

Bayesian Contractual Interpretation

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Abstract:

Courts seeking the most likely intent of contracting parties should interpret contracts according to Bayes' Rule. The best interpretation of a contract reflects both the prior likelihood (base rate) of a pair of contracting parties having a given intention as well as the probability that the contract would be written as it is given that intention. If the base rate of the intention associated with the simplest reading of the contract is low, then Bayes' Rule implies that the simplest reading is not necessarily the interpretation of the contract that most likely captures the parties' intentions. The Bayesian framework explains when default rules should be more or less "sticky" and helps define the appropriate role of boilerplate language in contractual interpretation.

¹ Associate Professor of Law, Yale Law School, I thank Ian Ayres, Omri Ben-Shahar (the editor), Richard Brooks, Richard Craswell, Daniel Ho, Daniel Markovits and an anonymous referee for many helpful comments and discussions. Ian Masias provided excellent research assistance. All errors are my own.

I. Introduction

When contracts present missing or ambiguous terms, contract law generally attempts to determine what the “parties meant” to say,² or “would have said if they had spoken about the matter.”³

Determining what the parties meant to say or would have said is often difficult.⁴ It is therefore no surprise that contract law consists of a multitude of doctrines, decisions, and theories concerning the appropriate way to uncover the parties’ “hypothetical” or actual bargain. Sometimes these decisions appear counterintuitive. In the celebrated case of *Jacob and Youngs v. Kent*,⁵ for example, Justice Cardozo claims to seek the parties’ “reasonable and probable” intent with regard to the piping in a house, yet appears to overlook the parties’ written insistence on Reading brand pipe specifically and instead allows an alternative pipe of equivalent quality to take Reading’s place.⁶ More generally, atypical parties have an extremely difficult time obtaining their often explicit bargain in the presence of contract law’s establishment of doctrines for recreating hypothetical bargains.⁷

This article argues that Bayes’ Rule provides a useful lens for examining how contract law recreates bargains. Nearly unmentioned in prior scholarly work on contractual gap filling and interpretation, Bayes’ Rule provides a mathematical framework explaining how a decision-maker should modify existing beliefs about a bargain between two parties in the light of the evidence provided by a written contract. The modified belief about the hypothetical bargain should equal the probability that the contract would be written as it is given a particular bargain, multiplied by the “prior” belief about the likelihood of that hypothetical bargain, divided by the total likelihood of the contract being written as it is given any true bargain.

Consider *Jacob and Youngs* from a Bayesian perspective. Suppose that there are two avenues whereby the contract language calling for Reading pipe specifically might have come about. On the one hand, the language fits naturally if the parties truly intended to have Reading Pipe specifically. Alternatively, the parties may have meant merely to use pipe of Reading quality but in-artfully drafted a contract that seems to insist on Reading Pipe specifically. It is therefore more likely that the language in the contract would have been observed if the parties desired Reading Pipe than if the parties simply desired Reading quality pipe. So the most likely hypothetical bargain would at first glance seem to be Reading Pipe specifically, though this intuition is a reflection of the base rate fallacy.

² For expressions of this sentiment spanning 200 years of U.S. History, see, e.g., *Graves & Barnewall v. Boston Marine Ins. Co.*, 6 U.S. 419, 433 (1805) (stating that “.. a policy is a contract of indemnity, and that what the parties meant at the time ought to be carried into effect”); *Harris v. The Epoch Group, L.C.*, 357 F.3d 822, 825 (8th Cir. 2004) (stating that “..this is simply a matter of straightforward contract interpretation. The only issue, therefore, is what the parties meant when they said ...”)

³ *Globe Refining Co. v. Landa Cotton Oil Co.*, 190 U.S. 540 (1903) (Holmes, J.)

⁴ Robert E. Scott & Judy S. Kraus, *Contract Law and Theory* 89 (LexisNexis, 2007) (2002).

⁵ 129 N.E. 889 (N.Y. 1921).

⁶ See 129 N.E. 889 (N.Y. 1921) (McLaughlin, J., dissenting).

⁷ Charles J. Goetz & Robert E. Scott, *The Limits of Expanded Choice: An Analysis of the Interactions Between Express and Implied Contract Terms*, 73 CAL. L. REV. 261, (1985).

Interpreting the contract to mean Reading pipe specifically because it is the most natural reading of the contract presents an instance of the “base rate fallacy”,⁸ a common cognitive bias where the decision-maker underweights the “prior” likelihood of parties wanting Reading Pipe specifically (the “base rate”) relative to the (written) evidence directly at hand. Suppose that there are many more parties in the population who prefer pipe of Reading quality rather than Reading Pipe specifically. This means that when confronted with a contract that calls for Reading Pipe specifically, it may be more likely that the contract stemmed from parties who wanted pipe of Reading quality (high prior) and drafted their contract poorly rather than from parties who wanted Reading pipe specifically (low prior) and drafted their contract well. If this is the case, then the most likely bargain between the parties is pipe of Reading quality-- in spite of the fact that the contract calls for Reading pipe specifically.

Bayes’ Rule also explains why courts may be reluctant to respect the explicit opt-out language of parties seeking to alter a default rule. Previous scholarship has critiqued this preference for default rules over explicit language as a result of judicial misunderstanding,⁹ but the preference for default rules may reflect an implicitly Bayesian approach to contract interpretation. If default rules are majoritarian, then default terms have a higher prior likelihood than alternative terms. Language seeking to switch to the alternative term must overcome the prior weighting towards the default. If the alternative term has a low prior, then it may be extremely difficult to alter default rules through explicit language. This difficulty does not stem from of any judicial misunderstanding, but rather because courts are applying Bayes Rule.

Similarly, Bayes’ Rule explains how “boilerplate” contractual language may be sometimes disregarded and sometimes observed. Language that is not read by either party provides little evidence to shift prior beliefs about the likelihood of certain intentions. As a result, prior beliefs may be given more weight in the presence of boilerplate than they would if language was specifically bargained for.

The article proceeds as follows. Section II examines the law and economics of contractual interpretation and gap filling. Section III describes Bayesian contractual interpretation and provides examples of its application to *Jacob and Youngs v. Kent* and *Peevyhouse v. Garland*. Section III also discusses how Bayes Rule should be modified when judges make errors in calculating base rates and interpreting the natural reading of the contract. Section IV applies the Bayesian contractual interpretation framework to illuminate the status of idiosyncratic parties and the devaluation of boilerplate language. Section V concludes.

II. The Law and Economics of Contractual Interpretation and Gap Filling

Law and economics scholars have devoted considerable attention to the best means of filling contractual gaps. Historically, courts aimed to provide “majoritarian” default rules or standards, filling gaps to provide what the parties would most likely have

⁸See Daniel Kahneman & Amos Tversky, *On The Psychology of Prediction*, 80 PSYCHOL. REV. 237 (1973).; Daniel Kahneman & Amos Tversky, *The Evidential Impact of Base Rates*, in Judgment Under Uncertainty: Heuristics and Biases (Daniel Kahneman, Paul Slovic, & Amos Tversky, ed., 1985).

⁹ See Goetz and Scott, *supra* note 76.

wanted had they considered an issue.¹⁰ Scholars justified this aim by explaining that it reduces transaction costs. If the state fills in gaps that the contracting pair would have wanted, then most parties will not have to undertake the expense of writing more detailed contracts.¹¹

The analysis of gap filling shares many similarities with an examination of standards of interpretation or written contracts.¹² In interpretation, as in gap filling, the traditional legal norm is to implement “what the parties meant.” In interpretation, judges simply have more information than they do when gap filling. In both cases, however, the information fails to unambiguously point to one ruling.

Despite these similarities, relatively few scholars draw an explicit link between gap filling and interpretation.¹³ Goetz and Scott explain how default rules contaminate interpretation of seemingly explicit written terms.¹⁴ Shavell examines both gap filling and interpretation in a single framework,¹⁵ but assumes that contracts either contain gaps or unambiguous writings of varying specificity; Courts are able to distinguish between these possibilities and are free to either interpret unambiguous writings as written or to choose an alternative interpretation. Moreover, Shavellian contracts contain no accidental terms or meanings. Instead, all terms derive from explicit consideration of the parties—though a court may choose to interpret a contract against the meaning of the parties.

This paper departs from the existing literature in two primary directions. First, the paper assumes that contractual gaps and ambiguities are parts of a continuum rather than different modes of analysis. A contract almost always provides some clue about what the parties might have wished in unnamed scenarios, even if the contract does not explicitly detail the actions associated with the scenario.¹⁶ Likewise, even the most specific and explicit instruction may contain ambiguity if it does not result from explicit bargaining between parties but rather represents “boilerplate”. As a result, the paper applies one uniform analysis to gap filling and interpretation, which are often treated as distinct problems.¹⁷

A second distinction between this paper and the previous literature is that this paper assumes that courts seek to ascertain and implement the contractual parties’ true

¹⁰ Scott & Kraus, *supra* note 3, at 93-95.

¹¹ For a recent summary of this explanation, along with a critical review, see Alan Schwartz & Robert E. Scott, *Contract Theory and the Limits of Contract Law*, 113 YALE L. REV. 541, 595-96 (2003). In the last twenty years, scholars have frequently articulated alternative goals for gap filling, such as the facilitation on information sharing by the contracting parties. See, e.g., Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L. J. 87 (1989); Lucian A. Bebchuk & Steven Shavell, *Information and the Scope of Liability for Breach of Contract: The Rule of Hadley v. Baxendale*, 7 J.L. ECON. & ORG. 284 (1991).

¹² Richard A. Posner, *The Law and Economics of Contract Interpretation*, 83 TEX. L. REV. 1581 (2004).

¹³ Exceptions include; Eric A. Posner, *The Parol Evidence Rule, The Plain Meaning Rule, and the Principles of Contractual Interpretation*, 146 U. PA. L. REV. 533 (1998); Goetz & Scott, *supra* note 6; Steven Shavell, *On the Writing and the Interpretation of Contracts*, 22 J.L. ECON. & ORG. 289 (2006). Alan Schwartz and Joel Watson, “Describability and Contract Interpretation” (Yale Law School Working Paper July 2009).

¹⁴ Goetz & Scott, *supra* note 6.

¹⁵ Shavell, *supra* note ~~13~~12.

¹⁶ In the default rule literature, these clues correspond to the degree of “tailoring” to use while gap filling. See Ayres & Gertner, *supra* note 13.

¹⁷ For example, one prominent Contracts casebook lists four primary functions of contract law, two of which are gap filling and interpretation. Scott & Kraus, *supra* note 3, at 2-6.

intentions. Most of the existing literature, by contrast, assumes that courts should (and do) aim to maximize social welfare.¹⁸

This emphasis on the recovery of hypothetical bargain is a conditional one. The argument is not that determining what the parties would have wanted is the correct goal of contract interpretation. Instead, the aim is to examine the implications of the hypothetical bargain approach, taking as given that the hypothetical bargain approach is the mode of interpretation. As a practical matter, many (perhaps most) courts strive to implement what the parties intended. Whatever courts reasons for preferring to interpret contract under the hypothetical bargain context,¹⁹ the fact is that they do. Papers examining contractual interpretation from a social welfare perspective may therefore have little relevance to courts with different maximands.

The hypothetical bargain approach conditionally adopted here corresponds to the social welfare maximizing approach if contracting parties are ignorant of the law and do not change their drafting behavior or the quality of their performance in response to interpretative rules. In this case, a Kaldor Hicks welfare maximizing court seeks to maximize the welfare of the parties at hand. In the absence of other information available to the court (such as information regarding changed circumstances), the hypothetical bargain of the parties represents the best evidence regarding a welfare maximizing distribution between the two parties.

III. Bayesian Contractual Interpretation

A. Combining Pieces of Evidence Regarding Contractual Intent

Consider the decision of a court interpreting a contract with two possible meanings. The court interprets the contract to actualize the parties' most likely intention, but the court is uncertain regarding which of the two possible intentions the parties actually meant or would have meant.

The court uses two pieces of evidence to interpret the disputed term. First, the court reads the written contract itself. The written terms may be more likely to result from one intent or another. Thus, the written contract provides evidence about the true intent of the parties.

The second piece of evidence available to the court is the court's background knowledge of the prior likelihood (the base rate) that any pair of contracting parties have one possible intent relative to the other possible intent. This evidence depends on the court's existing knowledge and is independent of the written contract.

Bayes' Rule describes how a court should combine these two pieces of evidence to arrive at the most likely intent of the parties. The court should multiply the probability that the written contract would be written the way it is, given that the parties desired the

¹⁸ An exception to this trend is Posner, *supra* note 15, which also assumes that courts are seeking to give the parties what they wanted.

¹⁹ A detailed examination of why courts interpret contracts to give the parties what they wanted is beyond the scope of this paper. The hypothetical bargain context makes most sense under a corrective justice theory of contract (e.g., Curtis Bridgeman, *Reconciling Strict Liability with Corrective Justice in Contract Law*, 75 *FORDHAM L. REV.* 3013 (2007)), under which parties are entitled to have their intended interpretation enforced because that is the only interpretation they truly agreed to.

first intent, by the prior probability that any two parties would have that intention. If the product of these two probabilities is greater than the product of the same operation for the second possible intent, then the court should interpret the contract as calling for the first intention.²⁰

A robust empirical literature documents the “base rate fallacy”—the tendency of individuals to overweight the value of new evidence (such as the written contract) and underweight the value of prior probabilities when making judgments.²¹ As a result, judges (and those evaluating the quality of judicial rulings) are likely to overweight the relevance of written contracts and underweight outside evidence when seeking to determine the parties’ true intent. Bayes’ rule, however, demonstrates that if the natural reading of a contract suggests an intention that is extremely unusual within the population of contracting parties, then the meaning associated with the natural reading may be less likely to be the true meaning than an unnatural reading associated with the more common preference.

It is useful to note that conventional “gap filling” represents one extreme of this Bayesian interpretative format. If a written contract does not provide any evidence in favor of one meaning relative to another, then the court chooses a meaning based entirely on the prior probability of one intent or the other. The court chooses the intent that is the more likely meaning of any two parties that contract—a majoritarian default rule.

B. Illustrating Bayesian Contractual Interpretation in Case Law

1. Jacob and Youngs v. Kent

To illustrate Bayesian contractual interpretation, consider the celebrated case of *Jacob and Youngs v. Kent* (“JY”).²² In JY, the New York Court of Appeals was presented with a contract between a builder, Jacob and Youngs, and a landowner—Kent—who hired Jacob and Youngs to build a home. The contract included a term for Reading Pipe, “all wrought iron pipe must be well galvanized, lap welded pipe of the grade known as standard pipe of Reading manufacture,” and a “perfect tender” term stating that “any work furnished by the Contractor, the material or workmanship of which is defective or which is not fully in accordance with the drawings and specifications, in every respect,

$$^{20} \text{Formally, let } P(B = b_i | W) = \frac{P(W | B = b_i) * P(B = b_i)}{P(W)}$$

Where B is the parties’ true intent, W is the written document, and b_i is the i th possible intent.

$P(B = b_i | W)$ is the probability of the true intent being b_i given (conditional on) the writing W .

$P(W | B = b_i)$ is the probability of getting the writing W given that the true intent is b_i . $P(B = b_i)$ is the unconditional probability that a bargain would be for b_i . $P(W)$ is the unconditional probability of finding a writing W .

²¹ See Daniel Kahneman & Amos Tversky, *On The Psychology of Prediction*, 80 PSYCHOL. REV. 237 (1973).; Daniel Kahneman & Amos Tversky, *The Evidential Impact of Base Rates*, in Judgment Under Uncertainty: Heuristics and Biases (Daniel Kahneman, Paul Slovic, & Amos Tversky, ed., 1985).

²² 129 N.E. 889 (NY 1921). For a recent examination of this case criticizing the majority opinion, see Alan Schwartz and Robert Scott “Market Damages and the Economic Waste Fallacy”, 108 Columbia Law Review 1610 (2008).

will be rejected and is to be immediately torn down, removed and remade or replaced in accordance with the drawings and specifications, whenever discovered.”

While Jacob and Youngs was building the home for Kent, it used some pipe of non-Reading manufacture. The pipe that was used—Cohoes brand pipe—was of similar quality to Reading. Kent’s architect directed Jacob and Youngs to “do the work anew”, knocking down the home and installing Reading brand piping. Jacob and Youngs refused to do so. When Kent declined to pay a final balance, Jacob and Youngs sued Kent. Kent claimed that the final payment was not required because of the failure to install Reading Pipe.

In *JY*, the court was required to interpret the written language concerning “Reading manufacture.” Did “Reading manufacture” indicate that the parties meant Reading brand pipe specifically or did the parties mean pipe of Reading quality? Alternatively, the court was required to infer the parties’ intended remedy in the event that pipe of Reading quality but non-Reading manufacture was used. The New York Court of Appeals’ majority opinion, written by Justice Cardozo, concluded that the parties truly intended to demand pipe of Reading quality. The Cohoes pipe constituted substantial performance, leaving Kent with only nominal damages for the lack of Reading brand pipe. A forceful dissent by Justice McLaughlin emphasizes that Jacob and Youngs failed to perform its written obligation to provide pipe of Reading manufacture.

In the Bayesian framework, the Court of Appeals sought the most likely meaning of the contract given the contract as written and the Court’s background knowledge about the likelihood that parties would mean to specify a specific brand of pipe.

The terms “Reading manufacture” are more likely to be used if the parties intended Reading brand specifically rather than pipe of Reading quality. Why use the language “Reading manufacture” and demand perfect tender if the parties’ intention was only to use pipe of Reading quality?

To put numbers on this intuition (see Table 1), suppose that there are 200 builder/landowner pairs. All (100%) contracting pairs that want Reading pipe specifically choose a contract that specifies “Reading manufacture” (5/5), while only 5.1% (10/195) of contracting parties that care about pipe quality would write a contract calling for “Reading manufacture”.²³ While there is some chance that the terms “Reading manufacture” meant Reading quality but was inaccurately drafted, parties that wanted Reading pipe specifically are considerably more likely to write “Reading manufacture” than parties that only care about Reading quality.

Table 1: The Number of Contracting Parties With Particular Intentions or Contract Writings

Written Contract \ Underlying Intention	Calls for “Reading Manufacture”, Specifies Perfect Tender.	Emphasizes Pipe Quality Rather than the Manufacturer.	Total
Reading Pipe Brand	5	0	5

²³ Note that if the words “Reading manufacture” were used as a codeword for “wrought iron pipe”, see Richard Danzig, *The Capability Problem in Contract Law* (Foundation Press, 1970), then the probability that parties who want wrought iron pipe would use the terms “Reading Pipe” would be higher than 2%. This would make the Bayesian argument in favor of Cardozo’s opinion even stronger.

Specifically			
Pipe of Reading Quality	10	185	195
Total	15 (10/15 desire pipe of Reading quality)	185	200

At this point, it may seem like the dissent has the better argument. What more does a person have to do to get Reading pipe specifically? This intuition represents an instance of the “base rate fallacy”, however, in which people overweight the most salient information relative to information about the underlying base probabilities of different events.

Suppose that the large majority of contracting parties who discuss piping in contracts care only about pipe quality rather than pipe brand. 97.5% of builder-homeowner pairs (195 out of 200) intend to specify quality when discussing pipes, while 2.5% (5 out of 200) intend to specify a particular brand of pipe--such as Reading.

A court with these pieces of information should decide which underlying intent—Reading brand specifically or Reading quality-- is more likely, given that the contract specifies “Reading manufacture” and demands perfect tender. According to the tables above, there will be 15 total contracts that call for “Reading manufacture” from this population of 200 builder/landowner pairs. Five of these fifteen contracting pairs will want Reading pipe specifically while ten only intended to specify Reading quality. The written contract of JY is thus 2/3 (10/15) likely to be the result of a desire for Reading quality combined with poor drafting, and 1/3 (5/15) likely to be the result of a desire for Reading specifically combined with good drafting. There are more parties who desire Reading Pipe quality and express themselves unusually than there are parties who desire Reading Pipe specifically and express themselves naturally. A court following Bayes’ Rule that wants to actualize the parties hypothetical bargain should follow the Cardozo majority and find for Reading quality.

2. Peevyhouse v. Garland Coal Co.

Bayes’ Rule also helps explain the controversial decision of *Peevyhouse v. Garland Coal and Mining Co.*²⁴ In *Peevyhouse*, a mining company and homeowner signed a contract allowing the mining company to strip mine on the homeowner’s land. The contract contained an unusual provision providing that the mining company would fill “the pits dug on said premises”. After the mining operations were finished, the homeowners requested that the mining company fulfill its contractual obligations. The mining company refused and the homeowners sued. In a much criticized decision,²⁵ the court ruled that the damages were limited to the small reduction in the market value of the land (one possible meaning), rather than the cost of the filling work (the other possible meaning).

²⁴ 382 P.2d 109 (OK 1962). For critiques of the decision, see e.g., Judith Maute, *Peevyhouse v. Garland Coal and Mining Co. Revisited: The Ballad of Willie and Lucille*, 89 Nw. U. L. Rev. 1341 (1995); Peter Linzer, *On the Amorality of Contracts Remedies—Efficiency, Equity, and the Second Restatement*, 81 COLUM. L. REV. 111, 117 (1981).

²⁵ See, e.g., Judith Maute, *Peevyhouse v. Garland Coal and Mining Co. Revisited: The Ballad of Willie and Lucille*, 89 Nw. U. L. Rev. 1341 (1995); Peter Linzer, *On the Amorality of Contracts Remedies—Efficiency, Equity, and the Second Restatement*, 81 Colum. L. Rev. 111, 117 (1981).

The Bayesian framework provides partial justification for the decision. The unconventional written terms in the contract calling for the restorative work provide strong evidence that the parties agreed to have the work done even if the costs outweighed the benefits. So why not just interpret the contract according to its plain meaning? This would be ignoring the base rate. The court in *Peevyhouse* seems acutely aware that “it is highly unlikely that the ordinary property owner would agree to pay \$29,000 for the construction of improvements upon his property that would increase its value only about \$300.” In other words, the court is appealing to base rates. The unconditional probability of agreeing to such economically “unreasonable and unrealistic” behavior is minimal. Indeed, the base rate of such unreasonable behavior may be low enough to justify a holding that appears to contradict the best reading of the contract. The court is saying that it is more likely that the parties chose terms poorly but did not want economically insane restorative work done than it is that they wrote the contract well and wanted the work done under any circumstance.

This is not to say that the *Peevyhouse* ruling is unambiguously correct. Suppose that there is a third possible meaning, wherein the parties agree to do restorative work that costs up to five times as much as it adds to land value. Such an agreement might still be unusual within the population. But it is less unusual than the probability that the parties would have intended restorative work that costs almost 100 times more than it adds to market value. Indeed, when combined with the written language of the contract, which makes more sense if the parties agreed to spend more than the change in market value, it may well be the case that the best Bayesian interpretation of the contract is for costs that are five times as much as the diminution in market value rather than equal to the diminution in value or equal to the costs of restoration. An intermediate level of damages may well have been a better outcome in *Peevyhouse* than either diminution in value damages or cost of completion damages.

C. Applying Bayes’ Rule When Judges Make Errors

Judicial estimates of the background probabilities of intentions as well as the likelihood that parties would write a certain contract given an intention are both subject to error.²⁶ Moreover, the stronger the court’s belief about a given probability, the more likely it is that the belief is overestimated. For example, a court that assumes that no parties would ever want Reading pipe specifically may have underestimated the probability of Reading pipe specific desires, but cannot have overestimated them—there cannot be fewer than zero parties that want Reading Pipe specifically. Alternatively, a court perceiving “Reading manufacture” could only have been written by parties that wanted Reading Pipe specifically may be overestimating the clarity of the language but cannot be underestimating it.

Knowing this possibility of errors, Bayesian courts should discount strong beliefs about prior probabilities or its ability to infer intents solely from the language of the contract. An error prone court that is certain that no parties want Reading Pipe specifically should instead assume that only a very small minority of parties would want Reading Pipe. Error prone Bayesian courts should almost never rely exclusively on either

²⁶ Schwartz and Scott, *supra* note 12.

base rates or contractual language when making a decision about the parties' true intentions.

IV. Applications of Bayesian Contractual Interpretation

A. Idiosyncratic Parties and Contractual Language

Bayes' Rule provides a benign explanation for the surprising difficulty that idiosyncratic parties have when attempting to alter state created implied terms. Goetz and Scott argue that this difficulty provides evidence that state-created implied terms function antagonistically with explicit terms written by parties. "[C]ourts' tendency to treat state-created rules as presumptively fair often leads to judicial disapproval of efforts to vary standard implied terms by agreement."²⁷

The Bayesian statutory interpretation perspective discussed above provides an alternative explanation for default rule stickiness.²⁸ Suppose that most state-created default terms are majoritarian; the state aims to give most parties what they want. Suppose further that efforts to explicitly opt-out of state-created implied terms are at least partially unclear. In these circumstances, a majoritarian default rule would seem difficult to change. The difficulty is not because of some presumption that courts make regarding the default rule, but rather the result of a Bayesian interpretation of imperfect contractual language. If the base rate of the default preferences is much higher than the base rate of the idiosyncratic preference seemingly signaled by the contractual language, then a judge seeking to implement the parties' intent will often be justified in choosing a less natural reading associated with a higher base rate. It will therefore appear that the court is ignoring the parties' language when the court is actually choosing the most likely intention.

Non-majoritarian default rules such as penalty defaults offer a means of distinguishing between the Goetz and Scott criticism of courts' exaltation of default rules and the possibility that courts are Bayesian interpreters of contracts. If Goetz and Scott are correct that default terms obtain exalted status, then information forcing default terms should be just as sticky as majoritarian default terms. For Bayesian courts, however, a non-majoritarian information forcing default should be much easier to expressly alter than a majoritarian default. The base rate of the information forcing default is lower than the base rate of a majoritarian default, making a Bayesian court more likely to read ambiguous terms as signaling an intent to opt out of a default information forcing term.

B. The Failure of Language as Evidence of Intent

At this point, the reader may be wondering how idiosyncratic parties can ever get their desired provisions enforced when courts are Bayesian interpreters seeking to enforce the most likely intent? When written language gives perfect evidence of intent—when there is only one intent that could be associated with the contractual language in

²⁷ Goetz & Scott, *supra* note 6 at 263.

²⁸ Ben Shahaar and Pottow provide a signaling explanation for default rule stickiness. They do not explain, however, why courts should be reluctant to enforce explicit default opt-outs once the parties have overcome the signaling problem. See Omri Ben-Shahaar & John A. E. Pottow, *On the Stickiness of Default Rules*, 33 FLA. ST. L. REV. 651 (2006).

question, even accounting for mistakes²⁹—then idiosyncratic parties will always get their desired intent by drafting the appropriate language.

Problems arise, however, when written contractual language gives imperfect evidence of intent. In these cases, the evidence provided by contractual language may not be sufficient to overcome a strong prior against an idiosyncratic provision. Idiosyncratic parties may find it impossible to obtain enforcement for their desired provision due to imperfections in language as an intent specification technology.

The rarer the preference, the harder it will be to provide strong enough evidence to overcome the prior belief against the preference. In JY, for example, if there is always at least a five percent chance of language of “Reading Manufacture” being used by mistake, then it will be impossible to have a preference that is rarer than 5% enforced by Bayesian courts. If the preference for Reading brand specifically is less idiosyncratic (e.g. 20 out of 200 parties have this preference), by contrast, then the same imprecision in language will not prevent parties from getting Reading brand pipe specifically enforced.³⁰

When language provides weak evidence of intent, it will be more difficult for parties to overcome a given prior belief. A classic example is “boilerplate” terms that are not explicitly considered by the parties but are included in a contract.³¹ Boilerplate terms provide weaker evidence about the parties’ true intent than identical writings that are explicitly bargained over because it is easier for boilerplate terms to be included in contradiction to true intent.³² Boilerplate is a less precise--and less expensive--intent specification technology than original language. The probabilities in Table 1, for example, may reflect the fact that the “perfect tender” term in JY was boilerplate. If all the relevant language in JY was original, then Table 1 may need to be revised as follows, enabling a Bayesian court to rule for Kent.

Table 1b: The Number of Contracting Parties With Particular Intentions or Contract Writings When All Terms are Explicitly Bargained For

Written Contract	Calls for “Reading Manufacture”, Specifies	Emphasizes Pipe Quality Rather than	Total
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²⁹ Note that language may be “clear” on its face (i.e., follow naturally from only one possible intent), but still provide imperfect evidence of intent once the possibility of mistakes are introduced.

³⁰ When 10% of all parties want Reading brand, the revised Table 1 looks as follows

Written Contract	Calls for “Reading Manufacture”, Specifies Perfect Tender.	Emphasizes Pipe Quality Rather than the Manufacturer.	Total
Underlying Intention			
Reading Pipe Brand Specifically	20	0	20
Pipe of Reading Quality	10	170	180
Total	35 (only 10/35 desire pipe of Reading quality).	185	200

³¹ See Goetz and Scott, *supra* note 6.

³² *Morin Building Products v. Baystone Construction*, 717 F.2d 413 (Posner, J.), is illustrative. The *Morin* court rejected an assertion that a “buyer satisfaction” clause in a contract (allowing the buyer to reject for any reason) applied to aesthetics because the provision was “not drafted for this contract; it was incorporated by reference to another form contract.” As a result, the court was “left with more than a suspicion that the [buyer rejection] clauses in the form contract used here were not intended to cover the aesthetics.” *Morin*, at 415-16.

Underlying Intention	Perfect Tender.	the Manufacturer.	
Reading Pipe Brand Specifically	5	0	5
Pipe of Reading Quality	3	192	195
Total	8 (5/8 desire Reading brand pipe specifically)	192	200

In practice, the quality of the signal about the parties' intent is likely a function of the cost incurred in writing the contract. While it may be impossible to obtain enforcement of an idiosyncratic preference using inexpensive language that provides weak evidence of intent, such as boilerplate, it will more often be possible to obtain enforcement of a strange preference with more expensive bespoke language that provides greater evidence of intent.³³ As a result, idiosyncratic preferences with high surplus value may be obtainable by incurring a relatively large drafting expense. So long as even the most careful original drafting retains some imprecision about the parties' intent, however, then it may be impossible to get extremely idiosyncratic conferences enforced by a court.

V. Conclusions

The previous sections present several variations on a theme; Bayes' Rule prescribes a weighting mechanism for reaching outcomes from ambiguous contractual language and preexisting beliefs about the world (base rates). When preexisting beliefs are sufficiently strong, they justify a court in contradicting the simple reading of a contract.

In effect, Bayes' Rule demonstrates that the logic of majoritarian default rules does not end with pure contractual gaps. While it is widely accepted that courts fill in gaps in contracts with the terms that would be preferred by the majority of parties, such majoritarian sentiments normally cease whenever there is no gap but only an ambiguity. In these contexts, courts focus intently on the language of the contract, seeking to find the best reading of its terms. Bayes' Rule, however, establishes that the logic behind majoritarian rules persists in cases of substantial or even minimal contractual ambiguity. The majoritarian preference should weight the reading of the contract; the stronger the majoritarian preference and the weaker the information provided by the ambiguous contract, the more that a court should choose a meaning that implements the meaning preferred by the majority. Failure to consider the majoritarian preference when confronted with a suggestive but somewhat ambiguous written contract represents a form of the base rate fallacy and leads to interpretations that are unlikely to implement the parties' intentions.

The Bayesian interpretative framework can be expanded to account for goals outside of giving the parties their true intent. Future work, for example, might place

³³ Similar results apply to testing for rare diseases. Because perfect tests for rare diseases are prohibitively expensive, it may be impossible to prove the existence of a rare disease with only one test. Instead, multiple rounds of testing may be necessary to prove that an initial positive test is not a false positive. See John Allen Paulos, *A Mathematician Reads the Newspaper* (1995).

greater weight on the simple language of the contract than would be justified for purposes of determining intent as an incentive for parties to draft documents more clearly.