existing Federal Circuit case law on claim construction, there will be no benefit to district court judges.

Alternatively, the problem may stem from potential inconsistencies in the Federal Circuit's methodology or ideology.²¹¹ If such inconsistencies

205. Chief Judge Michel of the Federal Circuit has written to Congress on behalf of the Federal Circuit expressing this concern. His letter states: "I would expect an interlocutory appeal in virtually every patent infringement case as soon as a claim construction order issues." Letter from Paul R. Michel, Chief Judge, U.S. Court of Appeals, Federal Circuit, to Senators Patrick Leahy and Arlen Specter, U.S. Senators, 2 (June 13, 2007), available at [http://www.intellectualpropertylawblog.com/Michel%20letter%20to%20Senators%206-13-07\(1\).pdf](http://www.intellectualpropertylawblog.com/Michel%20letter%20to%20Senators%206-13-07(1).pdf). He further predicts that this flood of appeals would not only overload the Federal Circuit, it would lead to "extended delays" for the litigants before the matter is resolved. *Id.*

206. See Craig Allen Nard & John F. Duffy, *Rethinking Patent Law's Uniformity Principle*, 101 Nw. U. L. REV. 1619 (2007).

207. *Id.* at 1651-55.

208. *Holmes Group v. Vornado Air Circulation Sys., Inc.*, 535 U.S. 826 (2002).

209. *Schinzinger v. Mid-States Stainless, Inc.*, 415 F.3d 807, 811 (8th Cir. 2005).

210. Dreyfuss, *supra* note 178, at 810-11. Others have argued that even if the second appellate court adopted different claim construction rules, there is no evidence that increasing the number of judges would increase the quality of decision-making or decisional rules. S. Jay Plager & Lynne E. Pettigrew, *Rethinking Patent Law's Uniformity Principle: A Response to Nard and Duffy*, 101 Nw. U. L. REV. 1735, 1744 (2007).

211. It is possible that certain judges of the Federal Circuit are more likely to rule pro-patent or pro-accused infringer in claim construction cases. The disposition of the appeal could in turn be dependent upon the makeup of the panel.

exist, then they prevent parties from predicting accurate claim constructions prior to appellate review.²¹² The goal of the patent system is innovation, and predictability is thought to help that goal.²¹³ Without predictability, parties will engage in strategic behavior to exploit the system. Litigation costs will be high. Judicial resources will be employed unnecessarily. And, above all, companies will not know if they can sell a product without liability.

In response to current inconsistencies, the Federal Circuit needs to set forth a more coherent and clear doctrine. Its decisions, including its en banc ruling in *Phillips*, have not provided sufficient clarity in the area of claim construction. At a minimum, district court judges must be able to discern how to construe a given patent claim. The Federal Circuit can teach this lesson via either rules or standards.²¹⁴ Either way, doing so will improve predictability in the patent system and should abate the presently high reversal rate.²¹⁵

D. Solutions at the Patent Office

Altering the patent prosecution process can provide another partial solution to mitigate the reversal rate problem. Since all patents must pass through it, the Patent Office is in the ideal position to influence patent clarity.²¹⁶ If the prosecution process somehow could be substantively changed without undue cost or disruption, it could be used to lower any indeterminacy or other problems in claim construction. The following proposal is one possible way to lower indeterminacy issues.

212. Different panels of the Federal Circuit have occasionally construed the same patent terms differently. *E.g.*, Moore, *Judges Equipped*, *supra* note 3, at 18–20 (discussing a case in which a patent was construed inconsistently by two different panels of the Federal Circuit).

213. See Holbrook, *supra* note 4, at 150; Lefstin, *supra* note 2, at 1041.

214. Others have noted that the Supreme Court prefers a standards-based approach in patent cases and that the Federal Circuit prefers a rules-based approach. Claim construction appears to be an example of the Federal Circuit preferring a standards-based approach. See Holbrook, *supra* note 4, at 144–45. As the results of this Article appear to demonstrate, the standards-based approach is largely ineffective.

215. Since the standards approach taken to date appears to be ineffective, one may argue that a rules-based approach is better. Under a rules-based approach, the particular canons of claim construction could remain as presently articulated. But the district court judges would no longer be required or permitted to select which canons to apply in a given situation. The canons of construction could be locked into a fixed hierarchy at the appellate court level. For example, the first rule could be that limitations are *never* imported from the specification into the claim. This hierarchy could be set with a practical goal in mind—the more objective and easily definable the canon, the more important the Court should deem the rule. However, selecting the hierarchy requires policy decisions because it will have policy implications. The precise order of application of the canons will affect the value of patents. Making rules that broaden patents favors patentees, while making rules that result in narrow constructions disfavor patentees. It would also be difficult to prescribe iron-clad rules for all claim construction issues. And even iron-clad rules like the “dictionary first” rule from *Texas Digital Systems, Inc. v. Telegenix, Inc.* still leave the indeterminacy of words problems. 308 F.3d 1193 (Fed. Cir. 2002). Thus, it is likely unfeasible to shift claim construction to a rules-based approach. Plager & Pettigrew, *supra* note 210, at 1746.

216. Plager & Pettigrew, *supra* note 210, at 1746.

First, Patent Office rules could be changed to bring patent claim drafting more in line with standard English.²¹⁷ Second, the Patent Office could provide additional guidance on the contents of the specification of the patent. For example, the Patent Office, if appropriately authorized, could require the applicant to provide a certain number of example embodiments of the invention. Furthermore, commonly used phrases could be defined (such as “in accordance with one embodiment of the invention”) to remove indeterminacy later in litigation. Finally, the examination process could be revitalized to clarify the meaning of claim terms.²¹⁸ For instance, the Patent Office could alter its practice to begin regularly asking applicants to define important claim terms, including both what falls within the applicants’ definition and what falls outside of the applicant’s definition. In short, while the patent prosecution process cannot completely eliminate all inherent indeterminacy involved in some claim constructions, it can reduce the number of claim terms that are indeterminate and make it easier for district court judges and the Federal Circuit to construe claims.

CONCLUSION

Many have criticized district court judges for the high claim construction reversal rates in patent cases. This empirical study of the Federal Circuit’s review of district court judges indicates that the reversal rate may be essentially constant, regardless of the prior claim construction experience of the district court judge. All judges have access to the universe of reported decisions. If district court judges are supposed to learn from appellate court review of their cases over and above the background learning from the universe of reported cases, one would expect some improvement of the reversal rate as experience increases. Contrary to theory, district court judges do not appear to improve based upon various measures of experience.²¹⁹ As to the specific problem in patent law, this Article points to three possible explanations for the lack of improvement: (1) an indeterminate nature of claim construction; (2) a failure of the Federal Circuit to teach properly how to construe claims; and (3) a failure of district court judges to learn claim construction. The data suggests that quasi-specialized patent trial judges, as

217. See Plager, *supra* note 165, at 72.

218. See Lee Petherbridge, *Positive Examination*, 46 IDEA 173 (2006) (arguing that an important part of the problem with claim construction is that the U.S. Patent Office does not focus its examination on the scope of the claims and urging reform to make prosecution focus on establishing the boundaries of patent claims).

219. Further study of the cause of the high reversal rate is warranted. It is possible that a more complex study which models the relationship between the appellate and district courts with multiple control variables might yield a different result. A future study should focus on lawsuits at the time of filing to reduce potential selection-bias concerns. These lawsuits could be traced and evaluated at various points during the litigation process. It would also be advisable to control for various aspects that may affect the appeal rate of the cases. For example, non-practicing entities as patentee may be more likely to appeal an adverse claim construction. Similarly, a generic drug manufacturer as an accused infringer may be more likely than average to appeal an adverse claim construction.

proposed in pending legislation, would not automatically reduce the reversal rate. However, the Patent Pilot Program is a modest proposal, especially in contrast to other proposals that permanently enshrine a new group of specialized judges to hear patent cases. The Pilot Program can test the teaching-learning hypothesis more directly while serving as a further check on the validity of the present study.

Further, with regard to the court system more broadly, the data leads one to consider whether the teaching-learning hypothesis should be revisited. Further empirical studies should be conducted to see if what is happening in the patent context, namely a failure to learn or teach, occurs in other areas of law. If trial courts do not learn from appellate courts, a different model of understanding the entire court system, not just as applied to patent law, may be necessary.

APPENDIX A:
SELECTION, CODING, AND RELIABILITY OF THE DATASET

For ease of replication, this Appendix includes information on how the dataset was selected and coded. It also includes information regarding the coders and the reliability of the dataset.

1. *The Appellate Decisions*

All the Federal Circuit cases in which the parties disputed the district court's construction of a claim limitation were collected for an approximately eleven-year period. Both the LexisNexis and Westlaw sources were utilized to locate the relevant decisions for the appellate dataset. As described in Appendix A.1.a below, the LexisNexis source was used to locate opinion cases. As described in Appendix A.2 below, the Westlaw source was used to find Rule 36 cases.

a. *The Precedential and Non-Precedential Written Opinions*

The LexisNexis "CAFC" database was used to locate opinion cases.²²⁰ According to LexisNexis, this database includes all patent decisions from the Court of Appeals for the Federal Circuit from October 1982 to the present. The search found 1306 cases that satisfied the query.²²¹

Each of the 1306 cases was read by at least one coder to determine whether the case contained a resolution by the Federal Circuit of an issue of patent claim construction that a district court had previously decided. Claim construction was performed most frequently in determining infringement, and occasionally in determining validity²²² and other issues. Irrelevant cases were removed. Excluded cases included appeals from the Court of Federal Claims, appeals from the International Trade Commission, and appeals from the Board of Patent Appeals and Interferences. Cases involving only design patents were also removed. In addition, cases were removed in which any of the following occurred: the issue of patent claim construction (i) was not decided by the Federal Circuit, (ii) was not decided in the first instance by

220. The exact search query was "claim w/10 (constru! or interp!) and date(geq (04/24/1996) and leq (6/30/2007))".

221. The LexisNexis CAFC database appeared to have minor instability issues. When identical queries were run one week apart, the number of hits went down slightly. A sample of the missing cases were manually checked, and it was determined they should not have been in the CAFC database in the first instance. These cases included non-patent appeals from the United States Court of Appeals for Veterans Claims and other irrelevant appeals. A call to a search consultant for LexisNexis confirmed that technical improvements were being made to the CAFC database during the time the searches were executed. Cf. Jason J. Czarnecki & William F. Ford, *The Phantom Philosophy? An Empirical Investigation of Legal Interpretation*, 65 MD. L. REV. 841, 862 n.95 (2006) (noting other unexplained inconsistencies in a LexisNexis database).

222. While a validity analysis technically requires claim construction, a majority of Federal Circuit decisions relating to validity do not explicitly address it.

the district court, e.g., claim construction had been submitted to the jury,²²³ or (iii) was not disputed by the parties. Finally, appellate decisions that were withdrawn or superseded were removed.²²⁴

After filtering the initial LexisNexis search results, 746 Federal Circuit decisions remained that expressly evaluated a lower court judge's claim construction.²²⁵

b. *The Summary Affirmances Under Federal Circuit Rule 36*

The Westlaw "CTAF" database was used to find Rule 36 cases.²²⁶ According to Westlaw, this database includes all decisions from the Court of Appeals for the Federal Circuit since its inception in 1982, including patent and non-patent cases. The search returned 1584 cases that satisfied the query. Next, appeals from any tribunal other than the district courts (such as the International Trade Commission) were removed. For each of the remaining cases, the opening appellant brief filed in connection with the appeal to the Federal Circuit was reviewed. If the issue of the district court's claim construction was raised, the case was considered relevant to the project. Otherwise, the case was eliminated as irrelevant. If there was any ambiguity, the appellee brief in the case was reviewed.

In approximately sixty-five cases, the appeal briefs could not be located in cases involving an appeal from a final judgment on a patent infringement cause of action. In those cases, other publicly available information was reviewed to eliminate irrelevant cases, including documents available on the U.S. government's Public Access to Court Records ("PACER") system,²²⁷ Westlaw, and LexisNexis. The attorneys representing the parties in the remaining cases provided pertinent information about the cases. After all information was reviewed, relevant Rule 36 cases were included in the database.²²⁸

223. In a small number of Federal Circuit decisions issued shortly after *Markman*, the district court trial had occurred prior to *Markman*, and a jury had construed the claims.

224. A very few cases were eliminated in which the Federal Circuit decided two cases on the same day from the same judge on the same claim terms of the same patent(s). The only difference in the cases was the identity of the defendant(s). In these instances, one of the companion cases was eliminated. It did not make sense to count these cases as two separate decisions by a particular district court judge.

225. Included in the lower court judges' decisions were nineteen cases decided entirely by U.S. magistrate judges. Apparently, the parties in those cases consented to trial before a federal magistrate judge, and the magistrate judge construed the claims and entered final judgment.

226. The exact search query was "((("federal circuit rule 36") (fed.cir.r.36) (fed.cir +2 r.36) (fed.cir.r +2 36)) & da(aft 4/23/1996 & bef 7/1/2007))".

227. The PACER Service Center is maintained by the Administrative Office of the U.S. Courts and is available at <http://pacer.psc.uscourts.gov/>.

228. There were five Rule 36 cases for which there was insufficient information to determine whether claim construction was at issue on appeal. These cases were not included in the study.

2. *Construction of the Appellate Decision Database*

After selecting the relevant 952 appellate decisions, a database was constructed containing a variety of information from and about each case. The various techniques used to locate the desired fields of information are described below.

a. *Coding Techniques for the Written Opinions*

Several methods were utilized to code the selected cases properly. Initially, for the opinion cases, custom-designed software automatically populated various fields. The automatically coded fields are items that are present in all or most of the cases. The automatically coded fields include, for example:

1. the appellant and appellee party names;
2. the Federal Circuit docket number;
3. the case citation;
4. the issue date of the opinion;
5. the names of each of the three Federal Circuit judges on the panel;
6. the name of the judge authoring the majority opinion;
7. the names, if any, of the judges authoring the dissenting (or dissenting-in-part) or concurring (or concurring-in-part) opinions;
8. the disposition of the case at the Federal Circuit; and
9. the precedential or non-precedential nature of the opinion.

For the opinion cases, human coders also read each case. All of the human coders had technical backgrounds. The human coders verified the automatically generated fields and corrected or completed those that were blank or incorrectly derived by the software. The human coders also inputted the following fields:

1. the judicial district of the district court being appealed in the case—e.g., Northern District of California;
2. the disposition of the case at the trial court—e.g., summary judgment of noninfringement;
3. the patent numbers appealed;
4. the number of claim terms appealed;
5. the Federal Circuit's resolution of each disputed claim term; and
6. the name of the district court judge.

Determining the district court judge's identity was more difficult than anticipated. It was critical because this project involves classification and analysis of cases based upon the identity of the district court judge. In a

subset of the opinion cases, LexisNexis provided the identity information within the case itself. For example, LexisNexis sometimes provides a field before the actual text of the Federal Circuit's opinion that recites the "prior history" of the case. The district court judge's name is often found in that field. If it was, the search for the district court judge's name was completed. In a large percentage of Federal Circuit cases, LexisNexis (and Westlaw) did not provide the identity of the district court judge.

In some cases, LexisNexis did not provide a "prior history" field, or that field did not identify the district court judge. If the Federal Circuit opinion provided a citation to a district court's opinion available through an electronic search engine, the district court opinion was retrieved and the judge's name was found in that opinion. When this option failed, the district court judge's name was located through PACER or LexisNexis's CourtLink Litigant Strategic Profile service. Alternatively, the district court judge's identity was located from the cover page of the briefs filed with the Federal Circuit.²²⁹ Using these methods in combination, the district court judge was identified for every case in the appellate database.

b. *Coding Techniques for the Federal Circuit Rule 36 Affirmances*

All Rule 36 cases were manually coded. The Rule 36 cases were coded using the same fields as were used for the opinion cases. The information often was found in the appellant or appellee brief filed with the Federal Circuit. Because all of these cases were affirmances, all 206 cases affirmed the district court judge's claim construction. Further, by definition, all Rule 36 cases were non-precedential.

3. *Reliability and Validity of the Appellate Decision Database*

For the opinion cases and the Rule 36 cases, the level of inter-coder agreement was calculated using Cohen's Kappa. Cohen's Kappa ranges from 0 to 1, with numbers near 1 indicating a higher degree of reliability. Two human coders coded the opinion cases. The author was one of the coders, and a law student beginning his second year was the other. Initially, a "pilot study" was performed during which the fields to be measured were refined. Each coder completed the fields for ten cases in the database. We discussed and compared the conclusions. The conclusions and fields were found to agree on substantially all of the sample cases. Thereafter, the entire list of opinion cases was read and coded.

The author coded approximately 83% of the opinion cases, and the student coder analyzed the remaining 17%. After all opinion cases were coded, each coder coded a random sample of 10% of the other coder's cases. Consequently, the student coder analyzed 108 cases which the author had coded, and the author analyzed 22 cases which the student coder had coded. The

229. FED. CIR. R. APP. P. 32.1 (Practice Notes).

percentage agreement between the coders was 93.8% for relevance to claim construction and 96.6% for resolution of the claim term.

A single human coder coded the Rule 36 cases. The Rule 36 coder was a third-year law student and was not one of the opinion case coders. The author coded a random sample of ten percent (i.e., 158 cases) of the entire set of Rule 36 cases to test the reliability of the Rule 36 case coding. The percentage agreement between the coders was 98.5% for relevance to claim construction.

Table 5 below presents the calculations of Cohen's Kappa for the fields most used in this study.

TABLE 5
RELIABILITY OF THE DATASETS

Dataset	Field	Cohen's K	Reliability ²³⁰
Opinion cases	Relevance to claim construction	0.845	Reasonably strong
Opinion cases	Resolution of claim term(s)	0.925	Very reliable
Rule 36 cases	Relevance to claim construction	0.902	Very reliable

As is evident from Table 5, the reliability of the database is high for the relevance of the cases and resolution of the claim terms. As a further check on the data, the author coded the seventeen percent of opinion cases that the student coder had reviewed. Through comparison of the student coder and author's results, any errors that did not require subjective judgment were corrected. Thus, all opinion cases coded by the student coder were double checked.

In addition, there was 100% inter-coder agreement on the identity of the district court judge in both the opinion cases and the Rule 36 cases. The results of this study should not be compromised due to unreliable data.

4. *The District Court Judge Lawsuit Database*

For each district court judge in the appellate database, information was gathered relating to his or her background and experience. As an initial measure of experience, it was determined how long each district court judge had been on the federal bench and when each judge was born. This basic

230. See Matthew Lombard et al., Practical Resources for Assessing and Reporting Intercoder Reliability in Content Analysis Research Projects, <http://www.temple.edu/sct/mmc/reliability> (last visited Aug. 16, 2008).

information is available from numerous sources, including the Federal Judicial Center.²³¹

Additionally, the number of patent cases each district court judge handled each calendar year from 1995 until 2005 was determined. The yearly number of patent cases handled by each district court judge was obtained through LexisNexis's CourtLink service.²³² The CourtLink service permits searching of district court docket information. CourtLink obtains the electronic docket information from PACER and claims to have all electronic PACER dockets since PACER was created in the early 1990s.²³³ Unlike PACER, however, CourtLink permits a search to be tailored to a particular district court judge. This service is called a "Judicial Strategic Profile."

To limit the search results to only patent cases, CourtLink permits the Judicial Strategic Profile to be further limited by the nature of the lawsuit. The nature of the lawsuit field corresponds to the types of cases parties can select when they complete the Civil Action Coversheet that must be filed in connection with each new lawsuit.²³⁴ A separate Judicial Strategic Profile was performed on each district court judge who had a case that had been reviewed by the Federal Circuit on claim construction, and the relevant data was extracted from the results. The number of patent cases provided by CourtLink for each district court judge was not modified or altered.

231. Federal Judicial Center, Judges of the United States Courts, <http://www.fjc.gov/public/home.nsf/hisj> (last visited Sept. 29, 2008).

232. LexisNexis Courtlink, <http://www.lexisnexis.com/courtlink/online> (last visited Sept. 29, 2008).

233. LexisNexis Courtlink Frequently Asked Questions, <http://www.lexisnexis.com/courtlink/online/faqs.asp> (last visited Aug. 16, 2008).

234. A small number of patent cases may be misclassified as trademark cases in PACER and thus may not appear in response to a search limited to patent cases. Deepak Somaya, *Strategic Determinants of Decisions Not to Settle Patent Litigation*, 24 STRATEGIC MGMT. J. 17 (2003). Others have found that some cases coded as patent cases in PACER are not patent cases in fact. *See, e.g.*, Kesan & Ball, *supra* note 101, at 261 (finding that the nature of suit category was overinclusive by about eight to ten percent for three years of patent filings).

It is believed the results include all cases in which the district court judge was the judge of record at the time the matter was closed—settlement, judgment, transfer, or otherwise—or was the judge who was presiding over a case pending at the time of this Article.

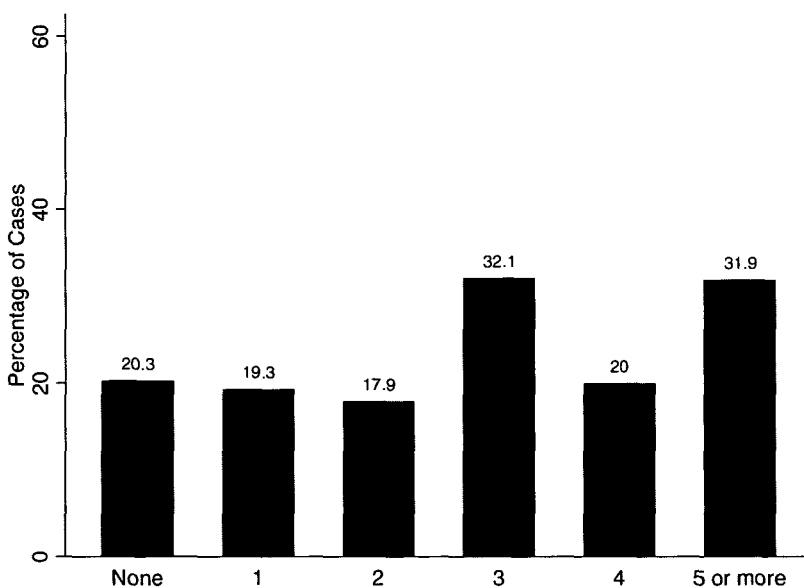
APPENDIX B:
ADDITIONAL DATA AND ANALYSIS

Appendix B includes additional analysis regarding the appellate and district court judge datasets. The datasets are analyzed according to a variety of additional hypotheses. Further, Appendix B.4 probes and tests the possibility of a selection bias.

1. *Rule 36 Affirmances*

Using the dataset, this Article analyzed whether district court judges are more likely to be summarily affirmed under Rule 36 the more times they are appealed to the Federal Circuit. If this relationship exists, then perhaps the Federal Circuit is learning that particular judges need less supervision and concluding that their judgments can be affirmed without decision. The theory is that as district court judges become more proficient at claim construction through experience, the likelihood that the Federal Circuit will affirm without a written opinion should increase. As a benchmark, over the entire eleven-year period, the Federal Circuit affirmed approximately 21.4% of the claim construction cases of district court judges by use of Rule 36.

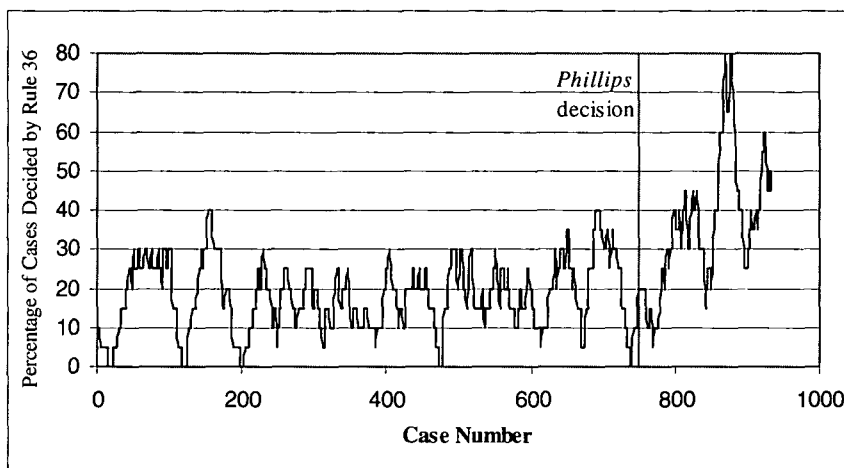
FIGURE 8
RULE 36 BASED ON NUMBER OF PRIOR APPEALS



As shown in Figure 8 above, the range of appellate decisions utilizing Rule 36 is between 17.1% and 32.1%.²³⁵ With the exception of the judges with five or more appeals (and the one data point corresponding to exactly three prior appeals), it does not appear that the Federal Circuit affirms repeatedly appealed judges under Rule 36 more frequently.²³⁶

The Federal Circuit has used Rule 36 unevenly over time. The use of Rule 36 affirmances appears to have become more common since the *Phillips* decision. Since *Phillips*, 35.3% of claim construction appeals of cases handled by district court judges have been affirmed under Rule 36. The historical trend of the use of Rule 36 is illustrated below in Figure 9 through use of a twenty-case trailing average.

FIGURE 9
USE OF RULE 36 IN CLAIM CONSTRUCTION CASES



As labeled in Figure 9 above, the *Phillips* decision occurred at approximately $n=750$. The heightened use of Rule 36 in cases in which the judge had been appealed five or more times may be at least partially explained by the increase in frequency in the use of Rule 36 over time, particularly after the *Phillips* decision. It may be that a disproportionate number of cases in this category fall in that time frame.

235. More precisely, 20.3%, 19.3%, 17.9%, 32.1%, 20.0%, and 31.9% of decisions in the claim construction appellate database were Rule 36 decisions for judges with zero, one, two, three, four, and five or more prior appeals, respectively.

236. Excluding the last group, the null hypothesis that the percentages in each group are the same cannot be rejected. The *chi-square* test p-value was 0.154, which is greater than the expected p-value for a 95% confidence level. Including all groups, the *chi-square* test p-value was 0.069, just slightly greater than the expected p-value for a 95% confidence level.

Similar to the analysis for prior appeals, this Article analyzes whether district court judges with more total claim construction patent appeals were more likely to be summarily affirmed under Rule 36 by the Federal Circuit.

FIGURE 10
RULE 36 BASED UPON TOTAL NUMBER OF APPEALS

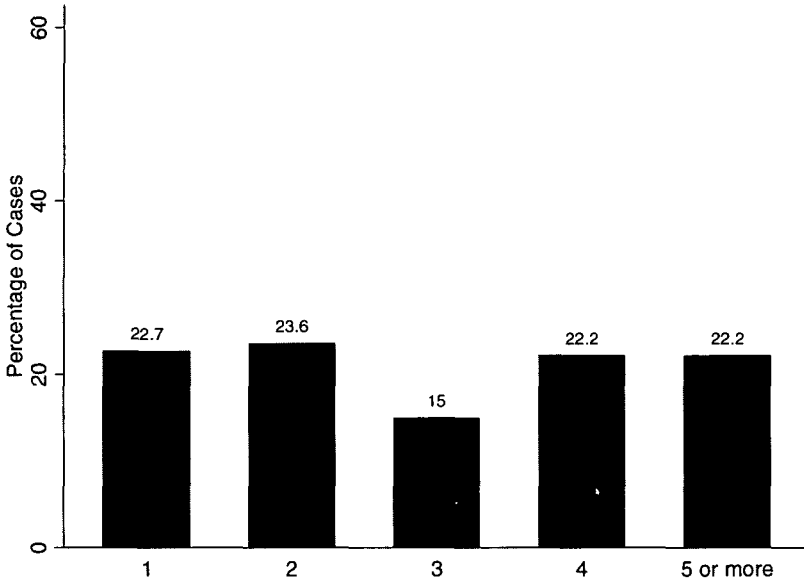


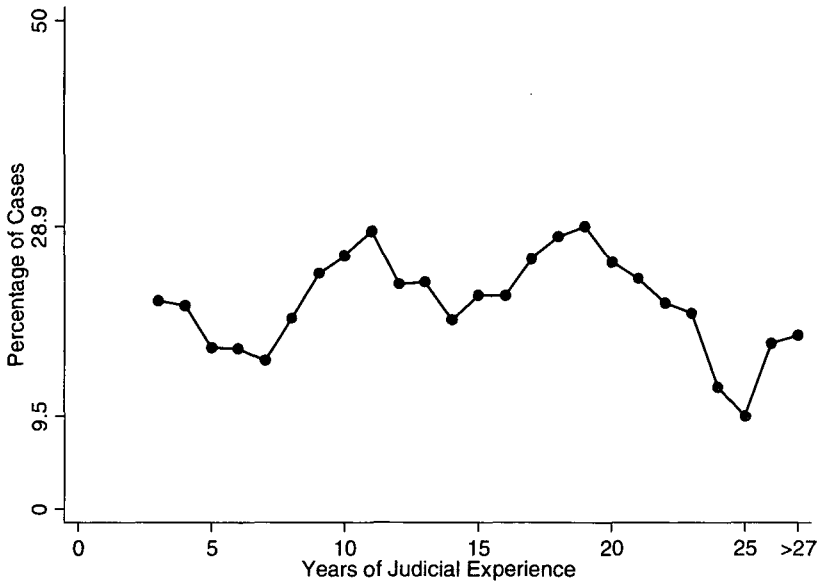
Figure 10 shows that there is almost no difference between the number of total appeals taken from a district court judge and the use of Rule 36.²³⁷ There again seems to be little if any pattern to this data.²³⁸ Thus, it may be that the Federal Circuit affirms cases under Rule 36 without regard to the identity of the district court judge.

Figure 11 below shows the trailing three-year moving average of the rate at which the Federal Circuit affirmed district court judges using Rule 36 based upon judicial experience.

237. More precisely, 22.7%, 23.6%, 15.0%, 22.2%, and 22.2% of the cases were decided using Rule 36 or judges with a total of one, two, three, four, and five, or more total appeals, respectively.

238. The null hypothesis that the percentages in each group are the same cannot be rejected. The *chi-square* test p-value was 0.479, which is greater than the expected p-value for a 95% confidence level.

FIGURE 11
MOVING AVERAGE OF RULE 36 BASED UPON JUDICIAL EXPERIENCE



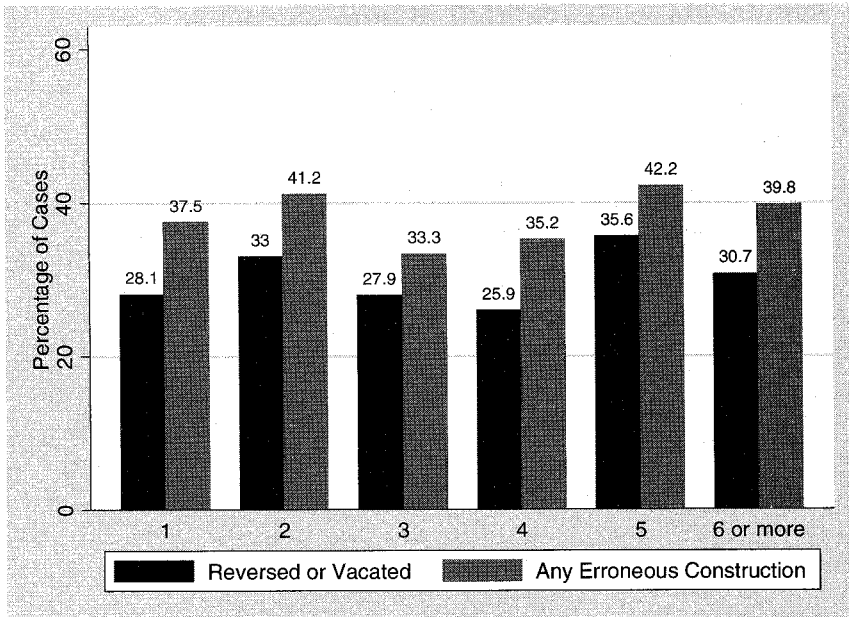
The hypothesis here is that the Federal Circuit uses Rule 36 decisions more in cases with judicially experienced judges. The data do not fully support this hypothesis.

2. *The Most-Appealed District Court Judges*

Another possible hypothesis is that judges do not gain meaningful experience from being reviewed on appeal and that, instead, the judges with the largest number of appeals are the judges least often reversed. More specifically, the hypothesis is that the district court judges who are appealed the most are the ones that hear the most cases and are better at claim construction.

From the dataset, the district court judges were grouped based upon the total number of claim constructions they decided and which decisions were appealed. Grouping the data in this way differs significantly from grouping the data by number of prior appeals. In grouping by number of prior appeals, all rookie performances are included together, regardless of whether the district court judge eventually had one, two, three, four, five, or six or more appeals. In grouping the data by the total number of appeals, all of the performances by district court judges with ten appeals are counted in a single bucket. A separate bucket holds all appeals of judges with four appeals, and so on. Figure 12 below shows the overall record of district court judges based upon number of patent appeals.

FIGURE 12
REVERSAL RATE BASED UPON TOTAL NUMBER OF APPEALS



Similar to the results based upon prior number of appeals, there does not seem to be much difference in appellate success based on the total number of appealed claim constructions.²³⁹ Judges with greater experience handling patent cases (as reflected in a larger number of appeals of claim construction decisions) do not appear to outperform judges with lesser experience.²⁴⁰ The spread is between 26.2% and 35.6% for reversals and 33.3% and 42.2% for errors.²⁴¹

The judges with the most claim construction appeals were reversed at a rate of 30.7%, and the judges who were appealed only once were reversed at a rate of 28.1%. By aggregating the judges with the most claim construction

239. Here too, the null hypothesis that the percentages in each group are the same cannot be rejected. The *chi-square* test p-value was 0.696, which is greater than the expected p-value for a 95% confidence level.

240. The dataset obviously includes some district court judges who handle a large number of patent lawsuits and who are particularly efficient at encouraging settlement. These judges have a lower number of appeals than judges who are otherwise comparably busy. The dataset was not adjusted to take into account efficiency at encouraging settlements.

241. More precisely, 28.1%, 33.0%, 27.9%, 25.9%, 35.6% and 30.7% of cases were reversed, vacated, and/or remanded due to a claim construction error for judges that had one, two, three, four, five, and six or more, respectively, total claim construction appeals. The number of observations for each bar was 256, 182 (91 judges), 147 (49 judges), 108 (27 judges), 45 (9 judges), and 176 (21 judges), respectively. The data also shows that 37.5%, 41.2%, 33.3%, 35.2%, 42.2%, and 39.8% of cases had at least one error in claim construction for judges that had one, two, three, four, five, and six or more, respectively, total claim construction appeals.

appeals together, there is a possibility that there are two distinct subgroups: one subgroup with judges who are very good at claim construction and are never reversed, and one subgroup that includes judges who are very bad at claim construction and are often reversed. There is a possibility that by lumping these two subgroups together, the good and the bad cancel each other out. Conversely, if the reversals were more random, one would expect the reversal rates of the busy judges to form a close-to-normal, bell-shaped distribution around the average reversal rate. To evaluate this possibility, Figure 13 below shows the distribution of the lifetime percentage reversed by judge for judges with six or more claim construction appeals. There were twenty-one judges who fit in this category. For example, if a judge had five cases that were affirmed and one case that was reversed, that judge's cumulative percentage would be 83.3%.

FIGURE 13
HISTOGRAM—JUDGES WITH MORE THAN FIVE APPEALS

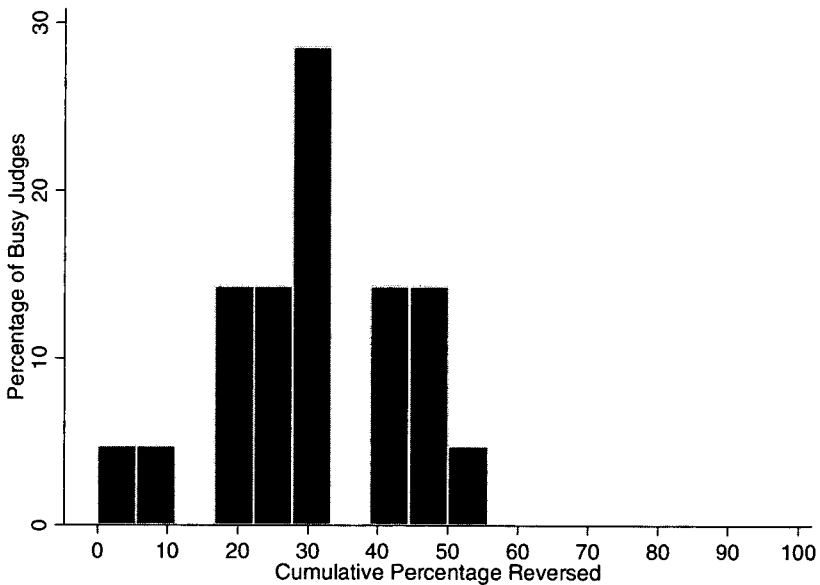


Figure 13 appears to approximate a normal distribution. The mean cumulative percentage reversed is 31.6%.²⁴² Over seventy-five percent of the cumulative percentage reversed fall somewhat near the mean. There are not two separate large groups of judges far away from the mean. Consequently, it does not appear that the judges with six or more appeals are divided into

242. This number differs from the overall reversal rate because the cumulative percentage is an average of the raw, underlying data.

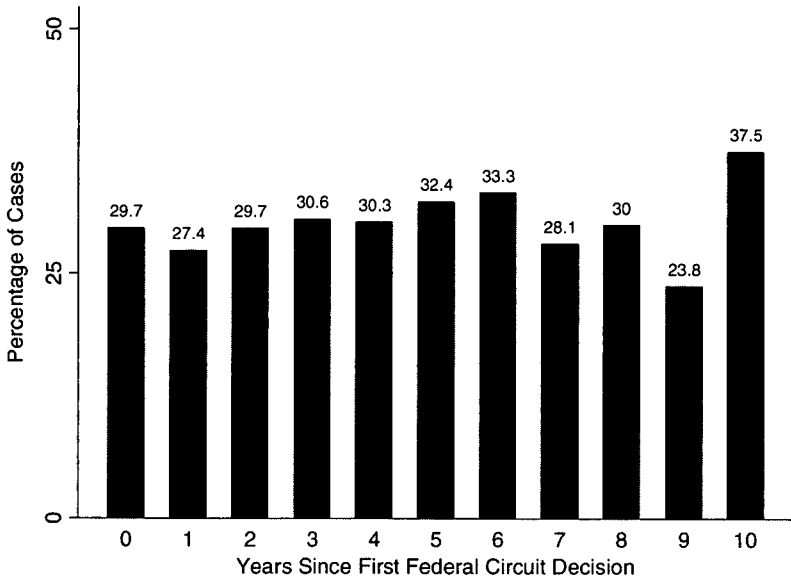
two opposite groups, one good at claim construction and one bad at claim construction.

3. Time-Adjusted Reversal Rate

This Article attempted to adjust for the amount of time between appeals. To do so, each district court judge's appeal record was calculated for each year beginning the year of his or her first Federal Circuit decision. Take as an example Judge X who had been reviewed on appeal four times, once in 1999 (affirmed), twice in 2003 (affirmed and reversed), and once in 2005 (affirmed). Using the time-adjusted calculations, Judge X was affirmed once in year zero (the 1999 year), affirmed once and reversed once in year four, and affirmed once in year six. Similar calculations were performed on all judges.

The hypothesis is that the longer it has been since a judge's first review on appeal, the longer the judge has had to adjust and correct errors in claim construction methodology. Spacing the data by time since first claim construction appeal may be a better measure of experience than either time on the bench or number of patent cases handled. It may also be a better measure of "relevant" experience because it measures experience since the first time a district court judge's work received scrutiny from the appellate court. According to this hypothesis, the reversal rate should decrease over time since the first appeal. A possible alternative hypothesis is that if it has been too long since a judge's first decision, the judge may have forgotten the significance of the appellate decision. Figure 14 below shows the reversal rate over time for the district court judges.

FIGURE 14
TIME-ADJUSTED REVERSAL RATE



Year zero is the year of the first Federal Circuit opinion. The range of reversal rates is fairly tight across all years, being between 23.8% and 37.5%.²⁴³ Accordingly, there does not appear to be a significant relationship between the number of years since the first opinion and the reversal rate.²⁴⁴

4. Potential Selection Bias

As noted in Section II.D, the chance of a selection bias is one major limitation of the present study. One potential selection bias is that litigants take into account the likelihood that a given district court judge will be reversed in deciding whether to appeal. According to this theory, if the parties understand that a given judge is frequently affirmed on claim construction appeals, they will be more likely to settle. Conversely, if a judge is known to be reversed routinely on patent claim construction appeals, the parties will be more likely to appeal adverse decisions.

243. More particularly, 29.7%, 27.4%, 29.7%, 30.6%, 30.3%, 32.4%, 33.3%, 28.1%, 30.0%, 23.8%, and 37.5% of the cases were reversed, vacated, and/or remanded due to claim construction for district court judges with zero, one, two, three, four, five, six, seven, eight, nine, or ten or more years since their first Federal Circuit claim construction decision, respectively. The number of observations for each bar, beginning with year zero, was 512, 84, 74, 62, 66, 34, 39, 32, 20, 21, and 8.

244. The null hypothesis that the percentages in each group are the same cannot be rejected. The *chi-square* test p-value was 1.000, which is greater than the expected p-value for a 95% confidence level.

To investigate, the district court judges were divided into three categories: those whose decisions were reversed, vacated, and/or remanded (1) much less often than the average rate; (2) much more often than the average rate; and (3) at any other rate.²⁴⁵ The judges who were reversed substantially less often than average were from the following judicial districts: the Northern District of California (2 judges); the District of Delaware (2 judges); the Eastern District of Virginia (1 judge); the Northern District of Illinois (1 judge); the District of Massachusetts (1 judge); the Northern District of New York (1 judge); the Northern District of Texas (1 judge); and the District of Minnesota (1 judge). The judges who were reversed substantially more often than average hailed from the following judicial districts: the District of Minnesota (3 judges); the Central District of California (2 judges); the Northern District of California (1 judge); the Southern District of Indiana (1 judge); the Northern District of Indiana (1 judge); the District of Utah (1 judge); the Northern District of Texas (1 judge); the District of Massachusetts (1 judge); the Northern District of Illinois (1 judge); and the Western District of Washington (1 judge).

The appeal rate (the ratio of the number of patent claim construction appeal decisions to the number of patent lawsuits handled) was calculated for these “good” and “bad” judges. The appeal rate for the “good” judges was 0.0556. The appeal rate for the “bad” judges was 0.0620. The appeal rate for all other judges—the non-“good” and non-“bad” judges in the district court judge database—was 0.0563. Thus, the appeal rate of the “good” judges was very close to the average appeal rate. Using this information alone, it does not appear that litigants are foregoing a significant number of appeals because their judge had a low reversal rate on claim construction. The appeal rate of the “bad” judges was approximately ten percent higher than the average appeal rate. Using this information alone, there is very slight support for the idea that litigants appeal claim constructions more frequently for judges who are reversed more often. The higher appeal rate for “bad” judges may also be caused by litigants’ self-selection regarding the judges to whom they would appeal. It may also be caused by other characteristics of the judges or cases or by case management issues.

245. To compare district court judges with different numbers of appeals, a table was derived of the odds of all combinations of decisions affirmed and decisions reversed, vacated, and/or remanded. To determine the odds, it was assumed that the likelihood of being affirmed for each decision was 70.0% (which is approximately the actual average affirmance rate for this dataset) and that the odds for each decision were independent. For example, for judges with four appeals, there is a 0.8% chance of having four reversals ($1 \cdot (0.3) \cdot (0.3) \cdot (0.3) \cdot (0.3)$), a 7.6% chance of one affirmance and three reversal/vacated ($4 \cdot (0.7) \cdot (0.3) \cdot (0.3) \cdot (0.3)$), a 26.5% chance of two affirmances and two reversals ($6 \cdot (0.7) \cdot (0.7) \cdot (0.3) \cdot (0.3)$), a 41.2% chance of three affirmances and one reversal ($4 \cdot (0.7) \cdot (0.7) \cdot (0.7) \cdot (0.3)$), and a 24.0% chance of four affirmances ($1 \cdot (0.7) \cdot (0.7) \cdot (0.7) \cdot (0.7)$). From the table, the ten judges were selected whose decisions were reversed, vacated, and/or remanded the least (the “good” judges), based upon the likelihood of randomly achieving those results. The thirteen judges were also selected whose decisions were reversed, vacated, and/or remanded the most (the “bad” judges), based upon the likelihood of randomly achieving those results. An equal number of “good” and “bad” judges could not be selected because the break of judges with the same record was uneven.

In short, while there is at least some empirical support for the proposition that litigants appeal cases at a greater frequency from judges that have been reversed more often, the amount of this selection bias appears relatively small, especially when compared with the overall level of appeals. There does not appear to be support for the proposition that litigants appeal cases at a lower frequency from judges that have been reversed less often. However, these propositions were tested using a very limited subset of the data—judges that handled a high number of patent infringement lawsuits had at least three appeals and whose reversal rate was at least one standard deviation from the norm. From this limited testing, this Article cannot quantify the extent of any selection bias; any selection bias may be limited to the extreme fringes of the dataset.