Claim Construction, Appeal, and the Predictability of Interpretive Regimes

Jeffrey A. Lefstin, Ph.D.[1]

ABSTRACT

Interpretation is central to patent law, because most adjudications require association of written claims with non-linguistic subject matter. By some accounts, the lack of predictability in the law of claim interpretation has reached crisis proportions, and has prompted calls for far-reaching changes in the way patent issues are adjudicated. However, the actual evidence that questions of interpretation are more problematic than other aspects of patent law is sparser than is commonly recognized. Moreover, while the controversy over claim interpretation centers around the predictability of interpretation between trial and appeal, what is important is to be able to predict outcomes before any trial at all. But if claim interpretation questions are unusually unstable on appeal, what explains the peculiar character of claim interpretation? Conventional explanations relying on the indeterminacy of the substantive legal regime, or the relative expertise of trial and appellate judges, are insufficient. Instead, interpretive questions may be unusually susceptible to cognitive effects arising from differences between trial and appeal processes with respect to information content and information order. If so, the paths to predictability in

[1] Assistant Professor of Law, University of California, Hastings College of the Law. I am grateful to Robin Feldman for useful comments on this essay.

interpretation are radically different from those currently implemented by the Federal Circuit or proposed as future reforms.

INTRODUCTION

In patent law, there are few problems more significant, or more hotly debated, than the problem of interpretation. Interpretation is central to patent law because questions of patent infringement and patent validity cannot be resolved without first defining the scope of the patent right. That scope is defined by words - "claims" - which mark the boundaries of the inventor's property right. Like any legally operative language, patent claims must be interpreted in order to resolve questions about the rights and obligations they create. To determine whether someone has infringed the patent, or to determine whether the inventor has satisfied the statutory requirements for a valid patent, we must translate the words of the claims onto complex technological and commercial landscapes. But if interpretation is at the core of patent law, there are many who claim that the core is now rotten. Whether the fundamental inquiry of patent law is broken, and what do to about, are debates currently engross not only observers of the patent system, but also the judges of the appellate court entrusted with control of the patent law, the United States Court of Appeals for the Federal Circuit.

The Supreme Court set the stage for the debate in *Markman v. Westview Instruments*,[2] when it declared that the interpretation of patent claims was a question reserved exclusively for the judge, and not the jury.[3] Ever since *Markman* the question of how to structure the process of claim interpretation has divided the judges of the Federal Circuit, sometimes bitterly.[4] In 1998 Federal Circuit held *en banc* in *Cybor Corp. v. FAS Technologies* that it would accord no deference to the district courts on questions of interpretation, treating claim interpretation as a pure question of law subject to *de novo* review on appeal. *Cybor* severely divided the Federal Circuit, drawing five additional separate opinions from judges of the court. But it apparently settled little. In 2006 the

[2] 517 U.S. 370 (1996)
[3] Id. at 391.
[4] *See, e.g.*, Phillips v. AWH Corp., 415 F.3d 1303, 1334-35 (Fed. Cir. 2005) (en banc) (Mayer, J., dissenting) ("If we persist in deciding the subsidiary factual components of claim construction without deference, there is no reason why litigants should be required to parade their evidence before the district courts or for district courts to waste time and resources evaluating such evidence. . . . Eloquent words can mask much mischief. The court's opinion today is akin to rearranging the deck chairs on the Titanic--the orchestra is playing as if nothing is amiss, but the ship is still heading for Davey Jones' locker.")

court's refusal to re-examine *Cybor* matched *Cybor* itself in controversy, drawing no less than six separate opinions.[5] In the interim the debate over claim interpretation has been stoked by an avalanche of critical commentary decrying the "unpredictability" of the *Markman - Cybor* regime. The principal fuel for this debate has been a large number of empirical studies finding that the Federal Circuit reverses district courts based on claim construction issues at an unacceptably high rate.[6] At least as far as empirical studies go, no aspect of patent law has been scrutinized more closely than the process of claim interpretation.

High reversal rates on claim interpretation trouble observers and participants of the patent system, mostly because claim interpretation is fundamental to patent scope. In most instances, we define what "the patent" or "the invention" is solely by reference to the scope of the patent's claims. Once the district court construes the claims, all subsequent determinations of whether "the patent" is infringed or whether "the invention" is patentable are defined by the construction of the claims. Patent infringement actions are among the most lengthy and complex cases handled by the judicial system. Litigants find it disconcerting when, having litigated a case under the district court's definition of the patent, they find they must start anew because the Federal Circuit has disagreed with the district court's construction of the claims.[7]

The perception of high reversal rates has therefore prompted many proposals from commentators, judges, and legislators, to change the process of claim construction or even to restructure the process of patent adjudication entirely. The most prevalent argument, claiming that the *de novo* standard of review is responsible for high reversal rates, proposes that the Federal Circuit should adopt a more deferential standard of

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[5] Amgen Inc. v. Hoechst Marion Roussel, Inc., 469 F.3d 1039 (Fed. Cir. 2006) (denial of rehearing en banc).

[6] *See, e.g.*, Kimberly A. Moore, *Markman Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK. L. REV. 231 (2005); Andrew T. Zidel, *Patent Claim Construction in the Trial Courts: A Study Showing the Need for Clear Guidance from the Federal Circuit*, 33 SETON HALL L. REV. 711, 741-42 (2003); Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075, 1104 (2001); Gretchen Ann Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time is Ripe for a Consistent Claim Construction Methodology*, 8 J. INTELL. PROP. L. 175, 207 (2001); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1, 8-10 (2001);

[7] The problem is compounded by the Federal Circuit's refusal to entertain interlocutory appeals on questions of claim construction.

review for district court claim interpretations.[8] A slightly less common argument, identifying the lack of district court expertise as the root of the problem, proposes to withdraw the task of construing claims from the district courts. Some reformers have proposed that patent litigation be taken out of the hands of the generalist courts and entrusted to more specialized courts - either selected district courts with patent expertise,[9] or specialized patent courts outside of the existing judicial regime.[10] Others suggest that claims ought to be construed by bodies that are extra-judicial entirely.[11]

I wish in this essay to explore three closely related questions that are significant to this debate. First, is the instability or unpredictability of claim interpretation as serious a problem as is commonly supposed? Many studies have examined the rate at which district courts err on claim construction issues, but few have shown that claim interpretation is more error-prone than any other issue in patent law. But even if the district courts are reversed at unusually high frequencies on claim construction issues, stability of claim interpretation rulings between trial and appeal is of secondary importance compared to the predictability of claim interpretation before trial begins. Measures proposed to increase the stability of claim interpretation between trial and appeal may decrease the predictability of claim interpretation *ex ante*.

The second question I wish to address is, assuming the frequency of reversal on claim interpretation rulings is unusually high, what is it about claim construction that generates so much instability between trial and appeal? Conventional explanations posit that the law of claim interpretation promulgated by the Federal Circuit is too indeterminate, or that district courts need more experience to accurately construe patent claims. But neither theory is sufficient to explain why claim interpretation rulings are

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[8] *See, e.g.*, *Amgen*, 469 F.3d at 1040-41 (Michel, C.J., and Rader, J, dissenting from denial of rehearing); id. at 1044-45 (Rader, J., dissenting from denial of rehearing); id. at 1045 (Gajarsa, J, Linn, J., and Dyk, J. concurring in denial of rehearing) ("Our concurrence should not be read as . . . an unqualified endorsement of the en banc decision in *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998). In an appropriate case we would be willing to reconsider limited aspects of the *Cybor* decision."); id. at 1045-46 (Moore, J., dissenting from denial of rehearing).

[9] *See, e.g.*, Improving Federal Court Adjudication of Patent Cases: Hearings Before the Subcomm. on Courts, the Internet and Intellectual Property of the H. Comm. on the Judiciary, 109th Cong., 109-59 (Oct. 6, 2005) (testimony of Kimberly A. Moore, Professor of Law, George Mason University School of Law) (citing reversal rate in support of proposal to allocate patent cases to select district court judges).

[10] *See, e.g.*, Note, *Toward Certainty and Uniformity in Patent Infringement Cases After* Festo *and* Markman*: A Proposal for a Specialized Patent Trial Court with a Rule of Greater Deference*, 7 S. CAL. L. REV. 1383 (2004); Arti K. Rai, *Specialized Trial Courts: Concentrating Expertise on Fact*, 17 BERKELEY TECH. L.J. 877 (2002).

[11] John F. Duffy, *On Improving the Legal Process of Claim Interpretation: Administrative Alternatives*, 2 WASH. U. J.L. & POL'Y 109 (2000).

peculiarly unstable between trial and appeal. I suggest that it is not differences between trial and appellate decision-makers that leads them to disagree on interpretive questions. It is differences between the trial and appellate processes that generates disparate outcomes. These differences are rooted both in the unique position occupied by interpretation in patent adjudication, and in the particular cognitive processes by which legal observers generate legal interpretations.

Lastly, given the causes for the instability of claim construction rulings, what measures are likely to improve matters? If unpredictability is rooted in the processes by which different courts construct meaning, then the commonly proposed solutions - more deference or specialized courts - are unlikely to improve the predictability of interpretation. Predictability can be achieved only by closely controlling the process by which interpretive information is generated and received, and by aligning the process of interpretation as closely as possible between trial and appellate courts. These prescriptions run counter with the current claim interpretation regime, and with most current proposals for reform as well.

I. IS CLAIM CONSTRUCTION TOO UNPREDICTABLE?

A. The evidence for unpredictability

Judge Rader may have launched a thousand studies when, dissenting from the Federal Circuit's decision in *Cybor*, he asserted that the Federal Circuit had reversed nearly 40% of district court claim constructions in the two years following *Markman I*.[12] Since Judge Rader's calculation, calculating the reversal rate of claim construction cases has been popular sport: numerous studies have reported reversal rates on claim construction issues from about 25% to 40%.[13] From these statistics, each study proceeds to the conclusion that the frequency of reversals is "too high. " By now this fact seems firmly lodged in the minds of commentators, practitioners, and judges alike, and is typically the first premise invoked in support of arguments to overhaul the current system of adjudicating patent infringement disputes.[14]

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[12] *Cybor*, 138 F.3d at 1476.
[13] *See* Moore (2005) *supra* note **, at 234-36 (reviewing empirical studies).
[14] *See Amgen*, 469 F.3d at 1030 (Michel, C.J., dissenting from denial of rehearing) (citing high reversal rates as reason to re-examine *de novo* review); Moore, [House testimony], *supra* note ** (citing high reversal rates as reason for directing patent cases to selected courts).

Two problems arise in relying on such statistics. The first is a relatively minor methodological concern: the magnitude of the reversal rate is dependent on the choice of denominator. All reversal frequencies are obtained by dividing the number of claim construction reversals by the number of claim construction cases. Concealed beneath the simplicity of this calculation are disagreements about exactly how to measure "the number of claim construction cases." Does it include instances where the appellate court affirms the district court's judgment without opinion?[15] Where the issue of claim construction was incidental to either court's opinion?[16] Where the district court's claim construction was wrong but the judgment is nonetheless affirmed?[17] What of those cases where claim construction was litigated but not contested on appeal – or where the case was never appealed at all? Which database of court opinions serves as the foundation of the dataset? Each choice affects the magnitude of the reversal rate, and not every study details its criteria for inclusion or exclusion. Yet most of these complications have been recognized by thoughtful commentators,[18] and are primarily an obstacle in comparing the results of one study with another.[19]

The second problem, while related to the first, is far more serious. Although there are many anecdotal and empirical analyses showing that the rate at which the Federal Circuit overturns district court claim constructions is "high," there is almost no evidence showing that the rate of reversal on claim construction issues is "high" *relative to anything else*. Debating which methodology yields the most accurate measure of claim construction reversal rates accomplishes little, unless we can agree that some level of reversals should be cause for concern. Presumably, our view on whether claim construction is problematic would depend on whether reversal rates for claim construction issues are exceptional compared to reversal rates on other legal issues.

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[15] *See* Moore (2005), *supra* note **, at 235-37 (discussing effect of including or excluding summary affirmances)

16 *Compare* R. Polk Wagner and Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105, 1145-47 (2004) (restricting empirical study to opinions with "observable claim construction analysis") with Jeffrey A. Lefstin, The Measure of the Doubt: Dissent, Indeterminacy, and Interpretation at the Federal Circuit, 58 Hastings L.J. **, ** (2007) (including all opinions in which claim construction was appealed).

17 *See* Moore (2005), *supra* note **, at 239 (showing affirmances notwithstanding errors in claim construction).

18 *See generally* Moore (2005), *supra* note ** at 234-38.

19 The exclusion of summary affirmances substantially elevates the reversal rate. See id. at 235-36. Authors other than Moore have not included summary affirmances in their calculations, which at least renders them comparable to each other.

Unfortunately, very little of the literature includes a comparison between claim construction and any other legal issue. Measurements of reversal rates for other legal issues do exist, especially in the political science literature; when compared with these reversal statistics, those measured for claim construction do not seem exceptional.[20] But comparisons of reversal rates between different studies are unreliable, if not meaningless. Discrepancies between the underlying datasets, and discrepancies between methods of data collection, mean that the statistics retrieved by each study are tied to that study's methodology and are usually not comparable to statistics from other studies.[21]

Perhaps the only studies permitting us to directly compare claim construction with other issues are those of Professor (now Judge) Kimberly Moore.[22] She reported that, from April, 1996 through December, 2000, the Federal Circuit found fault with the district court's claim construction in 33% of claim construction cases appealed to the Federal Circuit and resolved on the merits.[23] In a separate study, for cases tried at district courts between 1983 and 1999 and then appealed to the Federal Circuit, Moore found that judgments of the district courts were reversed or vacated at a frequency of 20% on infringement issues, 22% on invalidity, 24% on enforceability,[24] and 15% on willful infringement.[25] Assuming that Moore's methodology remained constant between the studies, and discounting the difference in time frames, there is there is no reason to doubt the accuracy of this data. This comparison does suggest that district courts are reversed more frequently on claim construction than on other issues.[26] Nonetheless it is a relatively small foundation for the great volume of commentary asserting that district courts face significantly greater difficulties with claim construction than with other questions of patent law.[27]

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[20] For example, Songer, Sheehan and Haire report reversal rates ranging from 25% to 36% for all cases at the various U.S. Circuit Courts of Appeal for the period 1925 to 1988. Donald R. Songer, Reginald S. Sheehan, and Susan B. Haire, CONTINUITY AND CHANGE ON THE UNITED STATES COURTS OF APPEALS 105 (2000).

[21] *See* text accompanying nn. * supra; See also Moore (2005) at 234-238 (showing how changes in inclusion criteria affect reversal rates).

[22] Moore, 15 HARV. J. L. & TECH. 1 (2001).

[23] Id. at 11-12

[24] This category is presumably dominated by issues of inequitable conduct.

[25] Moore, 99 MICH L. REV 365, 399; Moore, 15 HARV. J. L. & TECH. at 17.

[26] Though there may be some question whether these numbers prove a statistically significant difference in the probability of reversal between claim construction and other issues. See note ** *infra*.

[27] The comparison is further complicated because reversal on claim construction and reversal on invalidity or infringement are highly correlated. Further, as Moore points out, the frequency of reversal might be measured either by the percentage of cases which were reversed, or by the percentage of claim

B. Post-trial versus ex ante *reckonability*

Putting such evidentiary questions aside, let us assume that the consensus of the literature is true, and that district courts are reversed more frequently on matters of claim construction than on other matters. If so, then the outcome of patent litigation is certainly unstable in the interval between the decision of the district court and the decision of the Federal Circuit. We could certainly remedy this state of affairs by according more deference to the district court's claim construction on appeal, as both commentators and judges have proposed. Yet, while consistency between the trial and appellate courts is certainly desirable, it cannot be our only goal. If we desired only perfect stability, we could dispense with appeal altogether.

If the stability of the district court's ruling is but one of several competing aspirations for a patent adjudication process, how important is it? More stable claim constructions by the district courts would certainly mean fewer cases in which the district courts must repeat an entire trial because the claim construction underlying the first trial was reversed on appeal. Parties, more confident that the district court's judgment would coincide with the Federal Circuit's, might be more likely to settle cases following a judgment by the district court, or accept the decision of the district court and carry on with their lives rather than appeal. But many patent cases will include disputes over infringement and invalidity issues that do not depend on how a dispute over claim construction is resolved. Some fraction of these infringement and invalidity disputes will be litigated to a final judgment, virtually guaranteeing an appeal in light of the miniscule cost of an appeal relative to a full trial.[28]

More to the point, what happens between the judgment of the district court and the judgment of the appellate court is ultimately a question about one step in the internal workings of the judicial process. We might, if we were so inclined, treat the entire

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constructions that were reversed. Moore (2001) at 11; Moore (2005) at 238. The percentage of district court claim constructions reversed by the Federal Circuit in Moore's study was 28%. Moore (2001) at 11. Because more than one claim construction may be at issue in a given case, the percentage of cases reversed will always exceed the percentage of claim constructions reversed. In general, if we assume each legal determination by a district court carries with it a certain probability of error or disagreement with the appellate court, then the probability of reversal will increase as the number of legal determinations per case increases.

[28] One survey of the cost of patent litigation estimated the median total cost to be $500,000 - $2,500,000, depending on the amount at risk in suit. Am. Intellectual Prop. Law Assoc., REPORT OF THE ECONOMIC SURVEY 2003, at 22 (2003). The cost of an appeal would be on the order of 1% of this total. See Trubeck et al., *The Cost of Ordinary Litigation*, 31 UCLA L. REV. 72, 91 (1983) (finding that on average 0.9% of attorney time in trial is spent on appeals and enforcement).

judicial system as a black box - complaints go in, final judgments come out - without worrying about the internal fluctuations of the system. Traditionally, the ability of legal practitioners to accurately predict outcomes of the appellate process following trial - "reckonability," in Llewellyn's words - has received the lion's share of our attention.[29] But at least in patent litigation, we may question whether this particular step of the judicial process warrants the degree of attention it has received. Most of the non-legal actors who obtain, assert, or infringe patents are *ex ante* indifferent to disagreements between levels of the judicial system, or to disagreements about methodologies of claim construction. The acts precedent to entanglement in the patent system are all deliberate ones –whether to invest in developing new patentable technology, or whether to market a potentially infringing product. These decisions (ideally) require accurate assessment of the scope of potential or existing patent rights. Given that few patents are litigated, and fewer still proceed to trial, even under the current "unpredictable" regime of claim construction,[30] such assessments are far more frequent, and far more economically significant, than those made by parties trying to forecast the outcome of an appeal before the Federal Circuit. Whether a practitioner can adequately predict the scope of a patent's claims *ex ante* is a far greater concern than whether a practitioner can predict the internal operation of the litigation process. If we are concerned about whether the patent system furthers the end of properly allocating resources to innovation and competition, then predictability is paramount not during the interval between trial and appeal, but the time long before any trial begins. This is the time when actors must decide whether to invest resources in developing inventions, whether to pursue patent protection, whether to embark upon potentially infringing business ventures, or whether to initiate infringement litigation. It is when accurate prediction of the scope of patent claims is most useful.

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[29] Llewellyn, after spending three hundred and eighty-two pages on the predictability of the appeal once the trial has finished, spends two pages noting that his study may have value for the "office counsel" as well. Karl N. Llewelln, THE COMMON LAW TRADITION : DECIDING APPEALS, 17-18 (defining problem as 'reckonability' of appeals); 382-84 (discussing applicability of conclusions to counseling). Llewellyn denied the predictability of ultimate outcome at the pre-litigation stage, arguing that prior to commencement of a legal action the "whole picture must be discounted as still subject to skewing or scuttling by the uncontrollable possible early appearance in some unhappy forum of a parallel situation botched by some other outfit in the doing and by ninnies in the litigating." Id. at 17.

[30] *See* Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1501 (2001) (estimating that only 2% of all issued patents are ever litigated, with fewer than two-tenths of one percent going to court).

We might therefore be content if an experienced (and honest) practitioner could adequately predict the scope of a patent claim, perhaps as it would ultimately be construed by a final decision-maker. Ossifying the claim construction of the district court – for instance, by instituting a more deferential standard of review of district court claim constructions - would not promote *that* predictability, unless district court judges are inherently more reckonable to practitioners than Federal Circuit judges are. If anything, the opposite seems more likely to be true: the experienced patent practitioner, inasmuch in that they are focused on patent law and accustomed to wrestling with the scope of patent claims, resembles the specialized Federal Circuit judge far more than the generalized district court judge. This line of reasoning suggests that we can achieve predictability simply by aligning the personal characteristics of the predictor and the decision maker. Think like an appellate judge, in other words, and you can predict their decisions – and, if we are concerned about intra-judicial stability, we can make district court judgments more stable on appeal by making district court judges more like appellate judges. This prospect is attractive but, in the end, I believe it to be naïve. To explain why, we must delve deeply into the question of why claim construction rulings are unusually vulnerable on appeal, and a deceptively simple related question: why, exactly, are the rulings of lower courts reversed?

II. WHY IS INTERPRETATION EXCEPTIONAL?

A. Indeterminacy and Deference

The most natural (and most common) explanations for unusually high claim construction reversal rates are two: either that the law of claim construction is too indeterminate to yield predictable outcomes, or that the de novo standard of review imposed by *Cybor* leaves district court rulings too vulnerable to challenge on appeal. While both explanations certainly contribute to the incidence of reversals, neither ultimately can account for disproportionately high reversal rates on the issue of claim construction.

It is worthwhile to begin by asking why trial courts are ever reversed by appellate courts. Barring an intervening change in the law, all such reversals represent disagreement between trial and appellate judges. Assuming judges conscientiously attempt to follow the law, such disagreements may arise from legal indeterminacy. If all

judicial observers agreed that particular legal principles dictate one and only one outcome on a given set of facts, then few or none would disagree on the disposition of a case.[31] But if, for whatever reason,[32] similarly situated observers find different outcomes (or multiple outcomes) permissible under a given legal regime, then disagreement may arise because judges exercise personal discretion to decide the outcome of an indeterminate case. [33]

If the law of claim construction was less determinate than other aspects of patent law, then we would certainly observe an increased frequency of reversal on claim construction issues relative to other issues. However, we would also observe an increased frequency of appellate dissent. The same lack of legal constraints that permits trial and appellate judges to disagree also permits appellate judges to disagree with each other. Confirming this prediction, statistical studies show that reversal of the lower tribunal is associated with an increased probability of dissent at the appellate level. [34] Thus, if the law of claim construction was unusually indeterminate, an increased rate of reversal would be accompanied by an increased rate of dissent. Such an increase is not observed. Based on a comprehensive study of dissent at the Federal Circuit, I have shown that from 1998 to 2005 there was little or no evidence that claim construction issues provoked dissents any more frequently than other issues in patent appeals.[35] If dissent measures of legal indeterminacy, then the law of claim construction seems no less determinate than any other aspect of patent law. Nor is there any evidence that claim interpretation is any less determinate than another well-established interpretive regime, contract interpretation.[36] Therefore, if claim construction is exceptional, it is not exceptional simply because district courts are reversed at elevated frequencies. It is

[31] I am here employing an operational definition of legal determinacy, concerned primarily with outcomes. See Lefstin (2007). The question is not whether particular legal principles are determinate in any absolute or philosophical sense, but whether a particular community of observers (i.e., federal judges) would agree that the law constrains outcomes.

[32] We may recognize what we might call genuine legal errors - instances where the law is sufficiently clear that all similarly situated observers would agree it dictates a particular outcome, but one or more legal actors has, on this occasion, failed to perceive the controlling principles. One might imagine legal principles that are very difficult for observers to perceive, but that yield agreement once they are perceived. Operationally such principles are indeterminate until such time as they are universally recognized.

[33] *See* Songer, Sheehan, and Haire, , *supra* note **, (describing consensus among political scientists that dissent at intermediate appellate courts reflects legal indeterminacy); see generally Lefstin, *supra* note **.

[34] Lefstin, *supra* note **, [tribunal data]. Note that while reversal is a significant contributor to the probability of dissent in an individual case, the correlation between dissent and reversal in the aggregate is less impressive. *See* Songer, Sheehan and Haire , *supra* note **.

[35] Lefstin, *supra* note **.

[36] Id.

exceptional because such reversals are not accompanied by a corresponding elevation in dissent frequencies at the Federal Circuit. Accepting the truth of all the empirical studies, what we must explain is why claim construction issues are characterized by a discrepancy between reversal rates and dissent rates that is *not* observed for other issues.[37] Legal indeterminacy, which should influence both reversal and dissent rates, cannot by itself account for this discrepancy.[38]

Likewise, the lack of deference accorded to trial court claim constructions by the Federal Circuit, though increasing the frequency of reversals, is insufficient to explain why claim construction should provoke more reversals without a corresponding increase in dissent. Suppose an exceedingly deferential standard of review: the appellate court could not reverse unless it was convinced the trial judge was insane. Certainly few reversals would result. But there would be few dissents either. Presumably, most appellate judges would agree with each other on the question of whether the trial judge was insane or not. Likewise, suppose the appellate court was entirely unconstrained, free to rule according to the personal viewpoints of the appellate judges. Discrepancies between the personal viewpoints of the trial and appellate judges would yield numerous reversals, but so too discrepancies between the personal viewpoints of the appellate judges ought to yield numerous dissents.[39] Moreover, while the question has not been studied directly, the available empirical data do not support the hypothesis that the rate of district court reversals is correlated with the standard of appellate review. After claim

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[37] If we compare the reversal rates reported by Moore, *supra* note **, (2001) to the dissent rates reported by Lefstin, *supra* note **, (2007), the following ratios of reversals to dissents result: Claim construction, 4.0:1, infringement, 2.7:1; invalidity, 2.9:1; inequitable conduct, 2.8:1. Differences in methodology and time frame of these studies make this comparison not particularly accurate, and with a small number of comparisons it is entirely possible that the similarity of infringement, invalidity, and inequitable conduct is coincidental. Nonetheless, the close correspondence of the issues other than claim construction seems remarkable, especially since decisions on claim scope must correlate to some degree with decisions on claim infringement, validity, or enforceability.

[38] One could also seek to account for the discrepancy between claim construction and other issues by asking not why reversals are high, but why dissents are low. If appellate judges preferentially suppress dissent on claim construction issues, then the ratio of reversals to dissent increases. If Federal Circuit judges suppress internal dissent on interpretation questions, then claim construction really is indeterminate , as indicated by the elevated district court reversal rates. This scenario seems unlikely. Empirically, the relative rates of reversal and dissent for the Federal Circuit do not seem to differ from that of other appellate courts, *see* Lefstin, *supra* note **, (2007) note 149, (showing that measured ratio of reversal to dissent for the Federal Circuit corresponds with that reported for the other Circuit Courts of Appeal). More importantly, it seems difficult to conceive of why the Federal Circuit would suppress internal disagreement about claim construction more than it would suppress internal disagreement about other patent issues.

[39] This argument assumes sufficient legal indeterminacy to permit trial and appellate judges to disagree with each other about what the outcome of the case ought to be.

construction, the issue on which district courts were reversed most frequently in Moore's study was unenforceability.[40] Unenforceability determinations, be they questions of inequitable conduct, laches, or equitable estoppel,[41] are reviewed under an abuse of discretion standard.[42] If the standard of review alone could explain reversal rates, then enforceability determinations ought to be subject to fewer reversals than other issues, not more.

If neither legal indeterminacy nor the standard of review can explain the discrepancy between reversal rates and dissent rates in claim construction, what can? Having just belittled an excessive focus on the internal operation of the judicial system, it would be difficult to assert that the question is interesting in its own right. Rather, I hope to show in the following sections that the question is significant because the *ex ante* predictability of claim construction - and what we might do to promote that predictability - depends strongly on the explanation for the observed discrepancies between inter-court and intra-court disagreement rates.

B. Characteristics of the decision-makers

A priori, a systematic discrepancy between case outcomes at different courts must be rooted in one of two causes: either differences between the decision-makers of the

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[40] *See* Moore, 99 MICH L. REV. 365 at 399. One might ask whether the difference in reversal between unenforceability and other issues - or, for that matter between claim construction and other issues - is significant. Moore in another study states that because all cases in the relevant population were scored, the results are by definition statistically significant. Moore, 15 HARV. J. L. & TECH. at 9 n. 37. It is true that the hypothesis that reversal rates differ by issue is established by Moore's data without the need for further statistical tests. However, that hypothesis alone is of little interest. What *is* of interest is whether these differences reflect any systematic discrepancy between trial and appeal processes - that is, whether the observed differences in reversal frequencies indicate that the *probability of reversal* is significantly different on different issues. To decide whether the observed differences in reversal rates support the hypothesis that the probability of reversal is different for different issues, or whether the observed differences might simply arise by chance, does require statistical analysis.

[41] Moore does not report the reversal rate by category but included these issues in the category of unenforceability. Moore, 99 MICH. L. REV. 365 n. 105.

[42] *See* Kingsdown Medical Consultants, Ltd. v. Hollister Inc., 863 F.2d 867, 876 (en banc in relevant part) ("As an equitable issue, inequitable conduct is committed to the discretion of the trial court and is reviewed by this court under an abuse of discretion standard."); *Aukerman*, 960 F.2d 1020, 1028 (Fed. Cir. 1992) (en banc) ("As equitable defenses, laches and equitable estoppel are matters committed to the sound discretion of the trial judge and the trial judge's decision is reviewed by this court under the abuse of discretion standard."). Underlying factual determinations in enforceability questions are reviewed for clear error. *Kingsdown*, 863 F.2d at 876-77.

court, or differences in the process by which judgments are reached at each court. [43] Let us first consider differences between the decision-makers, trial and appellate judges. The simplest explanation for why Federal Circuit judges agree with each other more frequently than they agree with district court judges when deciding issues of claim construction, is that Federal Circuit judges are "better" at construing claims than district judges. According to this account, the appellate judges are more likely than the district judge to perceive the objectively "correct" claim construction. If the appellate judges are more likely to perceive an objectively correct interpretation of claims, their interpretations will tend to coincide with each others' more frequently than they will coincide with that of the trial judge.

For those seeking stability or predictability in claim interpretation, this explanation for the divergence of reversal and dissent rates is ultimately comforting. Unless Federal Circuit judges are blessed with exceptional innate talent, their superior skill in claim construction must come from experience. Few of the judges of the Federal Circuit have had extensive experience in patent law prior to their appointment. It follows that anyone with equal capacity could be as accurate as the appellate judges, if they devoted as much of their time wrestling with the interpretation of patent claims as Federal Circuit judges do. To achieve predictability all the practitioner needs is experience. To achieve stability, district courts need more experience too - perhaps specialized patent courts, frequently proposed as a remedy for district court unfamiliarity with patent cases, would cure the problem.

While comforting, and likely true in measure, this explanation is not entirely convincing. Studies comparing reversal rates between district courts that hear many patent cases, and those that hear few, have not shown that active district courts are affirmed on claim construction issues significantly more frequently than their less active brethren.[44] Nor do the district courts compare unfavorably to existing specialized tribunals. I have shown previously that, taking the ratio of reversals to dissents as a measure of tribunal 'competency', the district courts in patent cases fare equally well, or better, than specialized tribunals such as the Boards of Contract Appeals, the Court of

[43] "Process" as used here includes the actions of the parties before each tribunal, and discrepancies in other inputs to the decision-making process.
[44] Chu, *supra* note ** at 1125-26.

Appeals for Veterans Claims, or the Court of Federal Claims.[45] Moreover, attributing the high rate of reversal to inexperience of the district courts does not account for why claim construction should pose particular problems vis-à-vis other aspects of patent law. If we seek to explain why claim construction provokes more reversals than other patent issues, we would have to postulate some advantage in the Federal Circuit's experience that increases its relative accuracy on claim construction, but not on other matters of patent law.

One might argue that technological expertise provides such an advantage: while the technical details of the underlying invention potentially impinge on any issue resolved in patent infringement litigation, they do so very frequently in disputes over claim construction.[46] Yet, the details of the invention critical to claim construction are not necessarily technologically complex.[47] Moreover, the importance of experience in claim construction may diminish as the claim construction inquiry becomes more dependent on the technical details of the invention. Each patent is evaluated largely *sui generis*, according to the language used by the inventor and those skilled in the field of the invention,[48] and the patent document itself is said to be the best lexicon for establishing the meaning of its claims.[49] Case law defines a few general, non-technological words and structures employed in patent claims, but judicial experience cannot shed light on the meaning of a particular word in an individual patent claim the same way that it might shed light on contract terms ubiquitous in particular industries like insurance or real estate.

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[45] *See* Lefstin, *supra* note **, at **. Taking the ratio of reversals to dissents normalizes for the effects of legal indeterminacy. As discussed in notes ** supra, indeterminate legal regimes elevate the frequencies of both reversal and dissent. Assuming that indeterminacy affects reversal and dissent rates equivalently, dividing one rate by the other eliminates the contribution of indeterminacy. The ratio that remains measures the tendency of the appellate court to disagree with the originating tribunal for reasons other than indeterminate law. 'Competency' of the lower tribunal in this context therefore indicates only that the appellate court tends to agree with the originating tribunal's judgments.

[46] While most judges of the Federal Circuit lack technological experience, they at least have access to a pool of judicial clerks who have recent training in many technological arts.

[47] For example in *Phillips* itself, the dispute was about whether partitions within walls described as "baffles" must be perpendicular to the wall, or could be at an angle. *Phillips*, 415 F.3d at 1309.

[48] Id. at 1313 ("The inventor's words that are used to describe the invention--the inventor's lexicography--must be understood and interpreted by the court as they would be understood and interpreted by a person in that field of technology.").

[49] *See, e.g.*, *Vitronics*, 90 F.3d at 1582 (describing patent specification as best source of meaning for interpreting claims).

If the relative expertise of trial and appellate decision-makers cannot account for the exceptionalism of claim interpretation, perhaps the difference between trial and appellate judges lies not in their skill construing claims per se, but in their ability to perceive the rules of claim construction. We may suppose that underlying, determinate principles of claim construction do exist, and are followed by Federal Circuit judges, but are not perceived or followed by district court judges. Following these rules, the judges of the Federal Circuit agree with each other, but district judges who do not perceive the same rules tend to be reversed. While the notion that the Federal Circuit agrees on the principles of claim construction may seem strange in light of the prominent disagreements about claim construction in the decade since *Markman*, the reader should bear in mind that most of these disagreements concern the related questions of whether claim construction is a legal or factual determination, and the deference that should be accorded to trial court claim construction on appeal. Neither of these disagreements should lead to disagreements about *outcomes* in claim construction, except to the extent that appellate judges who give more credence to district court determinations might tend to affirm even though they themselves would have construed the claim differently. [50]

It would not be surprising if Federal Circuit judges perceived underlying rules of claim construction more clearly than district judges, since the Federal Circuit judges are the ones who make the rules. On this view, the reason why claim construction differs from other issues is historical, rather than experiential: although the principles of claim construction are as determinate as other aspects of patent law, the Federal Circuit has not articulated its principles of claim construction with the same clarity found in other aspects of patent law. Perhaps the reason for the exceptionalism of claim construction is that, unlike other principles of patent law rooted in statute or other sources, the substantive law of claim construction is almost entirely a creature of Federal Circuit precedent. Principles embedded solely in the Federal Circuit's jurisprudence may be more difficult for outside observers to perceive, relative to principles set forth by patent

[50] In light of the conflict over the factual character of claim construction and the standard of review, the excess of reversals relative to dissents on claim construction issues is even more curious than it first appears. Disagreements about the nature of appellate review ought to yield more dissents at the appellate level, but not more reversals of the trial courts. And if the minority of Federal Circuit judges who advocate more deference to the district courts actually accord that deference *sub rosa* when deciding cases, the rate of reversals ought to be further depressed.

statute or other sources.[51]s, or in Supreme Court opinions and other historical sources. But regardless of how claim construction came to be more obscure, this explanation for the divergence of claim construction from other aspects of patent law is also comforting in the end. Determinate principles of claim construction do exist, meaning that sufficiently informed observers can predict and agree upon the interpretation of a patent claim. To promote stability and predictability, the Federal Circuit simply needs to do better at articulating the principles of claim construction that guide its decisions. Alternatively, practitioners, commentators, and trial court judges need to do better at recognizing and explicating the principles that underlie the Federal Circuit's decisions.

C. Interpretive processes: Information content and information order

Up to this point the possibilities I have explored are fairly conventional and lead to conventional solutions for improving predictability of claim construction. But there is another explanation for why the views of trial courts and appellate courts fail to converge on questions of claim interpretation. This explanation depends not on differences between trial judges and appellate judges, but rather on differences between the trial and appellate processes. It is commonly assumed, usually implicitly, that trial judges and appellate judges decide the same case. They do not. Trial judges and appellate judges base their decisions on different sets of information, and the processes by which they acquire that information diverge even more than the sets of information themselves. The combination of these effects may hold serious implications for any attempt to bring predictability or stability to the process of claim construction.

1. Information set and contextual effects

Each stage of a litigated case - from its antecedent basis in the extra-judicial world, through its final resolution on appeal – may entail the loss or transformation of information present in the earlier stage. Not all facts present in the real world are uncovered in discovery; not all evidence revealed in discovery is introduced at trial, and not all evidence or argumentation introduced at trial is considered on appeal.[52] Therefore, the set of information considered by appellate judges diverges from that considered by trial judges. In some contexts, we are already familiar with the idea that trial judges and

[51] E.g., controlling Supreme Court opinions and well-recognized historical tradition.
[52] *See* Steven Hartwell, *Legal Processes and Hierarchical Tangles,* 8 CLINICAL L. REV. 315, 338 (2002).

appellate judges have access to different sets of information. For example, the deferential standard of review accorded witness credibility determinations reflects the view that participants at the trial had access to more information - namely, witness demeanor - than the appellate court could glean from the written record. But the interpretation of patent claims rarely turns on witness credibility. How could the information available to a trial judge differ from that considered by appellate judges in interpreting a written document like patent claim?

Consider the set of information a judge or other actor might employ to construe the claims of a patent. First, the information intrinsic to the patent itself - the language of the claims, the contents of the patent's disclosure, and the record of the patent's prosecution before the Patent and Trademark Office.[53] Second, formal extrinsic evidence offered at or before a trial - typically expert testimony about how artisans skilled in the field of the invention would understand the language in dispute. Third, informal "extrinsic evidence" particular to the judge in question - the sum of the interpreter's prior linguistic experience,[54] as well any sources of meaning consulted by the interpreter outside the formal record. Fourth, information conveyed to the interpreter by the attorneys litigating the case, in the form of briefs or oral argument.

The first set of information, the intrinsic record particular to the patent, is shared equally by trial and appellate judges and should not account for systematic divergences between them. However, with respect to the second set, formal extrinsic evidence, the role of the trial and appellate judge is quite different. The trial judge shapes the record. He or she decides which extrinsic evidence is admissible and which is not. Two possible consequences follow from this unique role of the trial judge. Most obviously, the trial judge may be exposed to extrinsic evidence absent from the appellate record. In the course of deciding whether to admit evidence, the trial judge examines that evidence. Though the evidence may be denied admission, the trial judge's exposure to it may influence his or her understanding of the language of the claims. Less obviously, the very act of defining the record may shape the judge's linguistic perspective irrespective of

[53] It is conventional in patent law to refer to the written record of the negotiations between the patent applicant and the patent examiner, the prosecution history, as "intrinsic evidence," although such material might be considered extrinsic in contract or statutory interpretation. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (describing prosecution history as "intrinsic evidence.")

[54] *See* Pacific Gas & Elec. Co. v. G. W. Thomas Drayage & Rigging Co., 69 Cal. 2d 33, 36-37 (1968) (describing role of judge's prior linguistic experience as source of meaning).

the content. Readers who teach first-year law students have almost certainly been asked whether a particular case or a piece of doctrine should be included in the student's outline. One response is to tell the student that it does not matter whether they include it in their outlines. What matters, for purposes of learning the law, is that they have struggled with the question of whether to include it in their outline. The trial judge's linguistic worldview may as well be altered by the process of deciding which evidence ought to be admitted or excluded at trial, and this experience is not shared with other interpreters like appellate judges.

The third set of information - linguistic experience accumulated by the judge over his or her life, and any information the judge might obtain independently - will vary from judge to judge. But there is no reason to expect appellate judges would be more similar to each other than to district judges in this respect.[55] It is true that the communal character of appellate judging may lead to convergence between appellate judges in the third set of information. Appellate judges might share with each other any extra-record information they uncover, and if such information is decisive it would promote greater accord between appellate judges than between the appellate panel and the trial judge. But neither the sharing of new information, nor any other mechanism by which the judges of a collegial court might reach accord, seems unique to interpretation problems. Nevertheless, it is noteworthy that the Federal Circuit has reserved for itself (as well as trial judges) the right to consult dictionaries in the course of claim construction, whether or not such evidence has been introduced into the record.[56] In this respect, the court has deliberately chosen not to limit the set of extra-record linguistic information available for claim interpretation.

The last set of information - the arguments presented by the parties - has the most potential to vary between trial and appeal. The set of issues argued on appeal is usually a subset of those argued at trial, meaning that the trial judge's thinking may be influenced by issues the appellate judges never see. Even for those issues which are common to trial and appeal, advocates may advance more (or less) persuasive arguments on appeal than

[55] Likewise, there is no reason to expect that variation in linguistic experience between judges exceeds variation in other characteristics, such as policy preferences. Therefore, variations in linguistic experience would not explain why interpretation might provoke more (or less) disagreement than other legal issues.

[56] *Phillips*, 415 F.3d at 1322-23 ("[J]udges are free to consult dictionaries and technical treatises at any time in order to better understand the underlying technology and may also rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents.").

they did at trial, leading to a divergence between trial and appellate courts even when the set of facts and issues considered by the courts is identical. Yet such divergence may arise in any appeal, on any legal issue. How could it account for a peculiarly salient divergence between trial and appellate courts on claim interpretation issues? One possibility is that interpretive questions in general are particularly susceptible to argumentative context. While there has been little comparison between the psychology of interpretation and other cognitive processes, experimental studies show that the depth of semantic processing in sentence recognition - the extent to which the interpreter actually analyzes the meaning of word - depends on the fit between the word and the surrounding narrative context.[57] At least under experimental conditions, pragmatic processing in sentence context can completely override the actual core lexical meaning of a word.[58] It is possible, therefore, that interpretation is innately more susceptible to context effects than other cognitive processes. But whether these effects -- observed in real-time sentence processing -- would persist in a sustained and reflective process, such as legal interpretation, remains unknown.

Regardless of the precise cognitive relationship between argument and semantics, claim interpretation may be particularly susceptible to a shift in argumentation because it underlies so many other issues in patent litigation. Infringement, novelty, non-obviousness, adequate disclosure, enforceability, inventorship - all these, and more, may depend on how the patent's claims are construed. Claim interpretation is therefore consequentialist: whether or not the black-letter law insists that claims must be construed independently of other legal issues surrounding the patent, it is not unreasonable to expect that judges test the soundness of their interpretations by considering what outcomes follow, just as all lawyers test the soundness of a rule by considering the outcomes it would dictate upon real or hypothetical facts. The Federal Circuit itself, in criticizing the current tendency of parties to stipulate to infringement or non-infringement to obtain early review of the trial court's claim construction,[59] has acknowledged that

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[57] Anthony J. Sanford, *Context, Attention and Depth of Processing During Interpretation*, MIND & LANGUAGE 17: 188, 198 (2002).

[58] Id. at 193

[59] The Federal Circuit does not grant interlocutory appeals on the question claim construction, preferring to wait until the district court issues a final judgment of infringement or non-infringement based on that claim construction. In response, litigants have begun stipulating to summary judgment of infringement or non-infringement and appealing that judgment to the Federal Circuit. *See* Wilson Sporting Goods Co. v. Hillerich & Bradsby Co., 442 F.3d 1322, 1326-27 (Fed. Cir. 2006); Massachusetts Institute of Technology

questions of claim construction are deeply embedded in the context of other issues arising in patent litigation - perhaps so deeply that they cannot be meaningfully addressed without reference to that context.[60] It follows that a judge's view on claim interpretation may be influenced not only by a shift in argument on claim interpretation itself, but also by a shift in argumentation on any number of issues that are presented in the appeal of a patent case.[61] Claim construction may be inherently more unstable between trial and appeal because, as compared to other issues which can be resolved discretely, there are many more opportunities for divergences between the information sets presented at trial and at appeal to affect the outcome of claim construction.

2. Order effects and the path dependence of interpretation

However, the difference between trial and appeal significant for claim construction disputes may lie not in the set of information considered by the trial and appellate judges. It may lie instead in the *process* by which the trial and appellate judges receive that information. Trial judges receive information over an extended period of time. The district judge may be exposed to new facts, law, and argumentation over several years as a case proceeds from pleading to post-verdict motions. The kind of information and argument presented to the trial court changes as the case evolves. The exposure typically will be intermittent. Full trials of patent cases frequently take several years, during which time the judge's concentration on claim interpretation will be punctuated by many other matters pressing on the court's docket.

Within that time lies significant potential for variation. The Federal Circuit has not constrained district courts to follow a particular procedure for construing claims. Included in this freedom is the discretion to construe the claims at any point prior to the submission of the case to a jury. Some courts construe claims as early as possible, during

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and Electronics For Imaging, Inc. v. Abacus Software, 462 F.3d 1344, 1350-51 (Fed. Cir. 2006) (noting increasing practice of stipulated judgments based on claim construction).

[60] *See* Lava Trading, Inc. v. Sonic Trading Management, LLC, 445 F.3d 1348, 1350 (Fed. Cir. 2006) ("Without knowledge of the accused products, this court cannot assess the accuracy of the infringement judgment under review and lacks a proper context for an accurate claim construction.") Despite the principle that claim scope should not depend on the accused subject matter, the Federal Circuit's concern is not misplaced. Aside from the argument that claims should be construed to preserve their validity in light of the invalidity arguments advanced by the accused infringer at trial, the resolution with which claim limitations must be construed, or whether they need be construed at all, depends on the question of infringement particular to the case. By analogy, in a property dispute between two neighbors, the boundary line between them may be defined and examined in great detail, but other boundaries of the property receive no attention because they are not in dispute.

[61] *See, e.g.,* Neomagic Corp. v. Trident Microsystems, Inc., 287 F.3d 1062, 1069 (Fed. Cir. 2002) (noting that judge's claim construction may change as parties modify their infringement arguments).

or before discovery or even in a preliminary injunction hearing; some in the context of summary judgment; others not until the jury is being instructed on the questions of infringement or invalidity.[62] Obviously, the set of information available to the district judge changes as trial develops. Judges who construe claims early may, on occasion, modify their initial claim constructions in light of additional evidence, argument, or understanding accumulated during trial.[63] Such shifts demonstrate conclusively that the interpretation of patent claims is sensitive to the linguistic framework that progressively evolves over the course of litigation.

We might well ask at this point: if judges are free to modify their claim constructions as trial proceeds, will not all claim construction processes converge on a common meaning in the end, regardless of when the claims are first construed? They will not. Claim constructions arising from different processes will diverge, even if the final set of linguistic information is the same, because the order in which information is received may change the outcome of the interpretive process. The process by which information is received by a decision-maker may change the outcome of the decision, no less than the process by which ingredients are added may change outcomes in cooking or chemistry. A rich literature in experimental psychology documents the influence of information process on outcome in medical, legal, military, political, and other contexts.[64] Specifically, three effects are of interest here: (1) the order in which observers receive evidence or arguments influences their final decision;[65] (2) where decision-making requires observers to evaluate multiple pieces of evidence, outcomes depend on whether observers evaluate information step-by-step, as each new piece of information is received, or whether they evaluate information end-of-sequence, after all pieces of

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[62] *See* note 98, *infra*.

[63] *See, e.g.*, *Neomagic,* 287 F.3d at 1069 ("As the district court's understanding of the technology evolved, and as the parties fine-turned their infringement arguments, the court periodically modified the original construction of the disputed terms."); Jack Guttman, Inc. v. Kopykake Enter., 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.").

[64] Chapman, G. B., Bergus, G. R., Elstein, A. S. (1996). *Order of Information Affects Clinical Judgment*, 9 JOURNAL OF BEHAVIORAL DECISION MAKING 201-11 (1996). Schadewald, M. S. & Limberg, S. T. (1992). *Effect of Information Order and Accountability on Causal Judgments in a Legal Context*, 71 PSYCHOLOGICAL REPORTS 619-625 (1992). Aldeman, L & Bresnick, T., *Examining the Effect of Information Sequence on Patriot Air Defense Officers' Judgments*, 53 ORGANIZATIONAL BEHAVIOR AND HUMAN DECISION PROCESSES 204-28 (1992). Hogarth, R. M. & Einhorn, H. J., *Order Effects in Belief Updating: The Belief-Adjustment Model*, 24 COGNITIVE PSYCHOLOGY 1-55 (1992).

[65] Davis, J. H. (1984). *Order in the Courtroom*, PSYCHOLOGY AND LAW, New York, NY: John Wiley & Sons Ltd.

information have been received;[66] and (3) the effect of information order is modulated by holding the decision-maker accountable for personal judgments.[67] These effects are observed not only when naïve observers are subjected to artificial experimental manipulations, but also when experts - such as experienced physicians and military personnel - make decisions in naturalistic settings.[68]

Could order affects lead to systematic divergence between trial and appellate outcomes in claim construction? Consider first the nature of the trial and appellate processes. The trial judge accumulates information sequentially, dependent on the judge's trial management decisions and the litigants' tactical choices. The appellate perspective is retrospective, with all aspects of the case being laid forth at once. Appellate judges receive, at a single point in time, the arguments of both parties presented in their appellate briefs, and those portions of the trial record that the parties include in their appendix.[69] All of the intrinsic and extrinsic evidence is presented to them at the same time, as are the final and refined arguments of the parties on claim construction and on other issues whose resolution depends on claim construction.[70] Those arguments are repeated and elaborated to all the appellate judges simultaneously during a single oral argument.

The distinction between sequential and simultaneous presentation is highly significant in light of studies showing that information order affects how decision-makers form and revise beliefs. According to the dominant psychological model of belief processing, new information received sequentially is processed by adjusting a current opinion, or "anchor," in light of the additional information.[71] Primacy and recency effects of information order arise because earlier or later information may be overweighted relative to other information, although the circumstances which give rise to primacy

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[66] Hogarth & Einhorn, *supra* note **.
[67] Schadewald & Limberg, *supra* note **.
[68] *See* Chapman, Bergus, Elstein, *supra* note ** (clinical physicians diagnosing cancer based on case histories); Aldeman, Tolcott & Bresnick *supra* note ** (air-defense officers classifying radar targets as friend or foe in air-defense simulations).
[69] *See, e.g.*, Federal Circuit Internal Operating Procedure #3 (describing distribution of briefs, record, and files to merits panels); Federal Circuit Rule 30 (specifying content of briefs and appendices).
[70] The trial judge may be likened to a referee who makes decisions in real-time as he trots up and down the field with the players; the appellate judges to one who reviews tapes taken from a vantage point high above.
[71] Hogarth & Einhorn, *supra* note **, at 8.

versus recency effects are not well understood.[72] Regardless of whether primacy or recency effects predominate, the differential weighting of information according to the timing of its presentation has clear implications for the problem of claim construction. The interpretations reached by the trial and appellate courts may differ because the trial and appellate interpretive processes receive information in quite different modes and orders.

Beyond primacy and recency effects, the more compact presentation made to appellate judges, as compared to the sequential presentation of information to the trial judge, might favor a step-by-step evaluation by the district judge, and an end-of-sequence evaluation by the appellate judges.[73] This shift in response mode further increases the likelihood that divergent claim constructions will emerge between trial and appeal. And of course, district judges are far more personally accountable for their judgments than appellate judges are. Not only is the district judge's decision is far more likely to be reviewed on appeal, but the district judge must grapple with the consequences of her decisions as trial unfolds, and cannot hide behind the relative anonymity of a panel decision. At least under experimental conditions, personal accountability can modulate the effect of information order on legal judgments,[74] leading to yet more possibilities for cognitive discrepancies in claim construction processes.

But these order and process effects may influence all kinds of legal determinations, not just interpretive ones.[75] Why might they be particularly influential on interpretive regimes? Interpretive questions, and claim interpretation in particular, may be more susceptible to order effects based on the particular cognitive processes at work.[76] Legal interpretation, though frequently requiring close attention to written context or expert testimony, is ultimately a question of language and meaning. The process of attaching meaning to a word, or associating a physical structure with a word, may well be cognitively deeper and more primitive than the more abstract determinations demanded

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[72] *See, e.g.*, Adelman et al. , *supra* note **, at 258. (finding overweighting of earlier information in contradiction to recency effect predicted by Hogarth-Einhorn model).
[73] A step-by-step or end-of-sequence response mode does not necessarily correlate with a step-by-step or end-of sequence cognitive process. See Hogarth & Einhorn, *supra* note **, at 12-14.
[74] Schadewald & Limberg, *supra* note **, at 619-20.
[75] *See, e.g.,* id. at 620 (investigating order and accountability effects on experimental tax law scenarios).
[76] Experimental comparisons between interpretation and other cognitive processes are lacking.

by patent law.[77] If interpretation questions require more primitive and less analytical cognitive processes than other legal determinations, then questions of meaning may be more sensitive to the effects of information order and evaluation mode than other legal judgments. Experimentally, cognitive psychologists have shown that a subject's interpretation of vague or ambiguous language in a survey question may be manipulated by changing either the content of previous survey questions, or simply by changing the grouping of the questions in the survey instrument.[78] If interpretation is susceptible to semantic and pragmatic context, then both the content of the surrounding legal dispute, and the order in which that content is presented or adjudicated, will influence the outcomes of interpretive regimes.

Patent claim construction may be unusually susceptible to order effects even when compared to other interpretive regimes. I have already discussed why, claim interpretation being so deeply embedded in other issues arising in patent litigation, the content of claim construction arguments will vary between trial and appeal to a greater degree than it will for other issues.[79] But the foundational nature of claim construction has consequences for order effects as well, particularly when district courts construe claims early in the trial. Claims define the boundaries of the patent. Once the claims are construed, subsequent arguments about patent infringement and patent invalidity are framed in terms of those boundaries. This framing poses two barriers, one psychic and one practical, to revising claim interpretations in light of later-arriving information. The psychic barrier is simply that, having thought very hard about whether "the patent" is infringed, invalid, or enforceable, it may well be difficult to discard an initial conception of what "the patent" is. The practical barrier, from the judge's point of view, is that much

[77] Consider, for example the difference in evaluating claim construction questions like "Does the term 'member' include structures of more than one piece?" (*CCS Fitness*) with invalidity inquires like "Would one of ordinary skill in the art be able to make and use the subject matter of claim 5 without undue experimentation?" It is true that claim interpretation also formally proceeds from the perspective of one skilled in the art (*Phillips*), but in questions of word meaning or sentence syntax the inquiry frequently must rely on ordinary linguistic principles.

[78] Fritz Strack, Norbert Schwarz, and Michaela Wänke, *Semantic and Pragmatics Aspects of Context Effects in Social and Psychological Research*, 9 SOCIAL COGNITION 111, 119 (1991) (showing effect of preceding questions); id. at 122 (showing effect of grouping). Strack et al. suggest that context effects may be particularly strong in asocial, or non-interactive communicative contexts, in which the respondent must rely on static sources of meaning, rather than engage the contributor in a dynamic dialogue. Id. at 112-13. Legal interpretation generally requires extracting meaning from a static text or texts, and claim interpretation is even more asocial than other legal interpretation, because - unlike statutory or contract interpretation - intent of the drafter is of limited significance. Consequently, legal interpretation may be more sensitive to context and order than more dynamic and interactive modes of legal thinking.

[79] See text accompanying notes ** above.

of the litigation has already been conducted under the initial definition of claim scope. Certain paths of discovery have already been permitted or forbidden, and not only particular arguments but entire legal issues may be present or absent from the trial based on the initial construction of the claims. To revise the interpretation of the claims based on information that emerges as trial proceeds, the judge must be willing to impose significant costs in time and money upon all the participants - litigants, jurors, and the judge himself. While judges do on occasion revise claims mid-stream, [80] it requires little imagination to see that linguistic information received subsequent to the initial claim construction may be discounted relative to that received prior.

The circumstances that promote differential weighting of earlier and later information are not present on appeal. Appellate judges receive all the information relevant to claim construction essentially simultaneously, and therefore choosing between competing claim constructions does not entail changing the mental frame of reference under which issues of infringement or invalidity have already been considered. Appellate judges may, in marginal cases, be motivated by concerns of judicial efficiency to preserve the ruling of the district court rather than remand the case. But reversal is essentially costless to the appellate judge,[81] and the appellate panel's relationship with the litigants is typically over by the time it issues its decision. The absence of psychological barriers or administrative costs means that, even given the same set of information, appellate judges will weight constituents of the information set differently than participants in a trial do.

III. THE CONVERGENCE OF PERSPECTIVE AND THE PATH TO PREDICTABILITY

All this is by way of saying that the interpretation of patent claims is path-dependent. The meaning assigned to claims is the product not only of the particular and unique set of information articulated during litigation, but of the particular and unique sequence with which that information was presented to the decision-maker. The appellate judges may differ in innate linguistic outlook from each other, and from the trial judge, but the overriding influence shaping their interpretation is the common vantage point they share with each other, and do not share with the trial judge or with the

[80] See note ** above
[81] Except to the extent that summary affirmances spare the appellate judges the cost of writing an opinion.

participants at trial. That common perspective leads to a coincidence of judgment on claim construction with each other and a divergence of judgment from the trial judge. The result is the observed excess of reversal in comparison to the incidence of dissent.

Whether the trial or appellate perspective is ultimately more accurate in ascertaining the interpretation of claims is not a question I will attempt to answer, one reason being the lack of a rigorous answer to the question of what "accurate" claim construction means. But if this explanation for the apparent frequency of reversals in claim construction is correct, the implications for the adjudication of patent disputes are profound. "Better" - more educated, or more specialized - trial judges would not greatly improve the consistency of claim construction, because it is discrepancy between trial and appellate processes, not discrepancy between trial and appellate judges, that accounts for reversal rates.[82] Nor would a more deferential standard of review improve matters. Fixing the district court's claim construction would, of course, increase stability in the interval between trial and appeal - though possibly at the expense of accuracy if we believe the appellate process provides the more accurate interpretation.[83] But it would not yield pre-litigation reckonability, because the district judge's claim construction is the result of the unique and idiosyncratic evolution of the interpretive process over the course of a particular litigation. It may well be that pre-litigation predictability would actually *decrease* under a more deferential standard of review. It would seem far easier for the practitioner to assume *ex ante* the coincident perspective of the appellate judge, than it would be to assume the sequential perspective of the trial judge. And, like the appellate judge, the practitioner *ex ante* may evaluate and revise claim constructions without significant costs.[84] If it is easier to replicate the appellate interpretation process than it is

[82] Certainly we could expect some improvements with specialized judges; but it is noteworthy that in some experimental contexts, training the observers in the overall task and the evaluation of pieces of evidence did not significantly modulate the effect of information order. See Tubbs et al., *Order Effects in Belief Updating with Consistent and Inconsistent Evidence*, 6 J. OF BEHAVIORAL DECISION MAKING 257, 263, 267 (1993). Tubbs et al. therefore suggest that information order effects arise from the process of integrating new information into the existing information set, rather than evaluating the individual piece of information. Id. at 267-68

[83] *See* Moore, 15 HARV. J. L & TECH. at 27-31 (suggesting that appellate claim interpretations are more accurate).

[84] The client footing the bill may beg to differ.

to replicate the trial interpretation process, then more deference to trial courts equates to less ultimate predictability.[85]

If differences between information sets and information order account for the discrepancy between trial and appellate claim construction, then the means to achieve stability and predictability - whether in anticipation of, during, or after trial - seem clear. If we are concerned primarily about predictability and consistency between trial and appeal, then claim construction ought to be conducted late in the litigation process. To maximize the information available to the district judge, to ensure that interpretation is not discouraged by pre-existing frames of reference or effort already sunk into litigation, and to make the trial perspective correspond most closely to the appellate perspective, claims ought to be construed as late in the litigation process as possible. Quite apart from the concern of reversal on appeal, some district judges have expressed a preference for construing claims late in the trial, citing the need to interpret claims in the context of the litigated issues and the possibility that information elucidated during trial may shed light on the meaning of the claims.[86] Their preference confirms that information timing and order affect their claim construction decisions. Consequently, maximum predictability would likely to be achieved by delaying claim construction as long as feasible.[87]

This prescription is not followed in most patent infringement trials,[88]and will be unpalatable to many patentees and practitioners.[89] Defining the scope of the patent early

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[85] There are counterarguments, namely that the appellate panel sees a more restricted set of information - information accepted at trial and preserved in the appellate process - than the set of information initially seen by the district judge. See Hartwell, supra note ** (describing narrowing of information set at each stage of litigation). It may be easier to predict the set of information seen by the trial judge than to predict the set of information seen by the appellate judge, even if appellate order effects are easier to predict.

[86] Comments of Walker, Chief Judge, and Alsup, District Judge, of the Northern District of California, made to the San Francisco Bay Area Intellectual Property Inn of Court, January 17, 2007. *See also* Thomson Consumer Electronics, Inc. v. Innovatron, S.A., 43 F.Supp.2d 26, 28-29 (D.D.C. 1999) (noting that claim construction without infringement or validity context requires court to render "blind justice" and borders on advisory opinion).

[87] A prediction of this model is that district courts construing claims late in the trial ought to be reversed by the Federal Circuit less frequently than district courts construing claims early. This prediction merits empirical testing.

[88] A 2002 survey of practitioners by the ABA Intellectual Property Law Section reported that claims were construed after trial began in just 6% of cases. See Committee No. 601 - Federal Trial Practice and Procedure, ABA Intellectual Prop. Law Section, 2002-2003 Annual Report, <http://www.abanet.org/intelprop/annualreport05/content/02-03/COMMITTEE%20NO%20601.pdf>, at 4-5 (reporting survey results). Most common (78%) was to construe the claims after discovery but before trial. Id.

[89] *See, e.g.*, William F. Lee and Anita K. Krug, *Still Adjusting to Markman: A Prescription for the Timing of Claim Construction Hearings*, 13 HARV. J. LAW & TECH. 55, 83 (1999) (arguing that construction in connection with summary judgment is optimal); John R. Lane and Christine A. Pepe, *Living Before,*

immensely simplifies nearly every succeeding step in litigation. For example, accused infringers often argue that should the claims ought to be construed narrowly, in which case the accused subject matter does not fall within, but should the claims be construed broadly, the claims do not meet the statutory standards of patent validity. Early claim construction may permit the litigants to concentrate on infringement and ignore validity, or vice versa. Claim scope may determine whether extensive discovery to investigate the details of the accused subject matter is necessary to resolve the question of infringement, or whether the patentee's personnel and legal counsel may be deposed to determine whether the patentee has disclosed its best mode of practicing the invention[90] or whether it satisfied the duty of candor while prosecuting the patent before the Patent and Trademark Office.[91] It may determine whether expert testimony concerning the state of the art is needed to determine whether the claims are non-obvious[92] or enabled.[93] Early resolution of a claim scope dispute may obviate the need to litigate these issues. Further, if the goal of the *Markman* - - *Cybor* regime was to promote the early disposition of cases by summary judgment, construing claims late in the trial may frustrate that goal.[94] Advocates of predictability in claim construction must consider whether predictability between trial and appeal is valuable enough to make such sacrifices worthwhile.

But less costly prescriptions also follow from the conclusion that claim construction reversals are caused by information effects. First, if the set of information available in claim construction strongly influences outcomes, we ought to define and circumscribe the kinds of evidence available to claim construction, and the appropriate weight to be accorded to each in the interpretive process. If all observers (judicial or otherwise) begin with approximately the same set of information, we maximize the likelihood of achieving consistent interpretations. Second, if information order and

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Through, and with Markman: Claim Construction as a Matter of Law, 1 BUFF. INTELL. PROP. L.J. 59, 70-71 (2001) (arguing for as early construction as possible); David H. Binney and Toussaint L. Myricks, *Patent Claim Interpretation After Markman - How Have the Trial Courts Adapted?*, 38 IDEA 155, 184-85 (1997) (arguing claims should be construed at close of discovery or earlier).

[90] 35 U.S.C. § 112(1)

[91] *See, e.g.*, Molins PLC v. Textron, Inc., 48 F.3d 1172, 1178 (Fed. Cir. 1995) (describing duty of candor in patent prosecution).

[92] 35 U.S.C. § 103

[93] 35 U.S.C. § 112(1)

[94] One might compromise by delaying claim construction to immediately prior to summary judgment. However, while such compromise sacrifices the possibility of streamlining discovery, it would promote reckonability only to the extent that the district judge has more context for interpretation at the summary judgment stage than she would earlier in litigation.

related effects shape interpretation, we ought to define and regularize the process by which information is received and processed in the claim construction inquiry. While no two presentations of information will coincide exactly, at least differently situated observers can follow the same path through the evidence relevant to claim construction. By so doing information order effects would be minimized.

These prescriptions seem precisely the opposite of the course chosen by the Federal Circuit, particularly in the court's recent attempt to lay down the definitive law of claim construction in *Phillips*. In *Phillips*, the Federal Circuit reaffirmed *en banc* that any evidence - the words of the claim, their context in the claim in question and in other claims, as well as "the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art"[95] - ought to be considered if relevant to construction of the claim.[96] And aside from expressing a general preference for intrinsic evidence over extrinsic evidence,[97] the court expressly declined to establish a weighting or hierarchy that would favor particular kinds of evidence over others.[98] The court therefore chose to leave the set of information available for claim interpretation, and the internal sorting of that set, largely unbounded.

The Federal Circuit has similarly declined to specify an order for the interpretative process. While *Markman* and *Cybor* entrusted claim interpretation to the district judge, the Federal Circuit leaves district judges free to construe claims by nearly any procedure, or at any point in the trial, as the district judges sees fit.[99] And although in the years leading up to *Phillips* the Federal Circuit seemed to be developing a defined order of consideration and weighting for the different forms of evidence relevant to claim construction,[100] in *Phillips* the court rejected the proposition that district courts ought to

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[95] *Phillips*, 415 F.3d at 1314 (quoting *Innova*, 381 F.3d at 1116)

[96] The court did emphasize that the underlying inquiry was narrow: the meaning of the claim is that which would be ascribed to it by one skilled in the art of the invention, in the context of the entire patent. Id. at 1313.

[97] Id. at 1317-19

[98] *See* id. at 1324 ("[W]hat matters is for the court to attach the appropriate weight to be assigned to those sources in light of the statutes and policies that inform patent law."). Cf. Uniform Commercial Code § 2-208 (setting forth hierarchy of evidence for contract interpretation).

[99] *See* Lane and Pepe, , *supra* note **, at 63-64 (noting flexibility of district court claim interpretation procedures); Binney & Myricks, supra, at 163-70 (surveying diversity of district court timings).

[100] *See, e.g.*, Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp., 320 F.3d 1339, 1346-47 (Fed. Cir. 2003) (setting forth ordered process for defining the meaning of claim term).

follow a prescribed sequence of steps or algorithm in construing claims.[101] If the outcome of the interpretive process is particularly susceptible to order effects, then the court's refusal to dictate the legal or conceptual order of the interpretive process will continue to generate discrepancies between the claim constructions reached by the district courts and those reached by the Federal Circuit itself. This lack of stability may not be as dire as many commentators fear, but the Federal Circuit's cautious course in *Phillips* seems to guarantee that, at least between trial and appeal, claim constructions will remain unstable.

I have in this essay attempted to explain the apparently anomalous incidence of reversal on claim construction issues in patent cases. But in conclusion let me suggest that claim interpretation, or patent law in general, is not the only field which requires an explanation for an elevated incidence of reversals. What we observe in claim construction, assuming the accuracy of the empirical studies, is essentially an excess of reversals over dissents. While legal regimes vary in their degree of indeterminacy, indeterminacy yields both reversals and dissents. Empirical study shows that the frequency of reversal and dissent is in fact correlated across various legal regimes supervised by the Federal Circuit.[102] More generally, reversal of a district court significantly increases the probability of dissent at the appellate level. [103] Claim construction is curious in that the available empirical data suggests an elevated rate of reversal without a significantly elevated rate of dissent. This disparity suggests that factors other than legal indeterminacy are responsible for the rate at which district courts are reversed on claim construction. I have thus sought to explain why trial courts might be reversed unusually frequently on the question of claim for reasons unrelated to the underlying substantive legal regime.

However, such reasons may be required to explain the incidence of reversal in relation to dissent for all fields of law, not just the law of claim construction. To see why, consider a very simple model of trial and appellate decision-making.[104] Assume

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[101] *Phillips*, 415 F.3d at 1324. In this respect the Federal Circuit seems to have endorsed the "holistic" approach to claim construction identified by Wagner and Petherbridge, rather than the more rule-bound "procedural" approach. *See generally* Wagner Petherbridge, , *supra* note **.

[102] *See generally* Lefstin, *supra* note **.

[103] *See* Hettinger, Lindquist and Martinek, *supra* note **, at 71 (showing statistically significant influence of reversal parameter on odds of dissent).

[104] This model is based on the one described by Gelfland and Solomon, here modified for one rather than three trial judges and three rather than seven appellate judges. *See* Alan E. Gelfland and Herbert Solomon,

that, as in the federal system, cases are decided by a trial court consisting of one judge and reviewed by an appellate court consisting of three judges. Assume that each judge reaches a "correct" or "incorrect" outcome in a case, with a certain probability of reaching the correct result. Assume further that each judge, whether trial or appellate, has an identical probability of reaching a correct or incorrect outcome. Under such conditions, it is possible to demonstrate mathematically that appellate dissents ought to outnumber trial court reversals by a ratio of between about 1.5:1 and 2:1, depending on the probability of individual error.[105] Such ratios are not observed. Studies of dissent and reversal at the United States Circuit Courts of Appeal show that, rather than dissents outnumbering reversals, reversals outnumber dissents by a ratio of somewhere between 2.5:1 and 3:1.[106] In other words, federal trial courts in the United States are reversed somewhere between 375% and 600% more frequently, relative to dissents, than they ought to be under the simple model.

A Study of Poisson's Models for Jury Verdicts in Criminal and Civil Trials, 68 J. AM. STATISTICAL ASS'N 271, 275 (1973).

[105] This ratio is derived from the formulae given by Gelfland and Solomon, as follows. If the probability of a judge reaching the correct result is given by μ, then μ also represents r, the probability of a district court reaching the correct decision. The probability of a court of three identical judges reaching the correct result is $r' = \mu^3 + 3\mu^2(1 - \mu)$. *Id.* at 275. This equation represents the probability of all three judges reaching the correct result (μ^3), plus the sum of the probabilities for the three permutations where two judges reach the correct result (μ^2) and one reaches the incorrect result ($1 - \mu$). The appellate court affirms when both courts reach the same result, correct or incorrect, and reverses when the courts reach different results. The probability of an affirmance is therefore the sum of the probability that both courts reach the correct result, and the probability that both courts reach the wrong result, $C = rr' + (1 - r)(1 - r')$. *Id.* The probability of reversal is therefore $1 - C$. Likewise, the probability of a unanimous decision by the appellate court of three identical judges is given by the relation $a = \mu^3 + (1 - \mu)^3$, i.e. all three judges reach the correct result (μ^3) or all three reach the wrong result ($(1 - \mu)^3$). The probability of a nonunanimous decision, yielding a dissent, is $1 - a$. See *id.* Calculation of the probability of dissent and reversal, and the ratio between the two, for various values of μ is shown in the following table:

μ (= r, 1 judge)	r', 3 judges	Reversal (1 - C)	Dissent (1 - a)	Dissents:Reversals
0.10	0.03	0.12	0.27	2.21
0.20	0.10	0.26	0.48	1.83
0.30	0.22	0.39	0.63	1.63
0.40	0.35	0.47	0.72	1.53
0.50	0.50	0.50	0.75	1.50
0.60	0.65	0.47	0.72	1.53
0.70	0.78	0.39	0.63	1.63
0.80	0.90	0.26	0.48	1.83
0.90	0.97	0.12	0.27	2.21

The ratio of dissents to reversals approaches 3 as μ approaches 0 or 1, but of course the number of dissents and reversals approaches 0 under such conditions.

[106] *See* Songer, Sheehan and Haire, *supra* note **. The proportion of cases reversed may be fairly constant over long periods of time, and even across different judicial systems. Poisson's studies of civil cases appealed in all judicial departments of France from 1831 to 1833 found that 11,747 cases were affirmed at 5,410 reversed, yielding a reversal rate of 31.5%. Gelfland and Solomon, *supra* note **.

We certainly may quibble with the assumptions of the simple model. Appellate judges may be more accurate than trial judges at reaching a "correct" result, in part because they have more power to set the rules of what is "correct" or not.[107] And unquestionably social and institutional pressures cause appellate judges to refrain from expressing dissent in some fraction of cases in which they nonetheless disagree with the majority's outcome.[108] Refining the simple model to account for these effects would increase the ratio of reversals to dissents, bringing the model more in line with the observed statistics. However, if we are not convinced that these two refinements could account entirely for the rather large excess of observed reversals, we must look elsewhere for an explanation. The effects I have described here – essentially, the significance of perspective in judicial decision-making – may explain why the convergence of appellate opinions, and their divergence from the opinions of trial courts, are general features of the legal system.

[107] Note, however, that the power to fashion rules of law leads to additional opportunities for dissent, in the form of disagreements about what that rule of law ought to be.

[108] *See, e.g.*, Learned Hand, THE BILL OF RIGHTS 82 (1958) (arguing that dissent threatens to cancel "the impact of monolithic solidarity on which the authority of a bench of judges so largely depends."). See also Lefstin, *supra* note **, at ** (reviewing structural judicial variables which suppress the expression of dissent)