
Article

Behavioral Claim Construction

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INTRODUCTION

The claims of a patent define the “metes and bounds” of an invention over which the patent owner has a legal right to bar its practice by others. Whether a patent claim is valid and infringed turns on “claim construction”—the interpretation¹ of claim language in order to ascertain the boundaries of a patent claim. Despite the existence of a single, semispecialized appellate court—the United States Court of Appeals for the Federal

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1. Some scholars have noted a distinction between “interpretation” and “construction.” See Tun-Jen Chiang & Lawrence B. Solum, *The Interpretation-Construction Distinction in Patent Law*, 123 YALE L.J. 530, 534–35 (2013) (differentiating between “determining the linguistic meaning of a text (‘interpretation’), and giving legal effect to that text (‘construction’). For the purposes of this Article, “interpretation” and “construction” will be used interchangeably because they are largely treated as synonyms by various actors in the patent system to refer to the process of ascertaining claim scope. For example, examiners apply the “broadest reasonable *interpretation*,” while district courts are often referred to as engaging in claim *construction*. *In re Baker Hughes Inc.*, 215 F.3d 1297, 1301 (Fed. Cir. 2000) (emphasis added).

Circuit—that handles all patent appeals, claim construction remains notoriously unpredictable.² The inability of the public to reliably ascertain the boundaries of a patent claim creates a failure of notice that increases the risk of inadvertent infringement and litigation,³ which may dissuade investments in new technologies.⁴ By way of analyzing the causes of uncertainty in claim construction, scholars have undertaken doctrinal, historical, linguistic, and empirical studies.⁵ However, much less attention has focused on analyzing claim construction through the lens of behavioral science—in particular, cognitive and social psychology—in evaluating the extent to which the reader-to-reader⁶ variance in interpretations of the same claim may be a function of the boundedly rational⁷ nature of its readers, who are heavily influenced by their environment.⁸

This Article undertakes the first detailed exploration of the behavioral elements—such as cognitive biases, priors, and situational factors—that may influence how a reader interprets a claim. Because behavioral elements tend to affect readers at an unconscious level, they can pervade the process of construing claims, affecting the choice of canons, the selection of interpretive sources, the crafting of arguments, and the construction adopted (by a court). Analyzing the behavioral aspects of claim construction may help increase our understanding as to why a single claim may have N different meanings according to N different readers, who may be: inventors, patent attorneys, patent examiners, plaintiff's litigation counsel, defendant's litigation counsel, district judges, administrative patent judges, Federal

2. See, e.g., Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts? Rethinking Patent Claim Construction*, 157 U. PA. L. REV. 1743, 1745 (2009) [hereinafter Burk & Lemley, *Fence Posts*] (“Claim construction is sufficiently uncertain that many parties don’t settle a case until after the court has construed the claims, because there is no baseline for agreement on what the patent might possibly cover.”). But see Jeffrey A. Lefstin, *The Measure of the Doubt: Dissent, Indeterminacy, and Interpretation at the Federal Circuit*, 58 HASTINGS L.J. 1025, 1092 (2007) (concluding that “claim construction on the whole has been no less determinate than other aspects of patent law”).

3. JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 9 (2008).

4. See *id.* at 10–11.

5. See *infra* Part I.A.

6. Throughout this Article, the term “reader” refers to anyone who reads a patent claim.

7. Bounded rationality “refers to the obvious fact that human cognitive abilities are not infinite.” Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1477 (1998) (citation omitted).

8. See *infra* Part II.C.

Circuit judges, engineers, scientists, business people, investors, and others who may need to know the scope of a patent claim.

For readers who are in an adversarial relationship, behavioral influences can aggravate the difference in competing views of claim scope by prompting opposing parties to take more extreme positions.⁹ For readers with shared goals, the differences in their background knowledge or training might lead them to reach different estimates of claim scope.¹⁰ Behavioral influences may also contribute to reader variance within institutions, such as the federal courts (e.g., district judges vs. Federal Circuit judges) and the U.S. Patent & Trademark Office (PTO) (e.g., patent examiners vs. administrative patent judges), in light of situational differences.¹¹ It may also aggravate the variance in scope determinations between institutions, such as when a claim allowed by a patent examiner based on a narrow reading is subsequently litigated in federal court on a much broader reading, thereby depriving the public of the benefit of patent examination.¹²

The impact of cognitive biases and priors, along with the situational factors that may amplify their influence, cannot (as a practical matter) be eliminated from claim construction. However, it is worth exploring whether their effects could be mitigated, as the current claim interpretation regime appears to have been designed without regard to behavioral considerations. The interpretive canons presently used in federal court litigation, based on *Phillips v. AWH Corp.*,¹³ as well as the “broadest reasonable interpretation” (BRI) used by the PTO,¹⁴ are highly susceptible to behavioral influences because they require the close parsing¹⁵ of claim terms. Because parsing involves the exercise of discretion in selecting, weighing, and applying multiple interpretive sources and rules, it provides various opportunities for behavioral elements to affect the analysis.

To mitigate the influence of behavioral elements in claim construction, this Article recommends replacing the current claim construction regime—which entails extensive parsing of

9. See *infra* Part II.A.3.

10. See *infra* Part II.D.

11. See *infra* Part II.C.

12. See *infra* Parts II.A.2, II.B.1.

13. 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

14. See *infra* Part I.B.2.

15. As used in this Article, the word “parse” and its variants refer to the close, systematic analysis of text using the relevant canons of construction associated with that type of text.

claim language to divine the “plain and ordinary” meaning or the “broadest reasonable” one¹⁶—with an alternative rule for use across different institutions that involves minimal parsing and closely ties the scope of the claims to the content of the patent document. Such an interpretive rule may be less susceptible to behavioral influences as it would cabin the exercise of judgment. Moreover, the first-order approximation of claim scope under such a rule would closely hew to the disclosed embodiments, which the cognitive science literature suggests would likely correspond to the estimate of claim scope reached by the vast majority of the potential readers of a given patent¹⁷—who would be nonparsers¹⁸ (e.g., individuals who are not trained in legal analysis, such as engineers, scientists, business people, and investors), rather than parsers (e.g., attorneys and judges).

As it happens, there exists a rule of claim interpretation that resembles the proposed alternative rule: means-plus-function analysis under 35 U.S.C. § 112(f), whereby claim scope is limited to the structures disclosed in the patent document and their equivalents.¹⁹ However, under current Federal Circuit case law, § 112(f) may be applied only to claim limitations that recite a “function without reciting sufficient structure for performing that function,”²⁰ such as “means for communicating” or “communication mechanism” (as opposed to a term such as “computer network”). Accordingly, this Article proposes that means-plus-function analysis apply to *all* claim terms. Under this proposal, the default rule of construction may be more resistant (than either the *Phillips* methodology or BRI) to allowing behavioral elements to aggravate reader variance in claim interpretation. This is because a means-plus-function rule largely tracks what the bulk of the readers—who are nonparsers—are likely to do *naturally* and also cabins the extent to which the parsing readers may introduce interpretive variance beyond the disclosed embodiments. As a result, the first-order approximations of the boundaries of a patent claim reached by a lay technologist and someone with expertise in patent law may be closer under the

16. See *Phillips*, 415 F.3d at 1312–16 (discussing these canons of interpretation).

17. See *infra* Parts II, III.B.

18. As used in this Article, a “nonparser” is someone who does not apply the applicable canons of construction in ascertaining the meaning of text having legal significance.

19. See *infra* notes 227–33 and accompanying text.

20. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)).

proposed all-means-plus-function rule than under the current *Phillips*/BRI regime.

In evaluating the takeaways from this Article, it is worth noting that the influence of behavioral elements on the interpretation of text is not a problem unique to patent claims. Various parts of this Article may describe behavioral artifacts that resemble those encountered in statutory construction²¹ and contract interpretation.²² To the extent there may be any limitations on the applicability of any takeaways beyond patent law, they may arise from certain features idiosyncratic to the creation, structure, function, and enforcement of a patent. For example, the proposed solution²³ to mitigate behavioral effects in patent claim construction requires reliance on the patent's specification,²⁴ which is present in every patent document and must comply with certain statutory requirements governing its content.²⁵ The specification does not have an equivalent in either statutory construction or contract interpretation. Unlike a statute and its legislative history, the claims are actually part of the specification and the entire patent document is considered an integrated instrument.²⁶ And unlike a contract, the final form of

21. See, e.g., ADRIAN VERMEULE, *JUDGING UNDER UNCERTAINTY* 158, 178–79 (2006) (observing that judges engage in statutory or constitutional interpretation “under conditions of empirical uncertainty and bounded rationality,” and recommending that they “adopt interpretive precepts that are good enough . . . rather than attempting to produce the very best interpretive regime”); Jill C. Anderson, *Misreading Like a Lawyer: Cognitive Bias in Statutory Interpretation*, 127 HARV. L. REV. 1521, 1579 (2014) (“[F]indings from diverse branches of psychology suggest that legal misreading arises out of . . . various kinds of thinking errors.”); Adam M. Samaha, *Starting with the Text—On Sequencing Effects in Statutory Interpretation and Beyond*, 8 J. LEGAL ANALYSIS 439 (2016) (analyzing order effects in the use of interpretive sources).

22. See, e.g., Steven L. Harris, *Rules for Interpreting Incomplete Contracts: A Cautionary Note*, 62 LA. L. REV. 1279, 1283 (2002) (“Are the limitations on the use of usage of trade, course of dealing, and course of performance not strong enough to overcome possible preconceptions and cognitive biases?”); Lawrence Solan et al., Essay, *False Consensus Bias in Contract Interpretation*, 108 COLUM. L. REV. 1268, 1298 (2008) (“Our studies strongly suggest that both laypeople and judges are subject to false consensus bias in deciding whether nonprototypical situations fit within contractual language.”); Omri Ben-Shahar & Lior Jacob Strahilevitz, *Interpreting Contracts via Surveys and Experiments* 41 (Univ. of Chi. Law Sch. Coarse-Sandor Inst. for Law & Econ., Working Paper No. 791, 2017), <https://ssrn.com/abstract=2905873> (proposing use of surveys for contract interpretation to avoid cognitive and information biases of judges).

23. See *infra* Part III.

24. See *infra* Part I.A.

25. See 35 U.S.C. § 112(a) (2012) (setting forth the disclosure requirement).

26. See *id.* § 112(b) (“The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter

the specification and its associated claims are determined in an *ex parte* administrative proceeding (i.e., review by a patent examiner) that yields an instrument enforceable against the public.²⁷ Despite these differences, the analysis of the behavioral elements provided in this Article may be helpful in diagnosing and modeling problematic behavioral artifacts in other contexts.

This Article proceeds in multiple Parts. Part I situates the problem of behavioral influences within the rich literature on claim construction, and also summarizes the existing claim interpretation regime. Part II descriptively explores how certain behavioral elements, such as cognitive biases, priors, and situational considerations, may contribute to reader-dependence in assessments of claim scope. The specific behavioral elements discussed in this Article do not constitute an exhaustive set of all possible behavioral elements that might influence claim construction. Part III presents one possible solution to mitigate the influence of behavioral elements in claim construction: expanding the application of means-plus-function analysis to all claim terms. This Part also addresses potential implications and concerns and is followed by a brief Conclusion.

I. BACKGROUND

A. OVERVIEW OF CLAIM CONSTRUCTION ISSUES

A patent has several parts. The specification sets forth a detailed description of the invention in a manner sufficient to allow an ordinary artisan in the relevant technical field to make and use it.²⁸ A set of drawings is usually included to aid in the understanding of the subject matter disclosed.²⁹ At the end of the patent document are the claims, which define the scope—that is, the boundaries—of the invention.³⁰

During the lifecycle of a patent, its claims are crafted and later interpreted by a multitude of readers at different stages. To begin, an inventor talks to a patent attorney,³¹ who prepares

which the inventor or a joint inventor regards as the invention.” (emphasis added); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978 (Fed. Cir. 1995) (“The patent is a fully integrated written instrument.”), *aff’d*, 517 U.S. 370 (1996).

27. See *Markman*, 52 F.3d at 986.

28. 35 U.S.C. § 112(a).

29. *Id.* § 113.

30. *Id.* § 112(b)–(f).

31. Inventors may also be represented by patent agents, who are nonlawyers registered to practice before the PTO. To simplify the discussion, the term

a patent application that is filed at the PTO and is examined by a patent examiner.³² After the patent issues, it may be asserted by the patentee against an accused infringer.³³ In a patent suit, each party is represented by litigation counsel in federal court where the adjudicator is a district judge.³⁴ During litigation, the accused infringer might also challenge the validity of the patent through an administrative proceeding at the PTO (e.g., inter partes review) that is conducted by administrative patent judges at the Patent Trial and Appeal Board (PTAB).³⁵ On appeal from either the district court or the PTAB, Federal Circuit judges will review the scope of the claims in connection with adjudicating liability issues.³⁶ Outside of the litigation context, the patent may be reviewed by business people, engineers, investors, and others who might be making business decisions based on their impressions of what the scope of the claims might be.

The determination of claim scope is the key inquiry in every patent case (as well as in many transactions), as it underlies the assessment of whether a claim is valid and infringed. Claim construction is an exercise in exegesis involving the application of multiple—at times, conflicting³⁷—canons under Federal Circuit decisional law, as most recently restated in *Phillips v. AWH Corp.*³⁸ Claim construction has been the focus of considerable scholarly attention by virtue of its centrality in patent litigation and the difficulty of reliably ascertaining the boundaries of the invention.³⁹ Commentators have pointed to the Federal Circuit's reversal rate for district court claim constructions as a reflection

“patent attorney” as used in this Article also includes patent agents.

32. 35 U.S.C. § 131.

33. *Id.* § 281.

34. 28 U.S.C. § 1338(a) (2012) (“The district courts shall have original jurisdiction of any civil action arising under any Act of Congress relating to patents . . .”).

35. 35 U.S.C. § 311.

36. *Id.* § 141.

37. See John M. Golden, *Construing Patent Claims According to Their “Interpretive Community”: A Call for an Attorney-Plus-Artisan Perspective*, 21 HARV. J.L. & TECH. 321, 362 (2008) (“[H]istorically, case law and commentary on claim construction have been replete with such a mélange of conflicting canons that one can find *some* historical support for almost any interpretive methodology.”).

38. 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

39. A collection of representative sources is provided in J. Jonas Anderson & Peter S. Menell, *Informal Deference: A Historical, Empirical, and Normative Analysis of Patent Claim Construction*, 108 NW. U. L. REV. 1, 4 n.6 (2014).

of the uncertainty in determining claim scope.⁴⁰ According to one estimate, the reversal rate has ranged between a high of forty-four percent to a low of 16.5% on an annual basis.⁴¹

The literature contains a variety of explanatory theories for this uncertainty and proposals for its mitigation. Some have suggested that claim construction is inherently indeterminate.⁴² Others, including some Federal Circuit judges,⁴³ blame the *de novo* standard of review for claim constructions on appeal.⁴⁴ Some point to the schism within the Federal Circuit regarding

40. A number of empirical studies have analyzed the rate at which the Federal Circuit has reversed the district court's claim construction. *See, e.g., id.*, at 1–2; Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075, 1075 (2001); Shawn P. Miller, *"Fuzzy" Software Patent Boundaries and High Claim Construction Reversal Rates*, 17 STAN. TECH. L. REV. 809, 809 (2014); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1, 2 (2001); David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223, 223 (2008) [hereinafter Schwartz, *Practice*]; David L. Schwartz, *Pre-Markman Reversal Rates*, 43 LOY. L.A. L. REV. 1073, 1073 (2010).

41. Anderson & Menell, *supra* note 39, at 1.

42. *See, e.g.,* Burk & Lemley, *Fence Posts*, *supra* note 2, at 1745 (“[C]laim construction may be inherently indeterminate: it may simply be impossible to cleanly map words to things.”); Schwartz, *Practice*, *supra* note 40, at 259 (“Claim construction may be inherently indeterminate.”).

43. *See* Anderson & Menell, *supra* note 39, at 32–33 (describing disagreement among Federal Circuit judges regarding *de novo* review).

44. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1451 (Fed. Cir. 1998) (en banc) (“[C]laim construction, as a purely legal issue, is subject to *de novo* review on appeal.”). In recent years, *Cybor* was largely reaffirmed by the Supreme Court, which held that claim construction, as a question of law, is reviewed *de novo*, while any subsidiary factfinding by the district court is reviewed for clear error. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 836–39 (2015). Similarly, the PTAB's analysis of claim scope is reviewed *de novo*. *Straight Path IP Grp., Inc. v. Sipnet EU S.R.O.*, 806 F.3d 1356, 1360 (Fed. Cir. 2015) (“[W]e conduct a *de novo* review of the Board's determination of the broadest reasonable interpretation of the claim language.”).

the role of the specification in claim construction,⁴⁵ and the resulting panel dependence on appellate outcomes.⁴⁶ Others have proposed alternative claim construction methodologies, such as applying linguistic techniques,⁴⁷ or moving away from peripheral claiming⁴⁸ and returning to central claiming.⁴⁹ Some have suggested that patentees should be required to disclose in the specification additional information to aid in claim construction, such as a glossary of terms and a list of interpretive sources.⁵⁰

45. See, e.g., Greg Reilly, *Improviently Granted: Why the En Banc Federal Circuit Chose the Wrong Claim Construction Issue*, 80 U. CHI. L. REV. DIALOGUE 43, 45–46 (2013); R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105, 1111 n.19, 1138 tbl.1 (2004) [hereinafter Wagner & Petherbridge, *Federal Circuit Succeeding*]. Polk Wagner and Lee Petherbridge assigned the judges on the Federal Circuit to one of three factions based on their preferred claim construction methodology: (1) the “proceduralists,” who emphasize the ordinary meaning of the claim terms and follow a strict, rules-based hierarchy of interpretive sources; (2) the “holistics,” who emphasize the specification and the prosecution history as interpretive sources and apply a more flexible, case-specific analysis; and (3) the “swing judges,” who comprise a middle group. *Id.* Wagner and Petherbridge found that the proceduralist methodology was applied in a clear majority (63.1%) of the cases. *Id.* at 1170.

46. Wagner & Petherbridge, *Federal Circuit Succeeding*, *supra* note 45, at 1163 (“We find . . . that the individual membership and overall composition of a three-judge panel that decides an appeal has a statistically significant effect on the methodological approach used to analyze claim construction issues.”).

47. See, e.g., Kristen Osenga, *Linguistics and Patent Claim Construction*, 38 RUTGERS L.J. 61, 62–63 (2006).

48. This is modern peripheral claiming, which is distinct from the *traditional* (i.e., pre-Federal Circuit) principles of peripheral claiming, which, as chronicled by John Duffy, bear a greater resemblance to central claiming and means-plus-function analysis under 35 U.S.C. § 112(f). John F. Duffy, *Counterproductive Notice in Literalistic Versus Peripheral Claiming*, 96 B.U. L. REV. 1197, 1206, 1211 (2016). Throughout this Article, the term “peripheral claiming,” without any adjectives, will generally refer to the modern, literalistic peripheral claiming principles established by the Federal Circuit. To avoid ambiguity, references to *traditional* peripheral claiming will be made explicitly with the appropriate modifier.

49. See, e.g., Burk & Lemley, *Fence Posts*, *supra* note 2, at 1747; Jeanne C. Fromer, *Claiming Intellectual Property*, 76 U. CHI. L. REV. 719, 735–39 (2009). “Peripheral claiming,” which is the current system of claiming, defines the outermost boundary of the patentee’s invention, while “central claiming” sets forth the core concept (or the gist) of the patentee’s invention. Burk & Lemley, *Fence Posts*, *supra* note 2, at 1747. According to John Duffy, the current version of peripheral claiming, which is based on Federal Circuit precedent, is distinct from the traditional form of peripheral claiming as practiced in the pre-Federal Circuit era, which bears a greater resemblance to means-plus-function analysis. Duffy, *supra* note 48, at 1206.

50. See Joseph Scott Miller, *Enhancing Patent Disclosure for Faithful Claim Construction*, 9 LEWIS & CLARK L. REV. 177, 183–84 (2005).

Still others believe that generalist⁵¹ district judges may be poorly equipped to handle claim construction,⁵² and point to specialized courts⁵³ or expedited claim construction appeals⁵⁴ as potential solutions.

It is unclear which of the many theories surrounding the uncertainty in claim construction and the proposals for improving it are actually targeting its underlying problems, rather than the symptoms. Like the proverbial blind men touching different parts of an elephant, each of the various theories and proposals in the literature focuses on different aspects of the claim construction conundrum, which may have several underlying pathologies that are intertwined. To this body of literature, this Article contributes an exploration of another facet of the problem: the behavioral aspect. The complaint about indeterminacy being “inherent”⁵⁵ in claim interpretation suggests there might be an unconscious aspect to it,⁵⁶ such that an analytical inquiry through the lens of cognitive science and social psychology might be fruitful. The literature on the cognitive science and social psychology aspects of claim construction is relatively sparse and is largely limited to discrete sections in a handful of articles.⁵⁷ This Article synthesizes this scattered literature and expands on it to

51. See S. Jay Plager, *Abolish the Court of Federal Claims? A Question of Democratic Principle*, 71 GEO. WASH. L. REV. 791, 796–97 (2003) (observing that district judges are not patent specialists and most do not have scientific training).

52. See Moore, *supra* note 40, at 38.

53. See, e.g., Jay P. Kesan & Gwendolyn G. Ball, *Judicial Experience and the Efficiency and Accuracy of Patent Adjudication: An Empirical Analysis of the Case for a Specialized Patent Trial Court*, 24 HARV. J.L. & TECH. 393, 444 (2011). But see David L. Schwartz, *Courting Specialization: An Empirical Study of Claim Construction Comparing Patent Litigation Before Federal District Courts and the International Trade Commission*, 50 WM. & MARY L. REV. 1699, 1704 (2009) (reporting results of empirical study where “[t]he data do not reveal any evidence that the patent-experienced ALJs of the ITC are more accurate at claim construction than generalist district court judges”).

54. See Moore, *supra* note 40, at 39.

55. See *supra* note 42 and accompanying text.

56. Cf. Jeffrey A. Lefstin, *Claim Construction, Appeal, and the Predictability of Interpretive Regimes*, 61 U. MIAMI L. REV. 1033, 1058 (2007) [hereinafter Lefstin, *Interpretive Regimes*] (“The process of attaching meaning to a word, or associating a physical structure with a word, may be cognitively deeper and more primitive than the more abstract determinations demanded by patent law.” (footnote omitted)).

57. See, e.g., Fromer, *supra* note 49, at 763–67; Lefstin, *Interpretive Regimes*, *supra* note 56, at 1050–60; Gregory N. Mandel, *Patently Non-Obvious: Empirical Demonstration That the Hindsight Bias Renders Patent Decisions Irrational*, 67 OHIO ST. L.J. 1391, 1440–41 (2006).

provide a more detailed exploration of the behavioral factors that may influence how a reader interprets a claim, along with a specific proposal for mitigating them.

B. THE CURRENT CLAIM CONSTRUCTION REGIME

Currently, there are two systems of patent claim interpretation in use: (1) the claim construction methodology applied by federal district courts in accordance with *Phillips v. AWH Corp.*;⁵⁸ and (2) the “broadest reasonable interpretation” (BRI) standard used in PTO proceedings.⁵⁹ In both systems, the claims are to be construed from the perspective of a “person having ordinary skill in the art” (PHOSITA),⁶⁰ who is a technically skilled individual possessing an encyclopedic knowledge of all relevant prior art.⁶¹ When reading patent claims, the PHOSITA is assumed to be a careful, disinterested reader who, despite being untrained in the law, is unnaturally adept at exegesis.

1. The *Phillips* Methodology

The *Phillips* methodology applied by the district courts is a set of interpretive canons, some of which are patent specific while others are analogous to those for statutory construction and contract interpretation.⁶² The primary canons include the following: (1) unless the patentee acted as his own lexicographer,⁶³ the words of a claim are generally given their ordinary meaning as understood by a skilled artisan at the time of invention;⁶⁴ (2) the claims should be read in light of the specification;⁶⁵

58. 415 F.3d 1303 (2005) (en banc).

59. U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2111 (9th ed. Rev. 25, Nov. 2015) [hereinafter *MPEP*], <https://www.uspto.gov/web/offices/pac/mpep/s2111.html>; 37 C.F.R. § 42.100(b) (2017).

60. See *Phillips*, 415 F.3d at 1313 (requiring PHOSITA perspective for *Phillips* methodology); *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (requiring PHOSITA perspective for BRI). The phrase “person having ordinary skill in the art” is found in 35 U.S.C. § 103 (2012). The corresponding acronym, PHOSITA, is a common shorthand expression used in patent law (and throughout this Article) to denote the concept of the ordinarily skilled artisan.

61. See *In re Winslow*, 365 F.2d 1017, 1020 (C.C.P.A. 1966).

62. See Kelly Casey Mullally, *Patent Hermeneutics: Form and Substance in Claim Construction*, 59 FLA. L. REV. 333, 339 n.33 (2007) (“[C]ourts have found it useful to rely on principles of contract and statutory interpretation for various aspects of claim construction. Which discipline presents the most useful analogy depends on the precise issue at hand.”).

63. *Phillips*, 415 F.3d at 1319.

64. *Id.* at 1312–13.

65. *Id.* at 1315–16.

and (3) the limitations and features of the illustrative embodiments shown in the specification should not be imported into the claims.⁶⁶ Because these canons are often in tension, emphasizing certain ones over others can affect the extent to which the scope of a claim may extend beyond the embodiments disclosed in the specification. According to Polk Wagner and Lee Petherbridge, there exist two distinct camps of Federal Circuit judges who have different views on the relative importance of these canons: (1) the “proceduralists,” who emphasize the “plain and ordinary” meaning of the claim terms and follow a strict, rule-based hierarchy of interpretive sources; and (2) the “holistics,” who focus on the specification and the prosecution history and apply a more flexible, case-specific analysis.⁶⁷

Some commentators view the proceduralist approach as the superior methodology that better supports the public notice function of a patent claim.⁶⁸ However, the emphasis on finding the “plain and ordinary” meaning may entail a heavier reliance on extrinsic evidence (such as dictionaries), which may provide more opportunities for the introduction of bias than the use of intrinsic evidence, given the “virtually unbounded universe of potential extrinsic evidence of some marginal relevance that could be brought to bear on any claim construction question.”⁶⁹ Indeed, in some cases, the choice of dictionary might be outcome determinative.⁷⁰

But the holistic approach may also be problematic. There is a fine line between reading a limitation into a claim and reading that claim in light of the specification. These complementary canons relating to the use of the specification in claim construction have created mischief because it is difficult to apply one canon reliably without running afoul of the other.⁷¹ Depending

66. *Id.* at 1323.

67. Wagner & Petherbridge, *Federal Circuit Succeeding*, *supra* note 45.

68. See R. Polk Wagner & Lee Petherbridge, *Did Phillips Change Anything? Empirical Analysis of the Federal Circuit’s Claim Construction Jurisprudence*, in *INTELLECTUAL PROPERTY AND THE COMMON LAW* 123, 143–45 (Shyamkrishna Balganesh ed., 2013).

69. *Phillips*, 415 F.3d at 1318.

70. 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, 876 (2005) (“[D]ifferences among different dictionaries can . . . generate different claim construction analyses.”).

71. Burk & Lemley, *Fence Posts*, *supra* note 2, at 1771–72 (“In practice, this set of rules is nearly impossible to follow, since no one can really tell when they have crossed the line from interpreting the claim in light of the specification to reading forbidden elements from the specification into the claim.”).

on his agenda or priors, the reader of a claim can emphasize one canon over the other to achieve a particular result. As such, the specification, despite being “the single best guide to the meaning of a disputed term,”⁷² may be selectively relied upon to varying degrees to suit the reader’s purposes.

Whether one is a proceduralist, a holistic, or somewhere in between, the *Phillips* methodology requires one to engage in the act of parsing claim language, which is a cognitively intensive process that entails analyzing claim terms and exercising judgment on the selection of competing interpretive canons and sources. As discussed below, this process may leave a reader susceptible to allowing various behavioral elements to affect his interpretation of a claim.⁷³

2. Broadest Reasonable Interpretation

The PTO’s method of interpreting claims is the “broadest reasonable interpretation” (BRI),⁷⁴ which is used by patent examiners during examination⁷⁵ and by PTAB judges during administrative proceedings for reviewing the validity of issued patents, such as inter partes review.⁷⁶ BRI is supposed to make it easier to invalidate a claim by making it broader in scope than it otherwise would be when construed by a district court.⁷⁷

72. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (“[T]he specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.”).

73. See *infra* Parts II, III.A.

74. The term “broadest reasonable *construction*” is used as well, and is used interchangeably with “broadest reasonable interpretation.” *E.g.*, *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1276–77 (Fed. Cir. 2015) (“This court has approved of the broadest reasonable *interpretation* standard in a variety of [PTO] proceedings . . . [W]e have cited the long history of the PTO’s giving claims their broadest reasonable *construction*.” (emphases added) (footnote omitted)).

75. *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

76. 37 C.F.R. §42.100(b) (2017) (specifying use of “broadest reasonable construction” in inter partes review proceedings). Other PTO administrative proceedings where BRI is used include reexaminations, see *In re Yamamoto*, 740 F.2d 1569, 1571–72 (Fed. Cir. 1984), reissues, see *In re Reuter*, 670 F.2d 1015, 1019 (C.C.P.A. 1981), and interferences, see *Yorkey v. Diab*, 605 F.3d 1297, 1300–01 (Fed. Cir. 2010).

77. *In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000) (noting that applying the “broadest reasonable interpretation” standard “serves the public interest by reducing the possibility that claims, finally allowed, will be given broader scope than is justified” (internal quotation marks and citation omitted)); see also Dawn-Marie Bey & Christopher A. Cotropia, *The Unreasonableness of the Patent Office’s “Broadest Reasonable Interpretation” Standard*, 37 AIPLA Q.J. 285,

BRI does not correspond to the broadest *possible* meaning.⁷⁸ As contemplated by the Federal Circuit, BRI is “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.”⁷⁹ According to the Manual of Patent Examining Procedure (MPEP)—the PTO’s reference manual for patent examination⁸⁰—BRI requires that the words of a claim be given their “plain meaning,” which is the ordinary and customary meaning known to a PHOSITA, unless it would be inconsistent with the specification (such as when the applicant has acted as his own lexicographer or if there is a disclaimer).⁸¹ While the ordinary and customary meaning may be gleaned from “a variety of sources, including the words of the claims themselves, the specification, drawings, and prior art,” it is improper to import limitations from the specification into the claims when applying BRI.⁸²

Notably, these characteristics of BRI resemble the *Phillips* methodology applied by the district courts,⁸³ with some commentators observing that BRI is materially indistinguishable⁸⁴ from the *Phillips* methodology.⁸⁵ According to one estimate by PTAB

303 (2009) (“The requirement that the USPTO give the claim language its ‘broadest’ reasonable interpretation necessarily contemplates a larger resulting claim scope than a district court would determine under the normal interpretation methodology without the ‘broadest’ lens.”).

78. *MPEP*, *supra* note 59, at 2100-37.

79. *Morris*, 127 F.3d at 1054.

80. A description of the purpose of the MPEP is provided in its Foreword page. *MPEP*, *supra* note 59.

81. *Id.* § 2111.01.

82. *Id.*

83. *See* *Bey & Cotropia*, *supra* note 77, at 309 (“[S]ection 2111 . . . recites the same methodology used in district courts to interpret claims.”). *MPEP* § 2111—2111.05 and the PTAB opinions, which tend to lay out the BRI standard in detail, cite Federal Circuit claim construction cases that are appeals from district court litigation.

84. Under this view, the primary difference between them would lie not in any interpretive canons, but rather in the application of the presumption of validity: when there is an ambiguity, a district court may construe the claim so as to preserve its validity (as a last resort), *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1327 (Fed. Cir. 2005), whereas an examiner applying BRI does not, because the presumption of validity is inapplicable to any proceedings at the PTO, *see In re Etter*, 756 F.2d 852, 855–59 (Fed. Cir. 1985) (en banc).

85. Brief of Amicus Curiae Paul R. Michel in Support of Neither Party at 8, *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131 (2016) (No. 15-446) (“With the exception of looking to disclaimers in the prosecution history under *Phillips*, but

Lead Judge Michael Tierney, the choice between BRI and the *Phillips* methodology would not change the result in ninety percent of cases.⁸⁶ However, other commentators have characterized BRI as a distinct interpretive process—wholly separate from the *Phillips* methodology used by the district courts—that is “incurably ambiguous” and “severely lacking.”⁸⁷ The description of BRI in the MPEP has been criticized for vagueness, as it apparently lists the general principles of the *Phillips* methodology without elaborating on “the specifics of the BRI standard unique to the USPTO.”⁸⁸ Indeed, some have argued for the elimination of BRI in favor of having the PTO apply the same interpretive methodology as the district courts.⁸⁹

Regardless of which view of BRI is correct, both views describe BRI as a process of interpretation, which, like the *Phillips* methodology, requires the reader to parse claim terms using a variety of interpretive sources and rules. As explored in the next Section, this need for parsing may introduce opportunities for behavioral elements to influence the analysis.

II. THE BEHAVIORAL ELEMENTS

Currently, patent claim interpretation (whether under *Phillips* or BRI) is a highly analytical endeavor that requires a reader to interpret text through the exercise of judgment and discretion in the selection of the pertinent interpretive sources, the appropriate interpretive canons, and the manner of analysis. As discussed below, the exercise of judgment and discretion in the course of parsing claim language may provide opportunities

not under BRI, these standards are basically the same”); Brief of Amicus Curiae Unified Patents Inc. in Support of Respondent at 27, *Cuozzo Speed Techs., LLC*, 136 S. Ct. 2131 (No. 15-446) (“[T]here is little difference between BRI and a *Phillips* claim construction . . . if properly applied, these tools should lead to identical constructions, whether they are made in the PTO from the point of view of examination or in district court from the point of view of litigation.”); Scott A. McKeown, *BRI and Phillips Are No Different—Unified Patents Responds*, IPWATCHDOG (Apr. 17, 2016), <http://www.ipwatchdog.com/2016/04/17/bri-phillips-no-different/id=68340>.

86. Joseph Marks, *PTAB Chief Judge: Don't Sweat Cuozzo*, 92 PAT. TRADE-MARK & COPYRIGHT J. (BNA) 861, 92 PTCJ 2270 (July 22, 2016).

87. See, e.g., Bey & Cotropia, *supra* note 77, at 288.

88. *Id.* at 309–10.

89. See, e.g., Michael Risch, *The Failure of Public Notice in Patent Prosecution*, 21 HARV. J.L. & TECH. 179, 180 (2007) (arguing for “the abandonment of the ‘broadest reasonable construction’ rule for interpreting claims in pending patent applications” and proposing that “pending applications . . . be construed using the same rule used in litigation”).

for cognitive biases, priors, and situational considerations to affect the end result, leaving claims susceptible to being treated as a “nose of wax.”⁹⁰ This can yield highly divergent assessments of claim scope when the same interpretive methodology (e.g., the *Phillips* methodology in district court litigation) is applied to the same claim by two different readers, each of whom brings his own behavioral “baggage” to the analysis.

This Part endeavors to unpack a reader’s behavioral “baggage” by providing an overview of the various behavioral elements and a discussion of how they might impact claim interpretation. It is worth noting that each behavioral element may not necessarily operate alone. Indeed, a reader may have multiple behavioral elements interact synergistically while construing a claim. In some cases, one behavioral element may mute or counteract the influence of another behavioral element.

In organizing the discussion, the behavioral elements are classified into three broad categories: (1) heuristics and cognitive biases (i.e., unconscious decision-making); (2) priors (i.e., the reader’s background knowledge and attitudes); and (3) situational considerations (i.e., the impact of the reader’s environment). The specific behavioral elements discussed in this Article do not constitute an exhaustive catalog, but instead serve to highlight what are likely to be the primary behavioral influences as suggested by various empirical and experimental studies relating to the processes and circumstances under which patent claims are construed.

A. HEURISTICS AND COGNITIVE BIASES

According to a model developed by Daniel Kahneman and others,⁹¹ decision-making is a cognitive operation handled by two systems that coexist in the mind: “System 1,” which is the unconscious, intuitive, and impressionistic decision-making process that operates quickly (if not automatically); and “System 2,”

90. The Federal Circuit has used this phrase to express concern with attempts by parties to twist the meaning of the claims to serve a particular purpose. See *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001) (“A patent may not, like a ‘nose of wax,’ be twisted one way to avoid anticipation and another to find infringement.” (quoting *Sterner Lighting, Inc. v. Allied Elec. Supply, Inc.*, 431 F.2d 539, 544 (5th Cir. 1970))).

91. See generally DANIEL KAHNEMAN, THINKING, FAST AND SLOW (2011) (synthesizing several decades’ worth of psychological research on judgment and decision-making).

which is the conscious, deliberative, and effortful decision-making process that operates more slowly.⁹² System 1 relies heavily on heuristics, which are mental shortcuts people use unconsciously to process complex information and manage uncertainty.⁹³ In general, a heuristic operates by substituting a difficult question with an easier one.⁹⁴ This can lead to an imperfect answer, which, depending on the circumstances, may be adequate or erroneous.⁹⁵ When heuristics yield errors, they can be systematic in nature, giving rise to cognitive biases.⁹⁶ System 2, which allows for self-criticism and self-reflection, has the ability to resist, question, and correct the conclusions reached by the heuristics of System 1.⁹⁷ However, System 2 will often adopt or ratify the answers provided by System 1, especially if the former is lazy or weak, or if emotions are involved.⁹⁸ In essence, a decision reached through the unconscious operation of a heuristic via System 1 may become the subject of conscious deliberation and eventual justification via System 2.

In claim construction, different results may be obtained depending on the extent to which the answer provided by System 1 is modified by System 2. This dynamic (and terminology) will appear throughout this Article.

1. Anchoring and Availability

When construing a claim, a reader may consult, seek, or be provided with information from a variety of sources in support of that task. Cognitive biases may contribute to reader-dependence in claim interpretation when different readers of the same claim work with different information sets. As Jeffrey Lefstin

92. *Id.* at 20–21.

93. See Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 *SCI.* 1124, 1124 (1974); see also KAHNEMAN, *supra* note 91, at 98 (“The technical definition of *heuristic* is a simple procedure that helps find adequate, though often imperfect, answers to difficult questions.”).

94. KAHNEMAN, *supra* note 91, at 97–99.

95. *Id.* at 98 (“There is a heuristic alternative to careful reasoning, which sometimes works fairly well and sometimes leads to serious errors.”).

96. Tversky & Kahneman, *supra* note 93 (“In general, these heuristics are quite useful, but sometimes they lead to severe and systematic errors.”).

97. KAHNEMAN, *supra* note 91, at 99 (“System 2 has the opportunity to reject [the] intuitive [System 1] answer, or to modify it by incorporating other information.”).

98. *Id.* (“[A] lazy System 2 often follows the path of least effort and endorses a heuristic answer without much scrutiny of whether it is truly appropriate.”); see also *id.* at 103 (“In the context of attitudes . . . System 2 is more of an apologist for the emotions of System 1 than a critic of those emotions . . .”).

has observed, for a given claim construction issue, the information the litigators have reviewed, the district judge has considered, and the Federal Circuit judges have been presented with on appeal may differ in quantity, quality, order, and/or substance because the information available to each of these three types of readers has been successively filtered and rearranged for brevity, clarity, relevance, and/or admissibility as the litigation progresses.⁹⁹

Similarly, in proceedings at the PTO, the inventor, the patent attorney, the examiner, and the PTAB judges all work with different information sets relating to the same claim when evaluating its scope under BRI. In addition to the successive filtering and rearranging of information, different information sets may also result from differences in the nature of the proceedings: as between an ex parte proceeding (e.g., patent examination) and an adversarial one (e.g., a PTAB postgrant proceeding), the latter type of proceeding allows the reader to be exposed to a wider universe of possible claim interpretations.

Such variations in information sets for the same claim construction issue can lead different readers to reach different constructions as a result of System 1 processes such as anchoring and the availability heuristic. Anchoring occurs when a person's judgment is heavily influenced by some initial piece of information received.¹⁰⁰ For example, judges and juries are prone to treating an initial damages estimate as a starting point that materially influences the ultimate amount awarded.¹⁰¹ In patent cases, anchoring may contribute to the formulation of a claim construction that is heavily influenced by the particular features

99. Lefstin, *Interpretive Regimes*, *supra* note 56, at 1050–53.

100. Tversky & Kahneman, *supra* note 93, at 1128.

101. See, e.g., Jennifer K. Robbennolt & Christina A. Studebaker, *Anchoring in the Courtroom: The Effects of Caps on Punitive Damages*, 23 LAW & HUM. BEHAV. 353, 367 (1999) (finding that “as the level of the [punitive damages] cap increased, the size and variability of the awards increased as well”); Andrew J. Wistrich et al., *Can Judges Ignore Inadmissible Information? The Difficulty of Deliberately Disregarding*, 153 U. PA. L. REV. 1251, 1291 (2005) (reporting that “the high-anchor judges gave substantially higher awards and the low-anchor judges gave substantially lower awards”).

of the accused device,¹⁰² which, under Federal Circuit law, cannot be used to construe claims.¹⁰³ Although the Federal Circuit has instructed trial judges to “not prejudge the ultimate infringement analysis by construing claims with an aim to include or exclude an accused product or process,”¹⁰⁴ this admonition may not effectively guard against anchoring—which operates unconsciously—once the details of the accused device are presented to the court. Indeed, according to the phenomenon known as the “curse of knowledge,” information, once learned, can be difficult to ignore.¹⁰⁵ Studies by Jeffrey Rachlinski, Andrew Wistrich, and Chris Guthrie suggest that judges who are exposed to inadmissible or irrelevant information may be unconsciously influenced by it in later decisions—even if they had issued an earlier ruling to exclude the same information.¹⁰⁶ Accordingly, if the initial accused product had been substituted with another by the time the case went up on appeal or if the patentee had filed a parallel suit to assert the same claim against a different accused product in a second court, then the district judge in the first court, the Federal Circuit judges, and the district judge in the second court could each formulate different constructions for the same claim that are anchored to different accused products first seen in their respective tribunals.

The availability heuristic refers to the tendency of people to make judgments regarding the likelihood of an event or the merits of an idea based on information that comes to mind easily, as opposed to items that are more difficult to recall.¹⁰⁷ By way of

102. *E.g.*, *NeoMagic Corp. v. Trident Microsystems, Inc.*, 287 F.3d 1062, 1074 (Fed. Cir. 2002) (“NeoMagic argues, and we agree, that the court arrived at the constant voltage definition by examining the BIAS line of the accused device and, in effect, construing the claims to exclude it.”).

103. *SRI Int’l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1118 (Fed. Cir. 1985) (en banc) (“A claim is construed in the light of the claim language, the other claims, the prior art, the prosecution history, and the specification, *not* in light of the accused device.”).

104. *Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1326 (Fed. Cir. 2006).

105. See Colin Camerer et al., *The Curse of Knowledge in Economic Settings: An Experimental Analysis*, 97 J. POL. ECON. 1232, 1232 (1989) (“Better-informed agents are unable to ignore private information even when it is in their interest to do so; more information is not always better.”).

106. See, e.g., Chris Guthrie, *Misjudging*, 7 NEV. L.J. 420, 422–28 (2007).

107. Tversky & Kahneman, *supra* note 93, at 1127. Although early research by Daniel Kahneman and Amos Tversky relating to the availability heuristic focused on its effects in judging frequency and event likelihoods, see *id.*, it has since been expanded to “social judgments in general.” Robert M. Reyes et al., *Judgmental Biases Resulting from Differing Availabilities of Arguments*, 39 J.

illustration, an argument presented in a vivid manner during trial is likely to have a greater impact on a juror's assessment of the case than if the same argument had been presented less memorably.¹⁰⁸ Given that patent-related proceedings at the PTO or in litigation are often complex and detail-intensive,¹⁰⁹ information that is readily available in memory or otherwise salient may disproportionately influence how a claim is construed. In addition, the presentation of claim construction arguments in a highly compact, concentrated form within a relatively short period of time (e.g., a Federal Circuit appeal or a PTAB postgrant proceeding), as opposed to a sequential, drawn-out, evolving process (e.g., district court litigation or patent prosecution),¹¹⁰ could lead to different adjudicated assessments of claim scope, depending on the extent to which the earliest or the most recently presented information achieves salience through primacy or recency effects, respectively.¹¹¹

2. Representativeness and Stereotyping

The tendency of people to make systematic errors in judgment regarding whether an item, X, is a member of a class, Y, has been attributed to the representativeness heuristic,¹¹² which is grounded in the tendency to stereotype.¹¹³ This cognitive bias

PERSONALITY & SOC. PSYCHOL. 2, 3 (1980); *see also* KAHNEMAN, *supra* note 91, at 142 (observing that other researchers have expanded the notion of availability as a heuristic to contexts involving judging the importance of an idea by the fluency of recall).

108. Reyes et al., *supra* note 107, at 6 (reporting results of mock trial experiment in which "arguments that were disproportionately recallable in memory had a correspondingly disproportionate impact on judgments of apparent guilt").

109. *See* Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?*, 79 N.C. L. REV. 889, 933 (2001) (reporting data suggesting that "patent cases are more complex than the mass of civil case filings"); 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) (statement of Hon. Patti B. Saris) ("Patent litigation is like the neurosurgery of litigation: it is hard scientifically and it is hard legally.").

110. Lefstin, *Interpretive Regimes*, *supra* note 56, at 1056–57 (outlining order effects in claim construction).

111. A classic experiment on primacy and recency is provided in Norman Miller & Donald T. Campbell, *Recency and Primacy in Persuasion as a Function of the Timing of Speeches and Measurements*, 59 J. ABNORMAL & SOC. PSYCHOL. 1 (1959) (using trial simulation to study the relationship between primacy and recency effects). A collection of citations reflecting the rich literature on this subject is provided in Lefstin, *Interpretive Regimes*, *supra* note 56, at 1056 n.90.

112. *See* KAHNEMAN, *supra* note 91, at 151–52, 156–59.

113. *See id.* at 156–59, 168.

arises when a person fails to evaluate whether X has the necessary, essential characteristics of Y, and instead focuses on the degree to which X resembles a stereotypical member of class Y.¹¹⁴ For example, when people are asked to think about “birds” as a category, the stereotype is a robin, such that flightless birds like penguins and ostriches are not associated as strongly with that category.¹¹⁵ Stereotyping is a System 1 process whereby categories are represented by “prototypical exemplars,” in which “we hold in memory a representation of one or more ‘normal’ members of each of these categories.”¹¹⁶ Because System 1 processes occur unconsciously and automatically,¹¹⁷ the deliberative process of System 2 may be necessary to go beyond the initial answer provided by stereotyping to properly categorize nonstereotypical items.¹¹⁸

In the interpretation of claims, the effect of stereotyping may lead a reader to interpret a claim more narrowly than warranted under the current claim construction regime. In most instances, the stereotype that represents the scope of a claim would be the preferred embodiment of the invention described in the specification. If the reader’s System 2 is weak, the reader may not effectively parse the claim language to cover nonstereotypical items beyond the preferred embodiment. That is, a reader who is unable to fully engage in System 2 deliberation to methodically parse the claim language (whether because of time constraints or lack of training in exegesis) may unconsciously rely on the preferred embodiment as the mental representation of the scope of a particular claim, thereby substantially narrowing its scope. In this manner, it is possible that a time-pressed examiner may be unconsciously comparing the preferred embodiment—rather than the full scope of the claim—to the prior art, which would make it less likely that a claim will be found anticipated or obvious. Likewise, a reader, such as an engineer, who is unschooled in the principles of claim construction may reach the conclusion that there is no infringement based on a compar-

114. *See id.* at 151–52, 156–59, 168.

115. Eleanor Rosch, *Cognitive Representations of Semantic Categories*, 104 J. EXPERIMENTAL PSYCHOL.: GEN. 197–98, 232 (1975).

116. KAHNEMAN, *supra* note 91, at 168; *see also* Rosch, *supra* note 115, at 225 (finding that “cognitive representations of categories appeared to be more similar to the good examples than the poor examples”).

117. KAHNEMAN, *supra* note 91, at 20–21.

118. *Cf. id.* (discussing how System 2 may interact with System 1).

ison of the accused product and the preferred embodiment, rather than the full scope of the claims according to the *Phillips* methodology.

Notably, the nature of the claim language itself might aggravate the tendency of readers to rely on the representativeness heuristic or stereotyping. Research suggests that concrete text is more memorable and more readily recalled than abstract text.¹¹⁹ For example, in a study comparing sentence pairs such as “[t]he tribal marriage customs fascinated the tourists” and “[t]he traditional customs fascinated the tourists,” the former concrete version was recalled with greater accuracy than the latter abstract version.¹²⁰ This result holds across a variety of different subject matter, including technical information.¹²¹ This suggests that the preferred embodiment of the invention as set forth in the specification might be easier to recall than the claim language—which, by its very nature, is an abstract description of the invention¹²² and thus imposes a higher cognitive load on the reader, as it must be parsed to form a mental representation. As Doug Lichtman has noted, “someone skilled in the art might find it easier to read simple, concrete claim language (‘shoelace’) rather than more abstract expressions (‘mechanism by which to

119. See ALLAN PAIVIO, *IMAGERY AND VERBAL PROCESSES* 184 (1971) (reviewing studies suggesting that “recognition memory is a direct function of stimulus concreteness: Recognition increases from abstract words, to concrete words, to pictures”); V. M. Holmes & J. Langford, *Comprehension and Recall of Abstract and Concrete Sentences*, 15 *J. VERBAL LEARNING & VERBAL BEHAV.* 559, 563 (1976) (reporting results demonstrating that “[c]oncrete sentences were comprehended significantly faster than abstract sentences”); Mark Sadoski et al., *Impact of Concreteness on Comprehensibility, Interest, and Memory for Text: Implications for Dual Coding Theory and Text Design*, 85 *J. EDUC. PSYCHOL.* 291, 301 (1993) (“Immediate and delayed recall of sentences and paragraphs of varying lengths revealed that concrete information was consistently and overwhelmingly better recalled than abstract information,” whereby “concrete sentences were recalled about twice as well as abstract sentences both immediately and 5 days later.”).

120. Richard C. Anderson et al., *Two Faces of the Conceptual Peg Hypothesis*, 3 *J. EXPERIMENTAL PSYCHOL.: HUM. LEARNING & MEMORY* 142, 143, 148 (1977).

121. See Mark Sadoski et al., *Engaging Texts: Effects of Concreteness on Comprehensibility, Interest, and Recall in Four Text Types*, 92 *J. EDUC. PSYCHOL.* 85, 90–91 (2000) (reporting results of an experiment showing that for science and math text, “[c]oncrete exposition was recalled 1.35 times as much as abstract exposition”).

122. See Kevin Emerson Collins, *Bilski and the Ambiguity of “An Unpatentable Abstract Idea,”* 15 *LEWIS & CLARK L. REV.* 37, 50 (2011) (“Abstraction in the language of a patent claim is simply generality in the claim language. Here, claims become more abstract by describing an invention with more and more generality, and thus less and less detail, and encompassing a larger and larger set of distinct embodiments.” (footnotes omitted)).

bind tightly around the foot') that are in fact technically superior."¹²³

3. Egocentric Biases and Cognitive Dissonance

How a person interprets information may be subject to "egocentric" or "self-serving" biases, which can be reflected in, for example, an overestimation of one's own abilities or an inflated view of the merits of one's positions.¹²⁴ Experimental studies suggest that lawyers' views of the strengths or weaknesses of a case are heavily influenced by which side they represent.¹²⁵ Relatedly, new information may be interpreted unconsciously in a way that supports or confirms preexisting beliefs; this is known as "confirmation bias."¹²⁶

In the context of claim construction, egocentric biases may be pronounced in any reader who has to advocate for or otherwise justify his or her interpretation. This is commonly reflected in the behaviors of the respective litigation counsel for the patentee and that of the accused infringer, both of whom parse the claim language using a selection of interpretive canons and sources that cast their respective positions in the best possible light. Although some variance is to be expected in the claim construction positions taken by opposing litigators who are performing their jobs, egocentric biases can lead them to propose extreme or unreasonable constructions that may involve "arguing vehemently about the thinnest shades of meanings of a patent's [claim] terms."¹²⁷

123. See Doug Lichtman, *Substitutes for the Doctrine of Equivalents: A Response to Meurer and Nard*, 93 GEO. L.J. 2013, 2015 (2005).

124. See Guthrie, *supra* note 106, at 435–36.

125. See, e.g., Linda Babcock et al., *Biased Judgments of Fairness in Bargaining*, 85 AM. ECON. REV. 1337, 1341 (1995) (finding that "There was a strong tendency toward self-serving judgments of fairness and predictions of the judge's award when subjects knew their roles").

126. See Charles G. Lord et al., *Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence*, 37 J. PERSONALITY & SOC. PSYCHOL. 2098, 2106 (1979) ("Subjects' decisions about whether to accept a study's findings at face value or to search for flaws . . . seemed to depend . . . on whether the study's results coincided with their existing beliefs."); Raymond S. Nickerson, *Confirmation Bias: A Ubiquitous Phenomenon in Many Guises*, 2 REV. GEN. PSYCHOL. 175, 175 (1998) (defining confirmation bias as "unwitting selectivity in the acquisition and use of evidence").

127. Jessie Seyfer, *Patent Judges Buried in Paper*, RECORDER (Mar. 5, 2007).

The work product of judges may also be influenced by self-serving biases, as they may have a strong interest in taking positions consistent with their prior rulings.¹²⁸ Indeed, the desire for consistency might be a factor in how the PTAB analyzes claim scope during inter partes review. Because the same three-judge PTAB panel decides whether to institute an inter partes review proceeding *and also* decides the ultimate issue of patentability if a proceeding is instituted, some observers have attributed the PTAB's high "kill rate"¹²⁹ to possible confirmation bias on the part of the panel judges, as a finding of unpatentability would be consistent with their decision to institute review.¹³⁰ Cognitive dissonance theory¹³¹ predicts that PTAB judges could be prone to discounting evidence and claim construction arguments that are inconsistent with their institution decisions.¹³² To the extent that confirmation bias may affect how PTAB judges construe claims during an inter partes review proceeding that has been instituted, the bias would likely exist toward interpreting claims broadly, which would increase the likelihood of an invalidity finding.

128. See ROBERT B. CIALDINI, *INFLUENCE: THE PSYCHOLOGY OF PERSUASION* 60 (2007) (noting the commonly-held perception that inconsistency is an undesirable personality trait); *id.* at 61 (observing that consistency is "a convenient, relatively effortless, and efficient method for dealing with [complexity]"); see also Jeremy W. Bock, *Restructuring the Federal Circuit*, 3 N.Y.U. J. INTELL. PROP. & ENT. L. 197, 221 (2014) [hereinafter Bock, *Restructuring*] ("[Inconsistency] could expose [judges] to the risk of losing face. . . . At the same time, it may take less work for a judge to default to his or her prior position . . .").

129. As of June 30, 2016, in inter partes review proceedings for which there was a final written decision, all claims were found unpatentable in seventy percent of cases; some (but not all) claims were found unpatentable in fifteen percent of cases; and none of the claims were found unpatentable in fourteen percent of cases. PATENT TRIAL AND APPEAL BOARD STATISTICS, U.S. PATENT & TRADEMARK OFFICE 10 (June 30, 2016), <http://www.uspto.gov/sites/default/files/documents/2016-6-30%20PTAB.pdf>.

130. See, e.g., *Ethicon Endo-Surgery, Inc. v. Covidien LP*, 826 F.3d 1366 (Fed. Cir. 2016) (Newman, J., dissenting from denial of rehearing en banc) ("[A]ssigning the same PTAB panel to both institute and conduct an *inter partes* review . . . has the taint of prejudice. Many commentators, including the amici curiae in this case, point to the PTO's own statistics as evidence of prejudice, calling the merits phase 'a largely rubber-stamp proceeding.'" (internal citation omitted)).

131. See LEON FESTINGER, *A THEORY OF COGNITIVE DISSONANCE* 2–3 (1957).

132. Cf. Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763, 780–81 (2002) (applying postdecision cognitive dissonance theory to argue that opposition proceedings should occur pregrant in order minimize the cognitive dissonance of PTO personnel).

B. PRIORS

A reader's background, experiences, and attitudes—in a word, her “priors”¹³³—are the building blocks for her schemas, which may shape how she interprets a claim.¹³⁴ A schema is one's “organized knowledge of the world” that provides a contextual framework for interpreting new information regarding a particular subject.¹³⁵ An individual has numerous schemas covering a variety of topics. To illustrate how schemas operate, consider the following sentence: “Number 37 knocked the cover off the ball.”¹³⁶ To someone who is familiar with the game of baseball, this sentence may be readily interpreted as a baseball player wearing number thirty-seven on his jersey who hit the ball really hard, possibly scoring a home run.¹³⁷ One who has a mental framework of details typically associated with baseball games—that is, a “baseball schema”—can readily comprehend this sentence, whereas someone without any familiarity with baseball may either have difficulty understanding the sentence without additional information, or, alternatively, may have a different schema that would allow him or her to reach a completely different interpretation (e.g., robotic sewing machine number thirty-seven malfunctioned and damaged a ball by ripping off its cover).¹³⁸

In the context of claim construction, priors and schemas may vary considerably from reader to reader, and their impact on interpretation is discussed below.

133. In the literature, the term “priors” (or “prior”) is often used in the context of discussing Bayes's Theorem. *See, e.g.*, Jonathan J. Koehler, *On Conveying the Probative Value of DNA Evidence: Frequencies, Likelihood Ratios, and Error Rates*, 67 U. COLO. L. REV. 859, 863–64 (1996) (“According to Bayesian logic, one's prior beliefs (i.e., the beliefs one holds prior to the introduction of new evidence) are combined with a quantitative measure of the probative value of the new evidence to form posterior beliefs.”). More generally, the term “priors” is also used in the literature to refer to a person's “underlying assumptions and conceptual commitments.” Margaret Jane Radin, *Of Priors and Of Disconnects*, 127 HARV. L. REV. F. 259, 260 (2014). Unless otherwise noted, the term “priors” is being used in this Article in the latter—more general—sense.

134. *See* Golden, *supra* note 37, at 330 (“It is well known that how a person . . . understands a legal document can depend strongly on that person's mental framework and background knowledge.” (footnote omitted)).

135. Richard C. Anderson, *Role of the Reader's Schema in Comprehension, Learning, and Memory*, in *THEORETICAL MODELS AND PROCESSES OF READING* 476, 476–79 (Donna E. Alvermann et al. eds., 6th ed. 2013).

136. *Id.* at 476–77 (providing similar example).

137. *Id.*

138. *See id.*

1. Technical Background

Readers with technical expertise relating to a particular technology may have developed various schemas relating to that subject. And like the people who understand the “Number 37” sentence in the context of baseball, technically knowledgeable readers may unconsciously read into the claims extra details or assumptions furnished by their schemas, which may not be apparent to someone who lacks the requisite technical expertise. As such, it is possible that someone with technical expertise may be prone to interpreting certain claims more narrowly than someone without such knowledge.

For example, the proliferation of functional claims in issued patents, especially those relating to software,¹³⁹ suggests that examiners do not notice defects in the disclosure requirement¹⁴⁰ as often as they should. The prevalence of this failure suggests that there may be an unconscious aspect to it, whereby an examiner’s technical priors may be routinely filling in the gaps in a vague or overbroad claim, such that he fails to recognize potential indefiniteness, written description, or enablement issues. A claim written in thinly veiled functional language intended to avoid the application of 35 U.S.C. § 112(f) that is accompanied by a bare-bones disclosure may look overly broad and inchoate, especially to someone who is not steeped in the context of the invention or the relevant technical field. However, this same claim and disclosure may look more substantive and “fleshed out” to an examiner who is viewing it through the lens formed by synthesizing the *ex parte* arguments provided by the patent attorney regarding the invention, the examiner’s own familiarity with the technical field through his education, and the sheer quantity of prior art to which he has been exposed as part of his daily work activities. In essence, where others might see only a random assortment of dots, the examiner may discern a clear shape, in which the dots conform to some pattern in a context to which the examiner has been routinely exposed or immersed. And because patent examination is *ex parte*, there is no opposing party who could provide debiasing information that might challenge the examiner’s perception that a claim is clearer than it actually is. Consequently, where extra features have been un-

139. See generally Mark A. Lemley, Address, *Software Patents and the Return of Functional Claiming*, 2013 WIS. L. REV. 905 [hereinafter Lemley, *Functional Claiming*] (discussing the issues associated with broad functional claims).

140. 35 U.S.C. § 112 (2012).

consciously read in by the “expert” examiner in the course of examination—thereby making the claims appear narrower and/or adequately supported—the resulting claim (as issued) might be viewed as overly broad when later construed by others who do not share the examiner’s priors.

2. Legal Background

Those who are familiar with the best practices and the linguistic mannerisms of patent attorneys in claiming inventions are likely to interpret claims differently from those do not possess this specialized knowledge.¹⁴¹ For example, what an inventor and his patent attorney see when reading the same claim is likely to be different: the inventor, who is usually a layperson, might discern only a specific embodiment without appreciating the fact that the claim might have been written at a more abstract level to encompass additional embodiments and potential variations.¹⁴² Indeed, it is not uncommon for an inventor to have difficulty figuring out what the claims cover in his own patent.¹⁴³

More generally, a reader who has legal training—and for whom exegesis is a fundamental, acquired skill—may be more inclined to parse claim language than a lay reader.¹⁴⁴ Lawyers are trained to closely evaluate the meaning of individual words and are acquainted with the basic rules of statutory construction and contract interpretation. They are also socialized to look for

141. See Golden, *supra* note 37, at 336–40 (describing specialized, legalistic nature of claim construction).

142. See George F. Wheeler, *Creative Claim Drafting: Claim Drafting Strategies, Specification Preparation, and Prosecution Tactics*, 3 J. MARSHALL REV. INTEL. PROP. L. 34, 53 (2003) (“[T]ake pains to write the broadest available claims. Write many independent claims, each ideally having a different, single distinction over the closest prior art. Do not stop until you have the broadest available claims of all available types.”); Donald A. Streck, *Choosing the Right Patent Attorney for Today’s Technology*, INTEL. PROP. TODAY, Mar. 1996, at 24, 24 (“[T]he patent attorney’s challenge is to ‘help’ the inventor think of the alternate embodiments and improvements on their own. This can sometimes be very frustrating when you can see three other embodiments and the client inventor insists that there are no more.”).

143. See, e.g., *When Patents Attack*, NPR: PLANET MONEY (July 22, 2011), <http://www.npr.org/sections/money/2011/07/26/138576167/when-patents-attack> (reporting remarks from a computer programmer who says his own software patents are “mumbo jumbo that nobody understands and makes no sense from an engineering standpoint whatsoever”).

144. In deciding that claim construction should be a question of law, the Supreme Court pointed to the jury’s lack of training in exegesis. *Markman v. Westview Instruments, Inc.* 517 U.S. 370, 388 (1996) (noting that the “construction of written instruments is one of those things that judges often do and are likely to do better than” those who are “unburdened by training in exegesis”).

errors in a body of text.¹⁴⁵ As such, an individual with legal training may be unconsciously prone to engaging in some form of parsing when reading a claim. The extent and quality of the parsing may be a further variable as it could depend on an individual's specific training and experience in patent law, along with situational considerations, such as workload and time constraints.¹⁴⁶

In contrast, for a lay reader, parsing may not typically inform the unconscious processes that influence claim interpretation, such that the description of the preferred embodiments in the specification is likely to serve as the primary—if not exclusive—point of reference when ascertaining claim scope. For readers who engage in minimal parsing or none at all, it is possible that a claim may simply act as a skeleton on which the disclosed embodiments are draped.

3. Personal Attitudes

A reader's priors may give rise to personal attitudes, preferences, and opinions (e.g., toward the subject matter, the parties, the circumstances) that may influence how the reader construes a claim. And where likes and dislikes are involved, System 2 can act as “an apologist for the emotions of System 1,” rather than as a moderator, and seek information and arguments in support thereof.¹⁴⁷ This can give rise to “motivated reasoning,” whereby people reason their way to a preferred conclusion, “with their preferences influencing the way evidence is gathered, arguments are processed, and memories of past experience are recalled.”¹⁴⁸

As Judge Alex Kozinski has acknowledged, judges have “biases, interests, leanings, [and] instincts,” and they need to fight the impulse to “take sides in a case and subtly shade the decision-making process.”¹⁴⁹ A notable illustration of the impact of personal attitudes is provided in a study that reveals how the

145. See, e.g., Jeff Lipshaw, *A Lawyer Reads an Ad . . . Or Are Parsers People?*, PRAWFSBLAWG (Sept. 21, 2016), <http://prawfsblawg.blogs.com/prawfsblawg/2016/09/a-lawyer-reads-an-ad-or-are-parsers-people-1.html>.

146. See *infra* Part II.C.

147. KAHNEMAN, *supra* note 91, at 103–04.

148. Nicholas Epley & Thomas Gilovich, *The Mechanics of Motivated Reasoning*, 30 J. ECON. PERSP. 133, 133 (2016); see also Ziva Kunda, *The Case for Motivated Reasoning*, 108 PSYCHOL. BULL. 480, 480 (1990) (observing that “motivation may affect reasoning through reliance on a biased set of cognitive processes”).

149. Alex Kozinski, *What I Ate for Breakfast and Other Mysteries of Judicial Decision Making*, 26 LOY. L.A. L. REV. 993, 997 (1993).

Federal Circuit judges' level of familiarity (or affinity) with the district judge whose claim construction is under review may influence whether the district court's claim construction is affirmed.¹⁵⁰ Specifically, Mark Lemley and Shawn Miller found that for district judges who sat by designation at the Federal Circuit, their reversal rates on subsequent claim construction appeals decreased by fifty percent,¹⁵¹ and that this result was unlikely to be attributable to learning effects.¹⁵²

Personal attitudes may also be shaped by a reader's experiences. A study by Mark Lemley, Su Li, and Jennifer Urban reveals that district judges who are highly experienced with patent cases tend to rule against the patentee on infringement issues by a statistically significant margin compared to judges with less patent case experience.¹⁵³ Based on these results, Lemley and his coauthors surmise that judges who are experienced with patent cases may be more skeptical of patentees' arguments that they are entitled to broad claims.¹⁵⁴ Surprisingly, this result also largely holds for the district judges of the Eastern District of Texas,¹⁵⁵ despite their alleged "forum selling" behavior in which they try to attract patent cases to their district by adopting procedures favorable to patentees.¹⁵⁶

Claim interpretation may also be affected by the individual philosophies and attitudes of a judge¹⁵⁷ on topics such as: the

150. See Mark A. Lemley & Shawn P. Miller, *If You Can't Beat 'Em, Join 'Em? How Sitting by Designation Affects Judicial Behavior*, 94 TEX. L. REV. 451 (2016).

151. *Id.* at 451.

152. *Id.* at 473 ("Both judges who heard claim construction cases on appeal and those who didn't benefitted from the after-designation effect in their subsequent claim construction appeals. . . . This suggests that neither substantive learning about claim construction nor even learning what Federal Circuit judges like to read in a claim construction opinion are at work . . .").

153. Mark A. Lemley et al., *Does Familiarity Breed Contempt Among Judges Deciding Patent Cases?*, 66 STAN L. REV. 1121, 1121, 1140–44 (2014).

154. *Id.* at 1151–52.

155. *Id.* at 1154.

156. Daniel Klerman & Greg Reilly, *Forum Selling*, 89 S. CAL. L. REV. 241, 241 (2016); see also J. Jonas Anderson, *Court Competition for Patent Cases*, 163 U. PA. L. REV. 631, 635–36 (2015).

157. See Thomas W. Krause & Heather F. Auyang, *What Close Cases and Reversals Reveal About Claim Construction at the Federal Circuit*, 12 J. MARSHALL REV. INTELL. PROP. L. 583, 584–85 (2013) (noting that in close cases, preferences or tendencies of Federal Circuit judges may be revealed).

proper role of the specification in claim construction (proceduralist vs. holistic);¹⁵⁸ the degree of deference to be accorded to trial courts;¹⁵⁹ and the extent to which patent rights are properly balanced in relation to the public interest.¹⁶⁰ For example, widespread complaints and negative public opinion about patent assertion entities, particularly in the high-technology industries, may be affecting the Federal Circuit's assessment of the proper claim scope in certain cases¹⁶¹: according to a study by Christopher Cotropia that looked at cases from 2010 to 2013, claim constructions that resulted in patentee wins at the district court level were disproportionately likely to be overturned on appeal if the patent related to electronics, information technology, or business methods.¹⁶²

It is possible that the impact of individual judicial philosophies and preferences on claim scope might be more pronounced at the Federal Circuit than either at the PTO or at the district court level because the readers in those subordinate tribunals operate under a greater likelihood of having their constructions reviewed by a superior tribunal and potentially overruled, as claim construction is a question of law that is reviewed *de novo*.¹⁶³ In contrast, for Federal Circuit judges, the likelihood of review by a superior tribunal (i.e., the U.S. Supreme Court) is relatively low,¹⁶⁴ such that they may feel less constrained in having their preferences and attitudes reflected in their decisions.

C. SITUATIONAL CONSIDERATIONS

A reader's interpretation of a claim may also be affected by his environment. This is termed "situationism," which is a "strain of social psychology that suggests that human behavior is commonly the product of the situations in which people find

158. Wagner & Petherbridge, *Federal Circuit Succeeding*, *supra* note 45; see also Krause & Auyang, *supra* note 157, at 594–95.

159. Krause & Auyang, *supra* note 157, at 596–97.

160. *Cf. id.* at 596 (noting that, for some judges, "pro-patent votes closely correlate to broader claim interpretations").

161. *Cf. Lee Epstein & Andrew D. Martin, Does Public Opinion Influence the Supreme Court? Possibly Yes (But We're Not Sure Why)*, 13 U. PA. J. CONST. L. 263, 265–67 tbl.1 (2010) (summarizing literature on multivariate studies on the effect of public opinion on Supreme Court decisions).

162. Christopher A. Cotropia, *Patent Claim Interpretation Review: Deference or Correction Driven?*, 2014 BYU L. REV. 1095, 1113–17 (2014) [hereinafter Cotropia, *Deference*].

163. See *supra* note 44 and accompanying text.

164. See *infra* note 203.

themselves, more so than their own underlying personalities.”¹⁶⁵ Resource constraints (such as time and money), the consequences of failure, whether the decisionmaker is an individual or a group, and other environmental characteristics, could all potentially impact the analysis of claim language by making the reader more (or less) susceptible to cognitive biases by weakening (or strengthening) the ability of System 2 to monitor System 1’s conclusions,¹⁶⁶ or more (or less) prone to engaging in motivated reasoning to reach a desired outcome.¹⁶⁷ More generally, situational considerations may give rise to “satisficing” (as opposed to “optimizing”) behavior¹⁶⁸ in arriving at a claim construction: a reader may well decide that his or her interpretation of a claim is “good enough” in light of competing priorities.

1. Docket Pressures

Claim interpretation might be influenced by a reader’s workload in a couple of ways. First, the quality of parsing may be affected: a time-pressed reader who manages a heavy docket might be prone to relying on heuristics instead of undertaking the cognitively intensive, deliberative act of parsing. Second, if a certain interpretation is likely to lighten a reader’s workload by either simplifying the analysis or hastening the resolution of a matter, whereas an alternative interpretation would complicate or prolong it, the reader might find the arguments supporting the former more compelling—at an unconscious level—than the arguments supporting the latter.

By way of illustration, docket pressures¹⁶⁹ might prompt examiners to unconsciously favor narrower interpretations. A

165. Jeffrey J. Rachlinski, *The Psychological Foundations of Behavioral Law and Economics*, 2011 U. ILL. L. REV. 1675, 1690 (2011). See generally LEE ROSS & RICHARD E. NISBETT, *THE PERSON AND THE SITUATION* (1991) (synthesizing research on situational determinants of human behavior).

166. See KAHNEMAN, *supra* note 91, at 41–44 (describing the impact of ego depletion on System 2); *id.* at 97–99 (discussing how “a lazy System 2” adopts the answer provided by System 1).

167. See *supra* note 148 and accompanying text.

168. See Herbert A. Simon, *Rational Choice and the Structure of the Environment*, 63 PSYCHOL. REV. 129, 129, 136–37 (1956).

169. See Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1496 n.3 (2001) [hereinafter Lemley, *Rational Ignorance*] (“[T]here are strong structural and psychological pressures on examiners to issue patents rather than reject applications . . .”).

high-volume application-processing operation may leave an examiner little time¹⁷⁰ to fully parse the claims using BRI and consider the full range of possibilities beyond the disclosed embodiments, which is a deliberative process that imposes a high cognitive load.¹⁷¹ Instead, through a combination of heuristics and priors, an examiner's assessment of claim scope is likely to correspond to a stereotypical image of the invention based on the preferred embodiment, as discussed previously.¹⁷² That is, an examiner may be allowing an initial quick—but narrow—answer generated by System 1 to remain unexamined (and uncorrected) by the deliberative processes of System 2. This may cause examiners to perceive claims as narrower than the full scope derived by applying BRI, thereby decreasing the likelihood that a claim would be deemed unpatentable in view of the prior art or a lack of support in the disclosure.¹⁷³ Moreover, a narrow reading of the claim may be unconsciously appealing to an examiner because it would render a claim patentable, thereby advancing the prosecution of the application to its conclusion and disposal.¹⁷⁴ In contrast, a broad interpretation could prolong the proceedings because the likelihood of an unpatentability determination would increase, which may lead to the filing of a Request for Continued Examination, a continuation application, or a PTAB appeal.¹⁷⁵

170. See *id.* (“Examiners have astonishingly little time to spend on each application—on average, a total of eighteen hours . . .”); Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents? Evidence from Microlevel Application Data*, 99 REV. ECON. & STAT. 550 app. tbl.A1 (2017).

171. Several empirical studies suggest that examiners avoid time-consuming work in a manner that impacts patent quality. See Christopher A. Cotropia et al., *Do Applicant Patent Citations Matter?*, 42 RES. POLY 844, 851 (2013) (reporting results suggesting that an examiner is more likely to rely exclusively on his own search results without substantively considering the prior art submissions of the applicant); Frakes & Wasserman, *supra* note 170, at 560 (“Our analysis finds that as examiners are given less time to review applications upon certain types of promotions, the less prior art they cite, the less likely they are to make time-consuming obviousness rejections, and the more likely they are to grant patents.”).

172. See *supra* Parts II.A.2, II.B.1.

173. See *supra* Part II.B.1.

174. See Lemley, *Rational Ignorance*, *supra* note 169 (“[T]he only way for an examiner to guarantee that an application is finally disposed of is to issue a patent. Examiners who want credit for dispositions therefore have a strong incentive to issue patents to persistent applicants, rather than to continue rejecting the applications.”).

175. See Mark A. Lemley & Bhaven Sampat, *Examining Patent Examination*, 2010 STAN. TECH. L. REV. 2, para. 18 (listing the options available to patent applicants for extending prosecution).

Similar considerations may affect the manner in which district judges construe claims, but to a different degree. Like a patent examiner, a district judge manages a heavy docket of cases.¹⁷⁶ However, unlike a patent examiner, a district judge is provided with adversarial briefing, which can ease the cognitive burden of exploring interpretive possibilities under the current claim construction regime that may require claim scope to extend substantially beyond the preferred embodiments. Thus, to the extent that a heavy docket may adversely affect a reader's proclivity to engage in System 2 deliberation, it may have a much stronger impact on an examiner than on a district judge. The primary manner in which a heavy docket, in and of itself, might influence a district judge's claim interpretation could, instead, be in the selection of an interpretation that would substantially streamline the case or hasten its termination.¹⁷⁷ For example, if a narrow interpretation could support a noninfringement ruling that would dispose of multiple claims or even the entire case via summary judgment or settlement,¹⁷⁸ a district judge might find, unconsciously, the arguments in favor of a narrow interpretation more compelling than the arguments in favor of a broad one.

For PTAB judges, it is possible that the impact of docket pressure on claim construction might be the most acute *before* the institution of a postgrant proceeding, such as inter partes review. The PTAB has deadlines set by statute for completing

176. According to one estimate, the average number of new incoming cases per district judge was 388 during a twelve-month period from July 1, 2013 to June 30, 2014. AS WORKLOADS RISE IN FEDERAL COURTS, JUDGE COUNTS REMAIN FLAT, TRANSACTIONAL RECORDS ACCESS CLEARINGHOUSE (Oct. 14, 2014), <http://trac.syr.edu/tracreports/judge/364>.

177. See RICHARD A. POSNER, *THE FEDERAL COURTS: CHALLENGE AND REFORM* 178–79 (1996) (observing that the “pressure of a growing caseload has resulted in streamlining or corner cutting” in the district courts, which “try to dispose of civil cases at earlier stages in the litigation, as by granting summary judgment or a motion to dismiss for failure to state a claim”).

178. See John R. Allison et al., *Understanding the Realities of Modern Patent Litigation*, 92 TEX. L. REV. 1769, 1789–90 (2014) (explaining how it is easier for a court to dispose of a case through a summary judgment ruling in favor of the defendant, rather than one in favor of the patentee). Although a patentee might seek a narrow interpretation to avoid prior art, it is far more likely that the party advocating a narrow construction is the accused infringer who is seeking to prove noninfringement, which, compared to invalidity, is less burdensome for an accused infringer to prove: noninfringement may be proven by showing the absence of a single element by a preponderance, rather than showing that every element is present in the prior art to invalidate a claim by clear and convincing evidence. See *id.*

postgrant proceedings¹⁷⁹ under the America Invents Act (AIA).¹⁸⁰ As such, the PTAB judges may have an interest in keeping the number of proceedings manageable in order to be able to meet those deadlines. Given that the decision whether to institute an AIA proceeding is unappealable,¹⁸¹ denying petitions for review may provide the PTAB judges with an effective mechanism for directly managing their workload.¹⁸² For example, a PTAB panel could avoid instituting an inter partes review (and the resulting follow-on work)¹⁸³ by finding there is no “reasonable likelihood” that the petitioner would prevail as to any of the challenged claims,¹⁸⁴ based on a narrow reading of the claims that avoids invalidity. This possibility—that the PTAB judges may be unconsciously reading the claims narrowly to make it less likely that a claim would be found invalid in order to deny petitions so as to control their workload—might be a factor contributing to the progressive decrease in the institution rate for postgrant proceedings,¹⁸⁵ apart from other reasons such as pre-institution settlements and the quality of petitions.¹⁸⁶ Once an inter partes review has been instituted, it is possible that the *opposite* directional bias might affect the PTAB panel’s claim

179. 35 U.S.C. § 316(a)(11) (2012) (specifying that “the final determination in an inter partes review be issued not later than 1 year after the date on which the Director notices the institution of a review . . . except that the Director may, for good cause shown, extend the 1-year period by not more than 6 months”).

180. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified in scattered sections of 35 U.S.C.).

181. 35 U.S.C. § 314(d) (“The determination by the Director whether to institute an inter partes review under this section shall be final and nonappealable.”).

182. PERKINS COIE, INTER PARTES REVIEW PROCEEDINGS: A FOURTH ANNIVERSARY REPORT 8 (2016), https://issuu.com/perkinscoie/docs/ipr_anniversary_report_4_final [hereinafter PERKINS COIE REPORT] (“One possible explanation for this decrease in institution rate is the overwhelming popularity of IPRs. A lower rate of institution allows the PTAB to control its workload to meet the 18-month statutory deadline for issuance of final written decisions.”).

183. At the PTAB, the same panel of judges who handle the institution decision also preside over the proceeding after institution. See *Ethicon Endo-Surgery, Inc. v. Covidien LP*, 826 F.3d 1366, 1366, 1368 (Fed. Cir. 2016) (Newman, J., dissenting).

184. 35 U.S.C. § 314(a).

185. See Tony Dutra, *Increase in PTAB Petition Denials Shows Shift in Ability to Defend Challenged Patents*, 92 PAT. TRADEMARK & COPYRIGHT J. 860, 860 (2016) (“Data from Bloomberg BNA[] . . . through May 31, 2016, show the board denied inter partes review (IPR) petitions . . . at a rate of about 34 percent in the most recent year, and 29 percent in the preceding year. That compares to about 18 percent in the PTAB’s early days.”).

186. See, e.g., PERKINS COIE REPORT, *supra* note 182, at 8–9.

construction: instead of an unconscious preference for a narrow interpretation (as in the preinstitution stage), confirmation bias may influence the *post*institution claim interpretation such that the panel might favor a broad interpretation that would support a finding of invalidity—thereby confirming the panel’s decision to institute the proceeding.¹⁸⁷

Unlike the proceedings at the district court or at the PTAB, the directionality of claim interpretation (i.e., broad versus narrow) might not have a substantial or predictable effect on the Federal Circuit’s workload, given that most appeals are, by comparison, relatively compact proceedings involving only a single round of briefing and oral argument followed by a disposition.¹⁸⁸ To the extent that claim construction could meaningfully impact the Federal Circuit’s workload, it may arise from its *disposition*, rather than its directionality; that is, whether the claim construction under review is being affirmed or not. Compared to reversals or modifications of the judgment below, affirmances may require less work because they may borrow the reasoning of the decision under review or, in some cases, may be decided summarily without opinion.¹⁸⁹ It is possible then, that a Federal Circuit panel’s interpretation of a claim could be influenced by the panel members’ desire to alleviate their workload through affirmance: the judges who feel their workload is unusually heavy might find, unconsciously, the arguments in favor of affirmance to be more convincing.¹⁹⁰

However, it is not clear whether a claim construction that has been modified—or is otherwise the product of intense deliberative reasoning by a panel of Federal Circuit judges as set forth in a written opinion—is necessarily more reliable than a construction that has been summarily affirmed without opinion. Ostensibly, the Federal Circuit judges have the lightest docket pressure among the three types of judicial readers discussed thus far, as they do not have heavy individual loads like district

187. See *supra* note 130 and accompanying text.

188. A case may return to the Federal Circuit after an appeal from a remand, see, e.g., *Liebel-Flarsheim Co. v. Medrad, Inc.*, 481 F.3d 1371, 1373–77 (Fed. Cir. 2007), but such cases are infrequent.

189. See FED. CIR. R. 36.

190. See POSNER, *supra* note 177, at 345 (“[O]ne consequence of the heavy caseload pressures on the courts of appeals has been an increase in the deference paid by those courts to the rulings made by district judges.”); see also Bert I. Huang, *Lightened Scrutiny*, 124 HARV. L. REV. 1109, 1114–15 (2011) (reporting results of empirical study showing that the civil appeal reversal rate decreased in appellate courts that experienced a workload surge or multiple judicial vacancies).

judges and are not subject to statutorily set deadlines for dispositions like PTAB judges. This, along with their extensive experience with patent-specific exegesis, might place Federal Circuit judges in the best position to undertake the cognitively intensive, deliberative process to parse a claim in a manner that explores the full range of interpretive options. However, when Federal Circuit judges engage in deliberative reasoning—thereby resisting reliance on the quick, heuristic-generated answers provided by System 1—other behavioral elements, such as their priors,¹⁹¹ may still affect the outcome when they are ratified and rationalized via System 2, as suggested by the phenomenon of panel dependence.¹⁹²

2. Stakes and Consequences

For examiners, taking cognitive shortcuts—which can yield artificially narrow claim scope¹⁹³—is relatively low-cost and low-risk because an error associated with an individual patent (let alone an individual claim) is unlikely to materially affect their work or status at the PTO. Given the application backlog, examiners are evaluated primarily on their docket management skills,¹⁹⁴ rather than on the quality of their examination.¹⁹⁵ Because of organizational difficulties associated with reliably enforcing quality control at the PTO,¹⁹⁶ the consequences for allowing defective claims to issue may not be imminent for examiners, and are thus likely to be substantially discounted by them.¹⁹⁷ More generally, the likelihood that an error in claim scope will be discovered is extremely low, given that relatively few issued patents are carefully read, let alone asserted and tested in

191. See *supra* Part II.B.3.

192. See *supra* notes 45–46 and accompanying text.

193. See *supra* Parts II.A.2, II.B.1, II.C.1.

194. See U.S. DEP'T OF COMMERCE, OFFICE OF INSPECTOR GEN., USPTO NEEDS TO STRENGTHEN PATENT QUALITY ASSURANCE PRACTICES 4–9 (Apr. 10, 2015), <https://www.oig.doc.gov/OIGPublications/OIG-15-026-A.pdf>.

195. For example, in fiscal years 2011 through 2013, the PTO issued written warnings on docket-related issues to hundreds of examiners, while issuing written warnings on quality issues to only seven examiners. *Id.* at 8–9.

196. See *id.* at 6–7 (suggesting that supervisors may be reluctant to undertake the time- and labor-intensive process associated with formally charging errors based on quality issues).

197. Cf. Jolls et al., *supra* note 7, at 1539 (“[I]mpatience is very strong for near rewards (and aversion very strong for near punishments) but . . . each of these declines over time—a pattern referred to as ‘hyperbolic discounting.’” (citation omitted)).

court.¹⁹⁸ Accordingly, the stakes may not be high enough for an examiner to undertake the effort to thoroughly parse claim language under BRI.

By comparison, the PTAB judges who preside over postissuance proceedings do not process a high volume of low-stakes patents for which errors are unlikely to be noticed. Rather, most of the patents the PTAB judges handle in those proceedings either have been or have a high likelihood of being litigated,¹⁹⁹ such that a substantial likelihood of appeal exists.²⁰⁰ Concerns about reversal aversion²⁰¹ may thus prompt PTAB judges to commit more cognitive resources than an examiner to closely parsing claim language to ascertain the full extent of what would be deemed the “broadest reasonable construction” of a claim.

Similarly, litigation counsel, district judges, and Federal Circuit judges may undertake more effortful parsing than examiners because their constructions are subject to close scrutiny by clients, other tribunals, and the public. These readers operate in high-stakes, adversarial proceedings in which their reputations may be affected by their performance—to varying degrees. For example, district judges, according to Jeffrey Lefstin, may be more “personally accountable for their judgments” than Federal Circuit judges, as the former directly bear the impact of their

198. For example, in 2014, the PTO issued 300,677 utility patents. *U.S. Patent Statistics Chart Calendar Years 1963–2015*, U.S. PATENT & TRADEMARK OFFICE, https://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm (last updated June 15, 2016). That year, according to an estimate by the PTO’s Office of Chief Economist, there were over 2.5 million utility patents in force. Alan C. Marco et al., *The USPTO Historical Patent Data Files: Two Centuries of Innovation* 17, 32 fig.6 (U.S. Patent & Trademark Office, Working Paper No. 2015-1, 2015), <http://ssrn.com/abstract=2616724>. Of these, 4922 utility patents (i.e., 0.2% of all utility patents in force at the time) were asserted in patent suits filed in U.S. district courts in 2014, according to a June 27, 2017 search on DOCKET NAVIGATOR, <https://www.docketnavigator.com>.

199. See HARNES DICKY, *A Look at Fifty-One Months of Inter Partes Review Proceedings Before the United States Patent and Trademark Office*, in 16 HARNESING PATENT OFFICE LITIGATION 1 (2017), <http://ipr-pgr.com/wp-content/uploads/2017/03/IPR-PGR-Report-Vol.-16.pdf> (reporting that from September 16, 2012, to December 16, 2016, seventy-nine percent of inter partes review proceedings involved patents litigated concurrently in district court).

200. See Vin Gurrieri, *Fed. Circ. Can Handle Crush of PTAB Appeals*, LAW360 (Mar. 8, 2016), <https://www.law360.com/articles/767352>.

201. See Joanna Shepherd, *Measuring Maximizing Judges: Empirical Legal Studies, Public Choice Theory, and Judicial Behavior*, 2011 U. ILL. L. REV. 1753, 1759 (2011) (“[A]lthough the empirical evidence is somewhat mixed, the majority of recent studies find that self-interest concerns, such as promotion desires and reversal aversion, influence the decisionmaking of judges with permanent tenure.”).

decisions on case-management issues and cannot hide behind a panel.²⁰² Compared to district judges and PTAB judges, Federal Circuit judges are highly unlikely to have their claim constructions reviewed by a superior tribunal (which, for the Federal Circuit, is the U.S. Supreme Court),²⁰³ such that reversal aversion may be less of a concern than their self-image,²⁰⁴ their legacy,²⁰⁵ and the bar's opinion of them.²⁰⁶ This might allow the personal attitudes of each panel member,²⁰⁷ as well as the interpersonal dynamics within the panel,²⁰⁸ to play a larger role in influencing the construction, as evidenced by, for example, the doctrinal schism between the proceduralists and the holistics, and the resulting panel dependence in claim construction dispositions.²⁰⁹

While raising the stakes (or enhancing the severity of the consequences for being incorrect) may prompt readers to engage in more effortful, deliberative attempts at claim construction, they may not always yield a construction that is more consistent among different readers or more accurate (however defined), as some readers may engage in motivated reasoning to suit their agendas or circumstances. In addition, some behavioral phenomena, such as anchoring, may be largely unaffected by incentives for accuracy.²¹⁰ In an experiment with a group of administrative law judges, Chris Guthrie, Jeffrey Rachlinski, and Andrew

202. Lefstin, *Interpretive Regimes*, *supra* note 56, at 1057.

203. See *The Justices' Caseload*, SUPREME COURT OF THE UNITED STATES, <http://www.supremecourt.gov/about/justicecaseload.aspx> (last visited Feb. 1, 2018) ("Each Term, approximately 7,000–8,000 new cases are filed in the Supreme Court. . . . Plenary review, with oral arguments by attorneys, is currently granted in about 80 of those cases each Term, and the Court typically disposes of about 100 or more cases without plenary review.").

204. See *supra* note 128 and accompanying text.

205. Cf. Stephen J. Choi et al., *Professionals and Politicians: The Uncertain Empirical Case for an Elected Rather than Appointed Judiciary*, 26 J.L. ECON. & ORG. 290, 290 (2010) (reporting results of empirical study of state high court opinions that suggest "elected judges focus on providing service to the voters, whereas appointed judges care more about their long-term legacy as creators of precedent").

206. Ali Mojibi, *An Empirical Study of the Effect of KSR v. Teleflex on the Federal Circuit's Patent Validity Jurisprudence*, 20 ALBANY L.J. SCI. & TECH. 559, 561 (2010) (observing that empirical study of the law on obviousness suggests that "statistically speaking, the Federal Circuit in particular and judges in general may be surprisingly sensitive to criticism coming from the practicing bar and academia").

207. See *supra* Part II.B.3.

208. See *infra* Part II.C.3.

209. See *supra* notes 45–46 and accompanying text.

210. Tversky & Kahneman, *supra* note 93, at 1128 ("Payoffs for accuracy did not reduce the anchoring effect.").

Wistrich found that the presence or absence of accountability in their damage awards had no appreciable impact on the power of anchoring.²¹¹

3. Group Deliberation

Group deliberation may have the effect, in some cases, of debiasing or mitigating the effects of cognitive biases. The impact of the heuristics and priors discussed in previous Sections may be the most salient when viewed with respect to the decisions of one individual. The decision of a group, by contrast, might reflect a melding of interpretations or the selection of a consensus choice among multiple options, as the author of an opinion has to make a conscious effort to win over at least one other judge on a three-judge panel. This may mute the influence of certain individual personal characteristics: according to an empirical study by Kimberly Moore, an individual Federal Circuit judge's technical background, prior patent-related experience, or political affiliation (as measured by the party of the appointing president) has no statistically significant relationship with the likelihood that a claim construction decision would be affirmed or reversed.²¹²

In considering the effects of group deliberation, it might be helpful to compare PTAB judges with examiners. PTAB judges reach decisions as a panel with three members. Compared to the work of an individual patent examiner, the act of collective deliberation by a PTAB panel may help mitigate the influence of each member's individual priors, as well as distribute the cognitive load of parsing text. As such, when the authoring judge of a PTAB opinion interprets a claim under BRI, he or she may be less likely than an examiner to adopt the "easy" answer suggested by his or her cognitive biases by virtue of the fact that a single judge cannot make a decision alone, and must convince at least one other judge through arguments that require deliberative reasoning under System 2. Because the PTAB judges are more likely to engage in a deliberative analysis of claim scope under BRI, their assessment of scope is likely to be broader—thereby rendering the claim more susceptible to invalidation—than that of an examiner. In this manner, the relative influence of a single individual's cognitive biases on claim interpretation

211. Chris Guthrie et al., *The "Hidden Judiciary": An Empirical Examination of Executive Branch Justice*, 58 DUKE L.J. 1477, 1503–06 (2009).

212. Moore, *supra* note 40, at 26–27.

is likely to be attenuated in a PTAB panel decision when compared to an office action prepared by an individual examiner.

Although group deliberation might mitigate some behavioral elements, it may amplify others. For example, when particular attitudes are shared by several members of a group, it may be reinforced. A study by Cass Sunstein, David Schkade, and Lisa Michelle Ellman reveals that group deliberation can result in more extreme results through an amplification effect based on panel composition: panels staffed by appointees of a single political party were found to rule in ways that were more extreme than if the panel composition were mixed.²¹³ Group deliberation also introduces group dynamics, whereby the group's desire to maintain collegiality and each individual's desire to minimize work may influence the ultimate construction adopted.²¹⁴ Indeed, a judge who is sitting with other judges on a panel may go along with a suboptimal construction because it entails less work than dissenting or attempting to change the authoring judge's mind.²¹⁵

At the Federal Circuit, panel dependence on claim construction issues is a well-known phenomenon that reflects the existence of two distinct camps of judges: the proceduralists and the holistics.²¹⁶ Although the individual backgrounds of Federal Circuit judges may not appreciably affect how they may construe claims during group deliberations,²¹⁷ it appears as if the extent to which the judges on a panel share case-related judicial philosophies, attitudes, and preferences²¹⁸ may influence the outcome. Like the Federal Circuit judges, the PTAB judges who deliberate as a panel may also experience similar group-specific behavioral artifacts that may affect their claim interpretations. However, the extent to which such artifacts may create panel dependence at the PTAB might be tempered by the comparatively higher likelihood of review by a superior tribunal.²¹⁹

213. Cass R. Sunstein et al., *Ideological Voting on Federal Courts of Appeals: A Preliminary Investigation*, 90 VA. L. REV. 301, 304–05 (2004).

214. Cf. Bock, *Restructuring*, *supra* note 128, at 222–25 (discussing how collegiality concerns may influence judicial behavior).

215. Cf. Richard A. Posner, *What Do Judges and Justices Maximize? (The Same Thing Everybody Else Does)*, 3 SUP. CT. ECON. REV. 1, 20–21 (1993) (discussing “going along” voting and “live and let live” opinion joining).

216. See *supra* notes 45–46 and accompanying text.

217. Moore, *supra* note 40, at 26–27.

218. See *supra* Part II.B.3.

219. See *supra* note 203 and accompanying text.

In short, to the extent that debiasing can occur in panels of judges, it is imperfect and somewhat unreliable. In addition, the final result may still be highly variable because the parsing is performed not by one person but rather by three who, in the aggregate, can conceive of a greater number of possible interpretations—from which the selection of the group’s preferred interpretation may be influenced by not only the behavioral elements of each individual panel member, but also group-specific behavioral artifacts.

D. READER COMPARISON

For each type of reader, it is likely that a *combination* of behavioral elements may affect how she interprets a claim. The influence of one behavioral element may not necessarily point in the same direction as another with respect to claim scope: some behavioral elements may push the reader toward a narrow interpretation, while others may push for a broader one. For example, a patent litigation attorney with an extensive technical background who is representing the patentee may endeavor to read the claims as broadly as possible and may unconsciously discount strong arguments to the contrary. But, at the same time, she may have a tendency to unconsciously fill in extra technical details (based on her technical priors) when reading the claim, thereby leading her to formulate an interpretation that is somewhat narrower than that reached by a colleague on her team who has no technical background. In addition, the likelihood that a reader may adopt the heuristic-generated answer of System 1 without further modification by the deliberative processes of System 2, or find certain arguments unconsciously compelling, may depend not only on his priors but also on the circumstances (i.e., the situational characteristics) under which he or she is reading the claim.

Table 1 lists several different categories of readers and compares them across several major personal and situational characteristics that may affect their behavioral elements, which, in turn, may influence how they construe claims. In addition to the specific readers listed, there are countless other readers who may be anyone—from a lay member of the public to a former PTO commissioner who serves as a mediator for patent suits.

The list of characteristics in Table 1 is not exhaustive. A comparison of multiple readers who are operating under the same claim construction rules reveals that no two reader types

share the same characteristics. For example, the *Phillips* methodology is applied by litigators, district judges, and Federal Circuit judges—all of whom have different combinations of characteristics that may influence how their behavioral elements may affect their view of claim scope. The same observation may be made for the readers who apply BRI (i.e., patent attorneys, examiners, litigators in PTO proceedings, PTAB judges, and Federal Circuit judges in PTO appeals). Further heterogeneity may exist within each reader type, where variance in the skill levels of individuals may affect the extent and quality of their parsing.

Table 1: Comparison of Reader Characteristics

	Inventor	Pat. Att'y	PTO Exam'r	Litigator	DCT Judge	PTAB Judge	CAFC Judge
Rules of Claim Interpretation	N/A	BRI	BRI	<i>Phillips</i> / BRI	<i>Phillips</i>	BRI	<i>Phillips</i> / BRI
Knowledge re: Invention & Inventor Intent	Highest	High	Low	Medium	Low	Low	Very Low
Technical Background	Yes	Yes	Yes	Varies	Unlikely	Yes	Varies
Legal Background	Unlikely	Varies	Varies	Yes	Yes	Yes	Yes
Represent a Side	Yes	Yes	No	Yes	No	No	No
Adversarial Proceeding	N/A	No	No	Yes	Yes	Yes	Yes
High-Volume Docket for Individual	N/A	Yes	Yes	No	Yes	No	No
Group Deliberation	N/A	N/A	No	N/A	No	Yes	Yes
Overruled on Appeal	N/A	N/A	Possible	N/A	Possible	Possible	Highly Unlikely

III. (DE)BIASING CLAIM CONSTRUCTION

A. THE NEED FOR A NEW CLAIM CONSTRUCTION REGIME

A reader's cognitive biases and priors, along with situational considerations, may not necessarily yield a biased claim interpretation, unless the interpretation regime is susceptible to allowing them to affect the outcome. The current claim construction canons allow a considerable degree of interpretive leeway and discretion, which makes it difficult to guard against the impact of behavioral influences. At one extreme, if the claim interpretation process were limited to applying a simple bright-line rule that disallows the exercise of discretion, then the influence of behavioral elements on interpretation may be rendered negligible. However, the *Phillips* methodology and BRI may be closer to the other extreme, as both require parsing claim language through a cognitively intensive exercise of judgment in the selection and application of interpretive standards and sources to draw clear boundaries in an abstract, open-ended universe. For example, figuring out the "plain and ordinary" meaning of a claim term while striking the correct balance between reading it in light of, but not reading in limitations from, the specification, is a difficult line-drawing problem that yields a wide range of plausible answers that may have been molded by behavioral artifacts. The combination of loose standards,²²⁰ behavioral elements, and different readers may yield considerable reader variance in scope determinations.

The wide variation in scope that is achievable under the *Phillips*/BRI regime makes error correction difficult. So long as a construction appears justifiable or plausible under the *Phillips* methodology or BRI, a reader's deliberative System 2 process may not be able to reliably determine when a cognitive-bias-inflected answer provided by the unconscious process of System 1 requires modification or correction. Moreover, the interpretive flexibility provided by the *Phillips*/BRI regime may allow one reader's idiosyncratic construction, reached through motivated reasoning, to be plausibly rationalized to others. For example, if an examiner has unconsciously imported limitations from the preferred embodiment into his analysis of claim scope, he might be able to later explain it away as an instance of reading the claim in light of the specification. Likewise, an overly broad interpretation of a claim that is completely unmoored from what

220. Or "loose canons."

was invented might be justified by the patentee's litigation counsel as the "plain and ordinary" meaning that does not impermissibly read in limitations from the specification. Similarly, a Federal Circuit panel's decision to affirm a district judge's unduly narrow claim construction may have been strongly influenced by their affinity for the district judge and the desire to alleviate their workload, but may be plausibly rationalized in a short opinion that adopts the district judge's reasoning emphasizing the canon that says claims should be read in light of the specification.

An improved rule of interpretation that might be more resistant to behavioral influences would be one that requires minimal parsing, so as to minimize the exercise of discretion and alleviate the reader's cognitive load. As discussed previously, for some readers, parsing comes naturally or is essential to their purpose for reading a patent.²²¹ However, determining whether their parsing is "correct" (however defined) is difficult to ascertain reliably, as illustrated by the panel-dependent nature of the Federal Circuit's claim construction decisions.²²² Other readers may dispense with parsing either because they are untrained in it, do not have time for it, or find it unnecessary because knowing the gist of the invention is adequate for their purposes. Of these two groups—the parsers and the nonparsers—it is likely that the vast majority of the potential readers of a patent fall into the latter category, as the former is essentially limited to attorneys and judges who are familiar with the *Phillips* methodology and/or BRI and who, unlike the patent examiners, work under circumstances where meaningful attempts at parsing cannot be avoided. This group of parsers is far outnumbered by the nonparsing engineers, scientists, business people, investors, and anyone else located worldwide who might be interested in reviewing a U.S. patent to see if some technology of interest is subject to exclusive rights. Indeed, with the increasing globalization of manufacturing and research and development (R&D), the share of nonparsing foreign readers in the audience for U.S. patents will only grow. (In fact, over fifty percent of the patents granted in the United States over the past several years were of foreign

221. See *supra* Parts II.B.2., II.C.2.

222. See *supra* notes 45–46 and accompanying text.

origin.²²³) In addition, the readers who are responsible for approving the claims that issue—the patent examiners—likely fall into the nonparsing category as a matter of necessity, given their workload.²²⁴

With respect to the sources of interpretation, they should be normalized or limited in order to mitigate the impact of behavioral elements in their selection and use. As discussed previously, readers with differing degrees of expertise in a field may read in or discern additional limitations beyond the claim language (to varying degrees) so as to find patterns, fill in gaps, and organize abstract information into something meaningful.²²⁵ Also, differences in information sets, when combined with cognitive biases, may contribute to different readers assigning different weights to different sources.²²⁶ In such circumstances, reader dependence may be mitigated by normalizing the amount of technical information that may be read in and dramatically increasing the salience of a single interpretive source. One way of doing this would be to rely heavily on the specification, which is a source of information available to all readers of a patent claim.

B. PROPOSAL: MEANS-PLUS-FUNCTION ANALYSIS FOR ALL CLAIMS

At the present time, one circumstance under which the interpretive rule involves limited or minimal parsing, and where the interpretive source is normalized to the specification, is in the construction of mean-plus-function claim terms under 35 U.S.C. § 112(f).²²⁷ One option, then, for mitigating the influence of behavioral elements in claim construction would be to interpret *all* claim terms via means-plus-function analysis.

Currently, means-plus-function analysis is applied only to means-plus-function claim terms, which either take the form of

223. *U.S. Patent Statistics Chart Calendar Years 1963–2015*, U.S. PATENT & TRADEMARK OFFICE, https://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm (last updated June 15, 2016).

224. *See supra* Part II.C.1.

225. *See supra* Part II.B.1.

226. *See supra* Part II.A.1.

227. 35 U.S.C. § 112(f) (2012) provides that:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

the word “means” followed by the recitation of a function (e.g., “means for fastening”) or simply recite a function and nonce words that fail to connote a sufficiently definite structure for performing that function (e.g., “control module”).²²⁸ According to Federal Circuit case law applying § 112(f), a means-plus-function claim term is “construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.”²²⁹ If the “corresponding structure, material, or acts” in support of the claimed function are not described in the specification, then the means-plus-function claim term—and hence the entire claim—fails to satisfy the definiteness requirement.²³⁰ The determination of the corresponding structure, material, or acts is deemed a matter of claim construction,²³¹ and the sufficiency of the disclosure is ascertained from the point of view of a PHOSITA.²³² Equivalent structures, materials, or acts must have been in existence at the time of patent issuance.²³³

228. See *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349–51 (Fed. Cir. 2015).

229. 35 U.S.C. § 112(f). Under current Federal Circuit case law, the analysis required by § 112(f), including determinations of equivalence, is applied to individual means-plus-function claim terms, rather than to the entire claim in which that term appears. See *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1321–22 (Fed. Cir. 1999) (analyzing two different means-plus-function limitations in single claim); *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 531 (Fed. Cir. 1996) (“We decide on an element-by-element basis . . . whether § 112, ¶ 6 applies.”). John Duffy has observed that § 112(f) has a textual wrinkle whereby means-plus-function analysis might actually apply to the entire *claim*, rather than to just the means-plus-function term, Duffy, *supra* note 48, at 1209–10, whereby the equivalence analysis would serve to limit—not expand—claim scope to those devices that meet the claim limitations literally *and* satisfy the triple-identity doctrine of equivalents analysis, *see id.* at 1204–06.

230. *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (“[I]f one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. [Otherwise,] the applicant has . . . failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.”).

231. *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1379 (Fed. Cir. 1999) (citing *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1308 (Fed. Cir. 1998)).

232. *Id.*

233. *Al-Site Corp.*, 174 F.3d at 1320 (“[A] structural equivalent under § 112 must have been available at the time of the issuance of the claim. An equivalent structure or act under § 112 cannot embrace technology developed after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance.” (citation omitted)). The doctrine of equivalents may be used to extend coverage of a means-plus-function limitation over after-arising technologies. See *id.* at 1320–21; PETER S. MENELL ET AL., PATENT CASE MANAGEMENT JUDICIAL GUIDE 14-86 to 14-87 (3d ed. 2016).

In order to apply means-plus-function analysis to all claim terms, the non-“means” limitations could be treated as references to corresponding items in the specification and their equivalents,²³⁴ given that “a means-plus-function limitation is essentially a generic reference for the corresponding structure disclosed in the specification.”²³⁵ As such, the analysis in the proposed all-means-plus-function claiming regime could resemble the current mode of analyzing claims that have every limitation cast in means-plus-function form, such as Claim 37 of U.S. Patent No. 6,947,903.²³⁶

An all-means-plus-function regime may substantially decrease, but not completely eliminate, the need for parsing, as there will be some incidental parsing involved in mapping the claim language to the content of the specification. However, the primary focus will no longer be on the claim language, but rather on the invention itself and the technical content of the disclosure. The amount of parsing involved in means-plus-function analysis is likely to impose a lower cognitive load—which may help mitigate the influence of behavioral elements arising from workload pressures²³⁷—than either the *Phillips* methodology or BRI, both

234. There might be alternative ways to adapt means-plus-function analysis to all claim types. For example, instead of the current limitation-by-limitation analysis, an entire claim might be mapped holistically to a particular embodiment and its equivalents. However, a detailed comparison of the various options for the universal application of means-plus-function analysis is beyond the scope of this Article and is left to future research. This is because the analysis in this Article relies on the general characteristics of means-plus-function analysis—namely, limited parsing of claim language, tying claim scope to the disclosed embodiments and equivalents thereof, and evaluating claim definiteness based on the content of the disclosure—which would exist in both a limitation-by-limitation analysis as well as a holistic mapping.

235. *Chiuminatta*, 145 F.3d at 1308.

236. Every one of the nine clauses in Claim 37 of U.S. Patent No. 6,947,903 is cast in means-plus-function form:

37. A system for monitoring supply chain activity comprising a plurality of supply chain sites, comprising:
 means for monitoring changed supply-related data . . . ;
 means for extracting . . . ;
 means for translating . . . ;
 means for uploading and collecting . . . ;
 means for formatting . . . ;
 means for publishing . . . ;
 means for monitoring . . . inbound data . . . ;
 means for detecting a problem condition . . . ; and
 means for responding to the problem

U.S. Patent No. 6,947,903 (filed Apr. 7, 2000).

237. See *supra* Part II.C.1.

of which require a reader to articulate the abstract limits of the “plain meaning” of a claim term while balancing conflicting canons on the use of the specification as an interpretive source. In contrast to formulating the abstract boundaries of a claim term, it may be easier to determine whether that claim term has some corresponding example in the specification and to ascertain whether something is a variation on that example (i.e., an equivalent), as it involves a relatively defined, narrow universe of possibilities.

In addition, the specification-correspondence requirement in evaluating definiteness and infringement under means-plus-function analysis may help override the effect of some behavioral elements that could have otherwise led a reader to weigh heavily some random interpretive source. Dramatically increasing the salience of the specification could thus mitigate the effect of differences in information sets among different readers.²³⁸ Moreover, having the specification serve as the most salient interpretive source is appropriate because everyone who reads the claims has access to it, regardless of their circumstances or background knowledge.

In devising an interpretive scheme that would be resistant to behavioral elements, it may be tempting to rely on bright-line rules. But a line that is too bright is problematic because it would reduce the scope of a claim to the exact embodiment disclosed in the specification, which substantially decreases the utility of a patent by allowing infringement through trivial variations. However, the current claim construction regime (consisting of the *Phillips* methodology and BRI) eschews line-drawing to such an extent that it yields results that are highly susceptible to influence by behavioral elements. While the debate over claim construction methodologies could be viewed as a “rules vs. standards”²³⁹ issue, perhaps what is really needed is a hybrid: a rule supplemented with a standard, whereby the rule sets a relatively concrete baseline and the standard provides limited room to deviate from that baseline. The rule portion would serve to cabin the influence of behavioral elements, while the standards portion would allow for flexibility in setting claim scope beyond the literal disclosure using the rule as a reference point. We currently have such a hybrid rule in means-plus-function analysis:

238. See *supra* Part II.A.1.

239. See, e.g., Daniel A. Crane, *Rules Versus Standards in Antitrust Adjudication*, 64 WASH. & LEE L. REV. 49, 52–54 n.11 (2007) (cataloging extensive literature on the “rules versus standards” debate).

the “rule” is that the claim term must have corresponding structures disclosed in the specification, while the “standard” is the claim coverage over equivalents.

Notably, by extending means-plus-function analysis to all claim terms, we would be taking a step toward central claiming²⁴⁰ and focusing more closely on what the inventor has actually invented. Existing commentary suggests that this would be a salutary development as central claiming may comport better with the unconscious mind than peripheral claiming.²⁴¹ One of the features of central claiming that makes it less cognitively burdensome is that it appears to work with (rather than against) the representativeness heuristic and our tendency to stereotype²⁴² by evaluating claim scope chiefly in terms of the disclosed embodiments.²⁴³ As discussed previously, the claim scope envisioned by a reader who has engaged in little to no parsing is likely to track the embodiments in the specification.²⁴⁴

While it is not possible to eliminate cognitive biases, the proposed solution happens to work *with* some of them to limit their ability to aggravate reader-to-reader variance in the ultimate construction reached. As discussed previously, readers who are time-pressed or resource-constrained, such as examiners, may be susceptible to dispensing with parsing and might rely instead on the heuristic-generated answer that equates claim scope with the disclosed embodiments because it is less cognitively intensive to do so.²⁴⁵ Likewise, readers who are incapable of parsing are likely to come up with similar heuristic-generated answers that largely track the embodiments.²⁴⁶ Conveniently, this heuristic-generated answer—what I call the “cognitive default”—

240. Burk & Lemley, *Fence Posts*, *supra* note 2, at 1774 (“The legacy of central claiming also lives on in the practice of means-plus-function claiming.”); Fromer, *supra* note 49, at 738–39; *see also* Mark D. Janis, *Who’s Afraid of Functional Claims? Reforming the Patent Law’s § 112, ¶ 6 Jurisprudence*, 15 SANTA CLARA COMPUTER & HIGH TECH. L.J. 231, 291 (1999) (“[A] careful historical synthesis demonstrates that the disclosure-plus-equivalents scheme of § 112, ¶ 6 has links to the doctrine of equivalents as it was understood in the central claiming regime.” (footnote omitted)). *But see* Duffy, *supra* note 48, at 1204–06 (suggesting that means-plus-function claiming may have descended from a form of peripheral claiming that existed before the formation of the Federal Circuit).

241. *See, e.g.*, Fromer, *supra* note 49, at 763–67 (analyzing central claiming in light of cognitive science literature).

242. *See supra* Part II.A.2.

243. *See, e.g.*, Fromer, *supra* note 49, at 733, 776.

244. *See supra* Part II.B.2.

245. *See supra* Part II.A.2.

246. *See supra* Part II.B.2.

corresponds to a first-order approximation of claim scope under a means-plus-function analysis. Moreover, this “cognitive default” is likely shared by the vast majority of the heterogeneous population of patent readers, where the nonparsers (e.g., engineers, business people, investors) far outnumber the parsers (e.g., patent litigators and federal judges presiding over patent cases).²⁴⁷ By imposing means-plus-function analysis for all claims, there may be less reader variation in assessing claim scope, as it would force nonparsers and parsers alike to moor their interpretation of a claim to the structures, materials, and acts described in the specification that correspond to each claim term—which is what the former is likely to do naturally as a behavioral matter, while cabining the extent of the latter’s behaviorally-influenced parsing by narrowing the universe of plausible constructions. In short, means-plus-function analysis may be more resistant to behavioral influences than the *Phillips*/BRI methodology because it accommodates certain behavioral elements that may systematically yield similar answers for different readers, while, at the same time, limiting the realm of plausibility for answers created through motivated reasoning.

This solution does not seek to eliminate behavioral elements (because it is impossible), and instead attempts to normalize and manage their effects. In contrast, the Federal Circuit has endeavored to eliminate biases in claim construction through its many canons. But as the court itself has realized, some “biasing” is not only unavoidable but also necessary because claim construction—in order to be meaningful—needs to be performed with respect to some concrete frame of reference. A case in point is the Federal Circuit’s rule, set forth en banc shortly after its creation, that district judges should not construe the claims in relation to the accused product.²⁴⁸ This admonition was intended to reduce the risk of biasing the claim construction.²⁴⁹ But when the Federal Circuit itself was faced with the very situation it had envisioned for district court claim construction—that is, it could

247. See *supra* Part III.A.

248. *SRI Int’l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1118 (Fed. Cir. 1985) (en banc) (“It is only after the claims have been construed without reference to the accused device that the claims, as so construed, are applied to the accused device to determine infringement.” (emphasis omitted)).

249. *Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1331 (Fed. Cir. 2006) (“[T]he rule forbids a court from . . . reach[ing] a preconceived judgment of infringement or noninfringement. In other words, it forbids biasing the claim construction process to exclude or include specific features of the accused product or process.”).

not consider the accused product in its analysis because no description of the accused device existed in the appellate record (as the appeal was from a stipulated judgment)²⁵⁰—the Federal Circuit acknowledged that, without the context provided by a description of the accused device, it “cannot fully and confidently review the infringement judgment, including its claim construction component.”²⁵¹ The Federal Circuit accordingly softened its rule to allow a district court to refer to the accused device for context during the claim construction process.²⁵² This development has led at least one commentator to posit that claim construction and infringement analysis are two inquiries that are effectively merged.²⁵³ Indeed, some district judges have adopted the practice of combining claim construction proceedings with summary judgment hearings.²⁵⁴ In effect, the accused device is serving as a reference point for construing claims in federal court, which is unavoidable, given that *some* context is needed to focus the claim construction analysis.

Yet, there is a danger to allowing an accused device to serve as the primary or predominant point of reference. This is because claim constructions from one case may have preclusive effects in concurrent or future cases.²⁵⁵ (In fact, consistent with its “construe once, apply everywhere”²⁵⁶ philosophy of claim construction, the Federal Circuit has occasionally taken upon itself to construe terms that are not necessary to decide the appeal—for the benefit of future cases.²⁵⁷) A claim construction that resulted from using an accused product as the primary reference point is problematic for application in other cases because the construc-

250. *Id.* at 1330–31.

251. *Id.* at 1330.

252. *Id.* at 1331.

253. Jason R. Mudd, *To Construe or Not to Construe: At the Interface Between Claim Construction and Infringement in Patent Cases*, 76 MO. L. REV. 709 (2011).

254. MENELL ET AL., *supra* note 233, at 2-24.

255. *Id.* at 5-88 to 5-89.

256. This is an adaptation of Sun Microsystems’s “Write Once, Run Anywhere” motto for the Java programming language, which was designed for cross-platform compatibility. See *Write Once, Run Anywhere?*, COMPUTER-WEEKLY.COM (May 2002), <http://www.computerweekly.com/feature/Write-once-run-anywhere>.

257. See, e.g., *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1351 (Fed. Cir. 2004) (noting that, despite resolution of issues sufficient to support affirmance, “we consider it to be in the interest of judicial efficiency, as well as in the interest of any future litigation concerning these patents, to review the other contested claim limitations”).

tion may be idiosyncratic to that accused product in light of anchoring effects and different information sets.²⁵⁸ In addition, the selection of that particular accused product for litigation and the progression of that litigation to a final judgment for which preclusive effects may attach to the underlying claim construction would be, in a word, fortuitous. Moreover, the construction of a term often evolves during litigation as the parties' understanding of the accused product evolves or when additional accused products are added.²⁵⁹ To avoid having the first accused product unduly influence how a claim will be construed, an alternative reference point is necessary that is not case specific—which leaves few options other than the specification.

C. IMPLICATIONS, CONCERNS, AND OBJECTIONS

Because behavioral influences pervade the process of claim construction across different institutions and among different readers,²⁶⁰ its effect on the patent system as a whole may often be felt but difficult to quantify. Accordingly, whether the benefits of mitigating behavioral influences in claim construction would outweigh its costs cannot be determined in the abstract, but instead would need to be assessed in relation to the specific solution proposed for accomplishing it. For this reason, this Section will explore the impact of the all-means-plus-function claiming proposal on patentees, patent prosecution, and patent litigation. In evaluating the impact of the all-means-plus-function claiming proposal, it is worth emphasizing that it is just one possible option based on an analysis of the relevant behavioral literature and claim construction studies existing at the time this Article was written. Given the myriad ways in which behavioral elements may affect claim construction, future research may reveal other options for mitigating their effects that may have a different cost-benefit profile than the all-means-plus-function claiming proposal.

1. Policing the Disclosure Requirement

Apart from mitigating the influence of behavioral elements, applying means-plus-function analysis to all claim terms may

258. *See supra* Part II.A.1.

259. *Jack Guttman, Inc. v. Kopykake Enters.*, 302 F.3d 1352, 1361 (Fed. Cir. 2002) (“District courts may engage in a rolling claim construction, in which the court revisits and alters its interpretation of the claim terms as its understanding of the technology evolves.”).

260. *See supra* Part II.

have a beneficial side effect: a greater focus on the disclosure during prosecution. Scholars have called for strengthening the disclosure requirement,²⁶¹ which is a topic that has been the subject of renewed focus by the PTO.²⁶²

Currently, enforcing the disclosure requirement depends largely on having examiners closely review applications to ensure that each claim is adequately supported by the disclosure. But such vigilance may be difficult to maintain, given the agency problems associated with examiners and patent attorneys, each of whom handles a high volume of applications.²⁶³ Compliance with the disclosure requirement may be improved if we were to create conditions that make it: (1) strategically desirable for applicants to invest the additional resources to prepare detailed disclosures that adequately support the claims; and (2) easier for the examiner to police compliance.

To induce the applicant to prioritize disclosure issues as a matter of strategy, we can rely on the fact that patents are, at bottom, litigation instruments.²⁶⁴ The application of means-plus-function analysis to all claim terms would tie the disclosure requirement directly to an item that drives litigation strategy: claim scope. Currently, the prospect of invalidity based on a disclosure defect is not a salient concern of patentees, who have more to fear from summary judgment motions for noninfringement than those for lack of enablement or inadequate written description.²⁶⁵ Relatedly, the examiners' task of policing disclosure issues can be made easier with an all-means-plus-function

261. See, e.g., Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539, 591–92 (2009); Lisa Larrimore Ouellette, *Do Patents Disclose Useful Information?*, 25 HARV. J.L. & TECH. 545, 590–92 (2012).

262. See, e.g., *Topics Announced for Case Studies Pilot*, U.S. PATENT & TRADEMARK OFFICE: DIRECTOR'S FORUM (May 18, 2016), http://www.uspto.gov/blog/director/entry/topics_announced_for_case_studies (announcing case study entitled "Enforcement of 35 U.S.C. §112(a) written description in continuing applications").

263. See Jeremy W. Bock, *Patent Quantity*, 38 U. HAW. L. REV. 287, 318 (2016).

264. See Carl Shapiro, *Antitrust Limits to Patent Settlements*, 34 RAND J. ECON. 391, 395 (2003) ("What the patent grant actually gives the patentholder is the right to sue to prevent others from infringing the patent. . . . [A] real patent does not give the patentee 'the right to exclude' but rather the more limited 'right to try to exclude' by asserting its patent in court.").

265. In one study of patent litigation from 2008 to 2009, accused infringers won fifty-seven percent of their motions for summary judgment of noninfringement, Allison et al., *supra* note 178, at 1788, whereas summary judgment mo-

claiming rule because the analysis would primarily entail checking for the presence of corresponding embodiments and features in the specification, with less emphasis on parsing claim language—a task that examiners are unlikely to perform reliably, if at all.²⁶⁶

However, much of the above-listed salutary effects may come at the additional cost borne by patentees in connection with producing thicker specifications. In an attempt to gain broad claim coverage while avoiding the expense of creating a more detailed disclosure, some patentees might prepare specifications that are thin on details but endeavor to cover a wide range of embodiments through vague descriptions or a laundry list. In such instances, examiners may still have difficulty with reliably finding disclosure defects because their technical priors may unconsciously fill in the missing details.²⁶⁷ However, unlike the current state of affairs, the active policing of disclosures under an all-means-plus-function regime may no longer fall predominantly on the examiners.

Instead, district judges—who do not possess the examiners' technical priors—are likely to assume a key role in enforcing the disclosure requirement. This is because in an all-means-plus-function regime, the content of the disclosure would be an issue in almost every patent case: most of the infringement allegations would turn on whether the accused product is an equivalent of the disclosed embodiments,²⁶⁸ and defendants would attempt to invalidate the claim for indefiniteness based on some element not being adequately described in the specification.²⁶⁹

In the context of means-plus-function claiming, there is a close relationship between the definiteness requirement and the other major disclosure doctrines—written description and ena-

tions based on lack of enablement and inadequate written description were successful only thirteen percent and fifteen percent of the time, respectively. *Id.* at 1785 tbl.2.

266. See *supra* Parts II.A.2., II.B.1, II.C.1.

267. See *supra* Part II.B.1.

268. See *supra* note 229 and accompanying text. An equivalents inquiry may not be needed in cases of outright copying by the accused infringer, which constitute a distinct minority of patent cases. See Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1424 (2009) (“Only 10.9% of the complaints studied—21 of 193 complaints—contained even an allegation that the defendant copied the invention, either from the patent or from the plaintiff’s commercial product.”).

269. See *supra* note 230 and accompanying text.

blement—in that all three focus on the adequacy of the disclosure.²⁷⁰ Although the three requirements are distinct, a claim that is indefinite under means-plus-function analysis because the specification fails to disclose certain technical details might also have problems with written description and/or enablement.²⁷¹ Given that indefiniteness is a question of law,²⁷² and that disclosure issues are also central to analyzing infringement by § 112(f) equivalents, an all-means-plus-function regime could increase the frequency with which issues relating to the adequacy of the disclosure are decided on summary judgment.

Should the adequacy of the disclosure become a major decision point in a patent case under an all-means-plus-function regime, it is possible that district judges may develop an unconscious bias toward granting summary judgment of invalidity based on indefiniteness as a way to streamline their dockets—just as they might do currently with noninfringement.²⁷³ If such a pattern emerges, it may prompt some patentees to shift resources from claim drafting to creating more detailed disclosures.

2. Nonparsing PHOSITA

The PHOSITA, as an interpretive entity, may be a better fit for an all-means-plus-function claiming regime than the current *Phillips*/BRI regime.

Because the *Phillips*/BRI claim construction canons purport to capture the manner by which a PHOSITA would have construed the claims, it has effectively required the PHOSITA to possess a “mythical”²⁷⁴ combination of abilities: an exhaustive

270. See 35 U.S.C. § 112(a) (2012) (setting forth written description and enablement requirements).

271. See *In re Noll*, 545 F.2d 141, 149 (C.C.P.A. 1976) (observing that the “lack of any corresponding descriptions of structure in the specification upon which the scope of equivalents might be based,” could be a basis upon which to reject a patent application for failing to satisfy 35 U.S.C. § 112(a)); see also *MPEP*, *supra* note 59, § 2181 (“[A]n inadequate disclosure may give rise to both an indefiniteness rejection for a means-plus-function limitation and a failure to satisfy the written description and enablement requirements of section 112(a) or pre-AIA section 112, first paragraph.”).

272. See *Praxair, Inc. v. ATMI, Inc.*, 543 F.3d 1306, 1319 (Fed. Cir. 2008).

273. See *supra* notes 177–78 and accompanying text.

274. See Michael Abramowicz & John F. Duffy, *The Inducement Standard of Patentability*, 120 *YALE L.J.* 1590, 1604 (2011) (“[T]he courts have constructed this person with attributes acknowledged to be highly fictional, and those fictional attributes make it difficult or impossible to gain any real intuition as to the cognitive processes of the mythical PHOSITA.”).

familiarity with both the prior art *and* the principles of claim construction under the current interpretive regime. Because very few, if any, individuals would embody the attributes of this “lawyerly” PHOSITA, claim construction from its perspective may not be robust in practice. Indeed, a study by Jonas Anderson and Peter Menell of over a decade of Federal Circuit claim construction opinions suggests that claim construction rarely, if ever, turns on an analysis of who the PHOSITA is in a given case.²⁷⁵ If, in practice, an analysis of the PHOSITA’s identity is not an essential feature of construing claims under the *Phillips*/BRI regime, then perhaps claims are being construed presently in a manner that is effectively unmoored to a common interpretive entity, thereby providing an opportunity for behavioral elements to supply an interpretive entity that is convenient for whomever is reading the claim.

Unsurprisingly, some commentators have suggested alternatives to the PHOSITA construct: Greg Reilly has proposed an “ordinary reader” standard,²⁷⁶ while John Golden has argued in favor of “the perspective of a patent attorney with access to the technological knowledge of an ordinary artisan.”²⁷⁷ But maybe the problem lies not with the interpretive entity but instead with the interpretive rules. Perhaps the PHOSITA may be better suited to the proposed all-means-plus-function claiming regime, where her technical expertise would matter more.

Because means-plus-function claiming entails minimal parsing of claim language, we would no longer require claims to be construed from the point of view of a “lawyerly” PHOSITA with an unnatural talent for exegesis, but rather a “classical” PHOSITA whose “mythical” abilities would be limited to technical knowledge. Because the *Phillips*/BRI regime is designed for parsers, the PHOSITA does not have a meaningful role in that system. By contrast, in an all-means-plus-function claiming regime, the determination of claim scope would focus less on construing individual words and phrases in a claim and more on the

275. Anderson & Menell, *supra* note 39, at 55–56 (“In only 12 of the 787 (1.5%) written claim construction opinions issued from 2000 through 2011 does the Federal Circuit even identify the PHOSITA.”).

276. Greg Reilly, *Judicial Capacities and Patent Claim Construction: An Ordinary Reader Standard*, 20 MICH. TELECOMM. & TECH. L. REV. 243, 248, 288 (2014) [hereinafter Reilly, *Ordinary Reader*].

277. Golden, *supra* note 37, at 328 (arguing for “replacing the ordinary artisan rule with a rule declaring the governing perspective of claim construction to be a hybrid one: the perspective of a patent attorney with access to the technological knowledge of an ordinary artisan”).

substance of the disclosure, thereby drawing on the technical perspective of a PHOSITA to evaluate claim definiteness (by assessing the sufficiency of the disclosure of the corresponding structure, materials, or acts)²⁷⁸ as well as to determine equivalents.²⁷⁹

3. Procedural Impact

By adopting an all-means-plus-function claiming rule, the most visible procedural impact on a patent case may involve changes to the *Markman*²⁸⁰ process used by district courts to formally construe claims.²⁸¹ Currently, the *Markman* process involves parties preparing extensive briefing on the construction of individual claim terms, which is followed by a hearing and the issuance of a formal opinion by the trial court construing the claim terms separate from any infringement or validity issues.²⁸² In an all-means-plus-function claiming regime, the focus on the content of the disclosure and technical equivalents would lessen the need to closely parse claim language, resulting in a convergence between the claim language and the embodiments of the invention. This may turn claim construction into a more fact-intensive inquiry that melds with the specific liability issues in a given case, with the core issue being whether the accused product (or the prior art in an invalidity analysis) corresponds to the embodiment shown in the disclosure or an equivalent. As such, this proposal would likely take the claim construction process back to how patents were litigated at a time before *Markman*, when the boundaries of a claim were determined as part of a factual inquiry regarding infringement or validity, rather than as a standalone legal issue.²⁸³

278. See *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1378–79 (1999) (“[I]f one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by the claim language.” (quoting *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994))).

279. See *Caterpillar Inc. v. Deere & Co.*, 224 F.3d 1374, 1379 (Fed. Cir. 2000) (“[I]n the § 112, ¶ 6 context . . . an accused device is equivalent when it performs the identical function in substantially the same way to achieve substantively the same result.”).

280. *Markman v. Westview Instruments*, 517 U.S. 370, 388–89 (1996) (observing that judges, with their training in exegesis, are better suited to interpreting patent claims than a jury).

281. See MENELL ET AL., *supra* note 233, at 2-13.

282. A detailed description of the *Markman* process is provided in *id.* at chapter 5.

283. See *Burk & Lemley, Fence Posts*, *supra* note 2, at 1770–71.

Currently, trial courts rely heavily on the *Markman* process to help streamline cases via summary judgment because how a claim is construed decides the issue of infringement where the operation of the accused device is not in dispute.²⁸⁴ Under an all-means-plus-function claiming regime, however, the formal “construction” of individual claim terms during the *Markman* process might be reduced to an indefiniteness inquiry directed to whether the claim elements have corresponding structures in the disclosure.²⁸⁵ Any ensuing infringement analysis would likely entail a fact-intensive evaluation of equivalents.²⁸⁶ It is possible, then, that a greater proportion of patent cases might be tried to a jury. (Or, as discussed later in this Section, it might not.)

The jury trials that would be held under the proposed claiming regime might be an improvement over current trials. The typical jury is a group of laypeople—namely, nonparsers—who may find it easier to understand the issues in a trial conducted under the all-means-plus-function claiming proposal because the presentation on liability issues would be focused primarily on comparing the embodiments in the patent (rather than the claim language) with the accused product or the prior art, which the nonparsing lay jurors are likely to do naturally.²⁸⁷ By contrast, in a trial conducted under the *Phillips* methodology, the jury is instructed on the formal construction of multiple claim terms,²⁸⁸ with which the parties frame their presentations on infringement and validity. In other words, under the current regime, the jury must analyze the case through a layer of construed language. Under the all-means-plus-function proposal, this extra layer would be absent.

284. See MENELL ET AL., *supra* note 233, at 2-23 to 2-24.

285. See *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1308 (Fed. Cir. 1998) (“[A] determination of corresponding structure is a determination of the meaning of the ‘means’ term in the claim and is thus also a matter of claim construction.”).

286. See *Durango Assocs., Inc. v. Reflange, Inc.*, 843 F.2d 1349, 1357 (Fed. Cir. 1988) (“The determination whether an accused device is a section 112 equivalent of the described embodiment is a question of fact.”).

287. See *supra* Part II.A.2.

288. See *AFG Indus. v. Cardinal IG Co.*, 239 F.3d 1239, 1247 (Fed. Cir. 2001) (“It is critical for trial courts to set forth an express construction of the material claim terms in dispute, in part because the claim construction becomes the basis of the jury instructions, should the case go to trial.”); MENELL ET AL., *supra* note 233, at 5-28 to 5-29 (discussing the *Markman* process in the context of the respective roles of the court and the jury).

Whether the proportion of patent cases with jury trials will materially increase under an all-means-plus-function claiming regime is difficult to predict because courts may adopt coping mechanisms to streamline their workload, especially given the labor-intensive nature of jury trials. As discussed previously, docket pressures may exert a powerful behavioral impact on adjudication outcomes.²⁸⁹ An appreciable increase in the number of jury trials in patent cases, which tend to be complex, could substantially burden the trial courts, which could react in a couple of ways. For example, courts might modify existing procedures (e.g., local rules)²⁹⁰ or adopt new ones that have the effect of delaying the trial date, thereby providing parties more time to settle before trial. An example of this would be changing the rate of granting stays pending parallel proceedings in the PTO.²⁹¹ District judges determined to streamline their dockets might also begin granting summary judgment on validity issues more often in order to compensate for any decrease in opportunities for granting summary judgment of noninfringement in an all-means-plus-function claiming regime that blends claim construction and infringement into a fact-intensive equivalents inquiry.²⁹² The validity issues that would most likely see an increase in summary dispositions would be those that are questions of law (e.g., indefiniteness, enablement, obviousness).

However, much of the impetus for the procedural adaptations described in the immediately preceding paragraph may be lost if the absolute number of patent cases were to fall, so as to yield an absolute decrease in the number of jury trials, despite an increase in the proportion of patent cases that make it to a

289. See *supra* Part II.C.1.

290. The patent local rules were originally created to streamline the handling of patent cases. See generally James Ware & Brian Davy, *The History, Content, Application and Influence of the Northern District of California's Patent Local Rules*, 25 SANTA CLARA COMPUTER & HIGH TECH. L.J. 965 (2009).

291. Over the past several years, the rate of granting stays for inter partes review has varied among district courts, ranging from thirty-seven percent to eighty-six percent. DICKEY, *supra* note 199.

292. To be clear, district courts have granted, and the Federal Circuit has affirmed, the grant of summary judgment of noninfringement based on lack of equivalence. See, e.g., *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1345–46 (Fed. Cir. 2016) (affirming summary judgment of noninfringement of means-plus-function claim for lack of equivalence); *Baran v. Med. Device Techs., Inc.*, 616 F.3d 1309, 1316–18 (Fed. Cir. 2010) (same); *Welker Bearing Co. v. PHD, Inc.*, 550 F.3d 1090, 1099 (Fed. Cir. 2008) (same). The fact-intensive nature of the equivalence inquiry makes the grant of summary judgment more difficult compared to an analysis that depends solely on the claim construction under the current *Phillips*/BRI regime.

jury. If claim scope were generally narrower under an all-means-plus-function claiming regime,²⁹³ then fewer suits might be filed, particularly in the high technology industry, as discussed in the next Subsection.

4. Claim Scope and Error Costs

Because claim scope under means-plus-function analysis is limited to the structures, materials, and acts disclosed in the specification and their equivalents,²⁹⁴ patentees might feel compelled to file heftier specifications describing numerous embodiments in order to obtain adequate claim coverage. These concerns are seemingly reflected in application filing trends that suggest patentees generally disfavor²⁹⁵ means-plus-function claim terms, which, in recent years, are present in less than ten percent of published patent applications.²⁹⁶

When concerns about narrow claims and thick specifications are weighed against the potential enhancement to social welfare that might result from an all-means-plus-function claiming regime, the net effect is expected to be positive. As an initial matter, this claiming rule may not always result in a narrower scope overall when compared to a “plain meaning” construction, given that the boundaries of a means-plus-function claim include an equivalence aspect.²⁹⁷ To the extent that means-plus-function claims may be narrower, they may be less susceptible to invalidation based on prior art.

More importantly, the current *Phillips*/BRI regime does not have an efficient mechanism for policing claim overbreadth. Specifically, “plain meaning” constructions are susceptible to the “*Morse* problem,”²⁹⁸ whereby the scope of a claim may be stretched beyond the specific solution (and equivalents) invented by the patentee so as to cover embodiments that the patentee

293. See *infra* note 295 and accompanying text.

294. 35 U.S.C. § 112(f) (2012).

295. See, e.g., Nicholas R. Mattingly, *Avoiding Invocation of Functional Claim Language in Computer-Implemented Inventions*, IPWATCHDOG (June 18, 2015), <http://ipwatchdog.com/2015/06/18/avoiding-invocation-of-functional-claim-language-in-computer-implemented-inventions/id=58803> (“[D]rafting claims that avoid the invocation of [35 U.S.C.] § 112(f) is the first line of defense for . . . unnecessarily narrowing the scope of the invention.”).

296. Dennis Crouch, *Means Plus Function Claiming*, PATENTLY-O (Jan. 14, 2013), <http://patentlyo.com/patent/2013/01/means-plus-function-claiming.html>.

297. Cotropia, *Deference*, *supra* note 162, at 1102 n.27.

298. See *O’Reilly v. Morse*, 56 U.S. 62 (1853).

either chose not to disclose or failed to contemplate.²⁹⁹ A related phenomenon is functional claiming, in which patentees use functional claim language (that has been crafted to avoid triggering means-plus-function analysis) in order to claim all implementations that achieve a particular result.³⁰⁰ Overly broad claims that allow patentees to capture a wide range of embodiments they did not actually disclose may stifle the introduction of alternative or improved products to the market³⁰¹ and deprive the public of the detailed descriptions of those embodiments over which the patentee has been granted exclusive rights. Overclaiming and unfair surprise to the public could become less prevalent with a central-claiming-type rule (such as the all-means-plus-function claiming proposal) where the focus is on the substance of the invention, rather than the language of the claims,³⁰² and claim scope would closely follow the disclosure—an item of public record that is fixed in time³⁰³ and to which every reader of a patent claim has access.³⁰⁴

The impact of an all-means-plus-function claiming regime may vary according to the type of technology, especially where prosecution practices may differ as a result of technology-dependent precedents.³⁰⁵ For example, Federal Circuit case law imposes a more rigorous disclosure requirement for biotechnology inventions compared to software inventions.³⁰⁶ Because biotechnology claims are prone to being limited to what is disclosed

299. Instead of limiting his claim to what he actually invented (i.e., the telegraph), *id.* at 108, Samuel Morse sought to claim “the essence” of his invention, which is “the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed,” *id.* at 112. The court found this claim to be “too broad, and not warranted by law.” *Id.* at 113; *see also* Lemley, *Functional Claiming*, *supra* note 139, at 930 (“[P]atentees can often benefit from ambiguous patent claims by twisting the language of the patent claim to cover something the inventor never in fact had in mind at the time.”).

300. *See* Lemley, *Functional Claiming*, *supra* note 139, at 907–08.

301. *See id.* at 912.

302. Burk & Lemley, *Fence Posts*, *supra* note 2, at 1762.

303. There may be changes made to an issued patent through reissues or reexaminations.

304. Patents are widely available and searchable through the PTO website, <https://www.uspto.gov/patents-application-process/search-patents#heading-1>, as well as other online resources such as Google Patents, <https://patents.google.com>.

305. *See generally* Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology Specific?* 17 *BERKELEY TECH. L.J.* 1155 (2002) [hereinafter Burk & Lemley, *Technology Specific*].

306. *Id.* at 1156.

in the specification,³⁰⁷ it is likely that the patent portfolios of biotechnology companies already contain numerous patents with thick disclosures and narrow claims.³⁰⁸ As such, for the biotechnology industry—where patents often directly impact a company's commercialization plans³⁰⁹—the all-means-plus-function claiming proposal is likely to have a neutral or muted business impact, as it is unlikely to result in a dramatic change to its prosecution or litigation practices.

In contrast to patents covering biotechnology inventions, those relating to high-technology inventions (such as electronics and software) are currently subject to a relatively weak disclosure requirement,³¹⁰ and often contain functional claim terms that effectively allow the patentee to claim all the solutions to a given problem or all the ways of implementing a concept, rather than a specific solution or a specific implementation that the patentee actually developed.³¹¹ As a result, the all-means-plus-function claiming proposal is likely to have a dramatic impact on the patent portfolios in the high-technology industry: patentees may be prompted to file thicker specifications with more embodiments, and the aggregate claim scope of most patents may be substantially narrower as they will cover only the content of the disclosure and any equivalents. As a consequence, this could depress the number of patent suits involving the high-technology industry. Despite a dramatic impact on prosecution and litigation practices, it is possible that the net business impact of the all-means-plus-function claiming proposal may be muted in the high-technology industry, given that the link between patenting and innovation appears to be inconclusive for industries other

307. *Id.* at 1181–82.

308. *See id.* at 1182.

309. *See* Benjamin N. Roin, *Unpatentable Drugs and the Standards of Patentability*, 87 TEX. L. REV. 503, 545–47 (2009) (describing how development efforts for a drug might be halted if patent protection were to be denied for that drug).

310. *See* Burk & Lemley, *Technology Specific*, *supra* note 305, at 1185.

311. *See* Lemley, *Functional Claiming*, *supra* note 139, at 907–08.

than biotechnology,³¹² and high-technology companies appear to routinely ignore patents when deciding to introduce products.³¹³

Given the difficulty of using words to capture an invention with precision,³¹⁴ means-plus-function claiming might be ultimately less costly, as it allows the invention to be claimed without the abstract wordsmithing required under the current peripheral claiming regime.³¹⁵ As Doug Lichtman has observed, “the costs of drafting bulletproof claim language can be substantial,”³¹⁶ and the marginal benefit for improving claim language is rather small given that most patents are not read,³¹⁷ let alone litigated.³¹⁸ Furthermore, given the inherent limitations of language,³¹⁹ the level of linguistic precision necessary for a well-functioning peripheral claiming regime may not, in fact, be achievable in many cases,³²⁰ especially for the most innovative inventions for which the relevant terminology has not yet matured.³²¹

312. See, e.g., Paul J. Heald, *A Transaction Costs Theory of Patent Law*, 66 OHIO ST. L.J. 473, 474 (2005) (summarizing literature); Edwin Mansfield, *Patents and Innovation: An Empirical Study*, 32 MGMT. SCI. 173, 180 (1986) (“Despite the fact that the patent system generally is defended at least partly on the grounds that it increases the rate of innovation, the present study indicates that its effects in this regard are very small in most of the industries we studied.”).

313. See Mark A. Lemley, *Ignoring Patents*, 2008 MICH. ST. L. REV. 19, 20–21 (“[C]ompanies do not seem much deterred from making products by the threat of . . . patent litigation. Intel continues to make microprocessors, Cisco routers, and Microsoft operating system software, even though they collectively face nearly 100 patent-infringement lawsuits at a time and receive hundreds more threats of suit each year.”).

314. See, e.g., *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 396 (Ct. Cl. 1967) (“The very nature of words would make a clear and unambiguous claim a rare occurrence.”).

315. See Fromer, *supra* note 49, at 777.

316. Lichtman, *supra* note 123, at 2015.

317. *Id.*

318. See Lemley, *Rational Ignorance*, *supra* note 169, at 1501 (estimating that “at most only about two percent of all patents are ever litigated”).

319. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002) (“The language in the patent claims may not capture every nuance of the invention or describe with complete precision the range of its novelty.”).

320. See, e.g., Margaret Jane Radin, *Patent Notice and the Trouble with Plain Meaning*, 96 B.U. L. REV. 1093, 1116 (2016) (“[T]he idea that patent claim notice could be rendered precise enough to justify an analogy with physical fences is illusory.”).

321. *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 397 (Ct. Cl. 1967) (“Often the invention is novel and words do not exist to describe it. The dictionary does not always keep abreast of the inventor. It cannot. Things are not made for the sake of words, but words for things.”); Reilly, *Ordinary Reader*, *supra*

Some may wonder if the notice function of patents might be undermined by means-plus-function claiming because an equivalents analysis may be required to determine literal infringement. Although this claiming regime may not yield the most precise claims, they may perform an adequate job in most instances.³²² To the extent that there might be uncertainty in claim scope, Jeanne Fromer observes that “[u]ncertainty in peripheral claims lies in the precise reach of each of the claim words, whereas uncertainty in central claims [of which the proposed all-means-plus-function claims would be a derivative] lies in how many embodiments will be found to be substantially similar to the more limited claimed set.”³²³ That is, unlike the current regime, any uncertainty in claim scope associated with the all-means-plus-function claiming proposal would not be an artifact of wordsmithing, but would instead require resolution through an evaluation of the substance of the invention. Under the proposal, it is expected that most readers will arrive at similar first-order approximations of claim scope,³²⁴ which may be adequate for most purposes, while the labor-intensive and costly determination of the precise boundaries of the claim based on an analysis of equivalents can be delayed until litigation actually occurs.

CONCLUSION

This Article presents a detailed exploration of the behavioral influences that may affect how patent claims are construed. The current claim construction rules yield assessments of scope that are highly susceptible to being influenced by a reader’s cognitive biases, priors, and situational considerations. This is because the current process for construing claims requires the legalistic parsing of claim language, which entails exercising judgment and discretion in the choice of conflicting canons and the selection of sources from an open universe to yield a wide range of potential constructions that may be plausibly rationalized. A rule of construction that would be more resistant to the influence of behavioral elements would be one that minimizes

note 276, at 265 (listing examples illustrating how the limitations of language may affect how inventions are claimed).

322. See Fromer, *supra* note 49, at 765 (“Even if central claims do not provide perfect content notice of categorical boundaries, the evidence indicates that it might do a good job at communicating the crux of the protected embodiments.”).

323. *Id.* at 776.

324. See *supra* Part III.B.

parsing and ties claim scope to the embodiments in the disclosure and its equivalents. Such a rule may be implemented by extending means-plus-function analysis to all claim terms. Because behavioral influences pervade multiple aspects of the process of construing claims, future research may reveal other ways to mitigate their impact.