Logocratic method and the analysis of arguments in evidence

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Legal analysis is dominated by legal arguments, and the assessment of any legal claim requires the assessment of the strengths and weaknesses of those arguments. The 'logocratic' method is a systematic method for assessing the strengths and weaknesses of arguments. More specifically, it is a method designed to help the analyst determine what degree of warrant the premises of an argument provide for its conclusion. Although the method is applicable to any type of argument, this essay focuses on the logocratic framework for assessing the strengths and weaknesses of *evidentiary* legal arguments, arguments offered in litigation in which evidentiary propositions are proffered to support hypotheses. The focus is on American law, but the logocratic analysis offered here could be adjusted without much trouble to handle arguments about evidence in other systems of litigation. In any legal system that aspires to have a fact-finding process that is sufficiently reliable to meet the requirements of justice, we might fashion an analogue for the Socratic maxim 'the unexamined life is not worth living': the unexamined evidentiary argument is not worth believing. The logocratic method seeks to help the evidence analyst pursue that Socratic mission, tailored to the rules and institutions of evidence law.

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1. Introduction to the concept of the 'logocratic' method

Legal analysis is dominated by legal arguments, and the assessment of any legal claim requires the assessment of the strengths and weaknesses of those arguments. According to a simple definition of 'argument' (a more precise definition is offered below), an argument is a set of propositions (one or more), called 'premises', that is offered (or can be taken) to support another set of propositions (one or more), called 'conclusions'. The 'logocratic' method is a systematic method for assessing the strengths and weaknesses of arguments.[1] More specifically, it is a method designed to help the analyst determine what *degree of warrant* the premises of an argument provide for its conclusion. The method is applicable to any type of argument and is specially designed to aid analysis of arguments that are presented in natural language non-formally.

The analysis of any claim made in the course of litigation about evidence or about rules of evidence, like the assessment of legal claims more generally, requires the assessment of the strengths and weaknesses of arguments. We may distinguish these two basic types of arguments made under the aegis of the law of evidence: *interpretive* arguments, arguments about how to interpret rules and precedents (such as Justice Souter's argument in *Old Chief* about how to interpret FRE

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[1] The Greek 'λογος' [*logos*] means 'argument' and 'κρατος' [*kratos*] means 'strength' – compare, 'democracy', the strength of the *demos*.

$403,^{2}$ or the Supreme Court's argument about how to interpret FRE 702 in *Daubert*[3] and *Kumho Tire*[4]) and *evidentiary* arguments, arguments proffering evidentiary propositions to support hypotheses. Judges and lawyers make the latter kinds of arguments—we will refer to them as 'evidentiary' arguments—for many different purposes, guided by different doctrinal rules. To take a few examples from the foundational rules of evidence (rules on relevance, materiality, and admissibility): Judges and lawyers make evidentiary arguments in an attempt to carry burdens of production and burdens of persuasion; they make evidentiary arguments in an attempt to have proffered evidence admitted (put before the factfinder) or excluded (withheld from the factfinder); in their effort to get proffered evidence admitted (or excluded), they make evidentiary arguments to show that evidence is (or is not) material or is (or is not) logically relevant or is (or is not) pragmatically relevant or is (or is not) logically relevant or is (or is not) conditionally relevant.

As noted above, the logocratic method can be used to evaluate all legal arguments,[5] and thus, perforce, it aspires to be an analytical tool that allows an evidence analyst to be precise in the evaluation of evidentiary arguments. My goal in this short essay is to provide some of the basic concepts that comprise the logocratic analysis of evidentiary arguments and to offer one detailed illustrative application of the logocratic method to a case litigated under evidence law. My focus throughout this essay is on American law, but the logocratic analysis offered here could be adjusted without much trouble to handle arguments about evidence in other systems of litigation.

2. Some background concepts for explaining and exemplifying logocratic method applied to legal arguments

Several defined concepts will help to explain the logocratic method as applied to legal arguments generally and to evidentiary legal arguments specifically.

2.1 *Argument*

From an epistemic point of view, an *argument* is a set of propositions (one or more), called 'premises', that are offered to provide *inferential warrant* for another set of propositions (one or more), called 'conclusions'. To say that one proposition, label it 'ε' (this is a premise in the sense just defined), provides *inferential warrant* for another proposition, label it 'h' (this is a conclusion in the sense just defined), is to say that, according to the argument presented, the truth of ε would to some extent support the claim that 'h' is true. For example, the two premises ε_1 and ε_2 may be offered to provide inferential warrant for the conclusion h in this argument:

ε_1 All men are mortal.

ε_2 Socrates is a man.

therefore

h   Socrates is mortal.

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[2] See *Old Chief* v. *United States*, 519 U.S. 172 (1997).

[3] See *Daubert* v. *Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993).

[4] See *Kumho Tire Co*. v. *Carmichael* 526 U.S. 137 (1999).

[5] For an illustration of this method used to analyse a decision by Judge Posner in a contracts case in which he is making legal arguments but not specifically arguments about evidence, see Brewer, *Satisfaction and Posner's Morin Opinion: Aliquando Bonus Dormitat Posnerus?,* 120 Harv. L. Rev. 1123 (2007).

2.2 *Logic and logical form*

Logic is the study of the different modes of logical inference that different kinds of arguments display. An argument's *mode of logical inference* (or, synonymously, its *logical form*) is *the evidential relation between the argument's premises and its conclusion*.[6] In accord with this conception of logic, we may say that an argument's logical form is the evidential relation between the argument's premises, ε_i, and its conclusion(s), h_i.

(Important note about my terminology in this article. The definition of 'logic' just offered calls for a distinction between *empirical* and *non-empirical* evidentiary arguments. Under this definition of 'logic', every argument is 'evidentiary' because in every argument premises are offered as providing some degree of evidentiary support for conclusions. In a *modus ponens* argument 'If P then Q and P, therefore Q', e.g. premises 'P' and 'Q', taken together, provide *evidential* support for conclusion 'Q' under this definition of 'logic', but it is not *empirical* evidential support—although a *modus ponens* can of course be used to establish *empirical* propositions. In this article, I focus the logocratic analysis of those arguments that are offered to establish conclusions that are *empirical* propositions, such as conclusions about the who, what, why, when, where, and how that comprise so much of the litigation conducted under the aegis of evidence law. To save the cumbersome repetition of the phrase 'empirical evidentiary support'—and its cognate phrases—I will refer only to 'evidential support'—and its cognate phrases—but always meaning to refer thereby to *empirical* evidential support.)

2.3 *The four modes of logical inference*

There are four fundamental modes of logical inference, which are distinguished from one another by the relation that obtains between the premises of the argument and its conclusion when the argument yields the most warranted inference from premises to conclusion that it is logically capable of yielding. All four modes of logical inference are found in legal argument but are of course not limited to legal argument. Because *all* arguments, including legal arguments, are fairly represented by one or more of these four modes of logical inference, it is a mistake to refer to a special 'logic of legal argument'.

Philosophers of logic dispute whether there really are four basic types of logical inference, and whether all of those on my list actually belong. For reasons I will not offer here, I recognize four distinct, irreducible modes of logical inference.

1. ***Deduction***: In a *valid* deductive argument, it is logically impossible that the premises should all be true while the conclusion is false. That is, the truth of the premises of a valid deductive argument provides *incorrigible evidence* for the truth of its conclusion.

2. ***Induction***: In an inductive argument, the premises provide *probabilistic evidential warrant* for the conclusion (with probability less than 1). There are two main forms: inductive *generalization* from observation of several individuals, and inductive *specification*, the application of a previously made generalization to an individual.[7] (These two forms of inductive argument are explained in greater detail below.[8])

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[6] Cf. B. Skyrms, *Choice & Chance* 4 (1966) ('Logic is the study of the strength of the evidential link between the premises and conclusions of arguments.').

[7] Stephen Barker refers to this as 'inductive analogy', which is not suitable for my purposes. See S. Barker, *Elements of Logic* 192 (5th ed. 1989).

[8] See infra page 31 and following.

3. ***Inference to the best explanation*** ('IBE'; also, 'abduction'): Inference to the best explanation involves, as its name suggests, inference to an *explanation* of some fact or set of facts. In this argument, a statement of the phenomenon (or phenomena) to be explained and the putative explanation both appear as premises of the argument and the explanation itself is the argument's conclusion. Unlike many students of IBE, including Peirce, I believe that some IBE explanations could fairly be represented as valid deductive inference. For example, explain how a pawn in chess can appear on the same column as a pawn on the same 'team'. (Peirce and many others think they all instantiate the fallacy of affirming the consequence.) Thus, in my view, sometimes the premises of IBEs provide incorrigible evidence for the truth of their conclusions, and sometimes only probabilistic warrant (probability less than 1).

4. ***Analogy***: In an analogical argument, one reasons that because two or more items share some characteristics, one can infer that they share an additional characteristic that is of particular interest to the reasoner. *Within* analogical inference, IBE operates to discern the pattern relating the sharing of some characteristics and the inferred sharing of an additional characteristic that is of interest to the reasoner. As Peirce noted, there is a 'flash of insight' analogical inference, in which examples are used as heuristics to *convert examples into rules*. Unlike most analysts of analogy, I believe that for some analogical arguments the premises provide incorrigible evidence for the truth of their conclusions. (Refutation by logical analogy is an example— is Descartes' inference or, more accurately, an inference fairly attributable to Descartes in the *First Meditation*,[9] 'My senses sometimes deceive me, therefore, it's possible that they always deceive me', deductively valid?—here a refutation by logical analogy is possible in which the premises of the argument provide incorrigible evidence for the conclusion.[10]). For

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[9] Descartes' *First Meditation* contains these passages:

'Everything which I have thus far accepted as entirely true and assured has been acquired from the senses or by means of the senses. But I have learned by experience that these senses sometimes mislead me, and it is prudent never to trust wholly those things which have once deceived us.

… But perhaps God did not wish me to be deceived in that fashion, since he is said to be supremely good. But if it was repugnant to his goodness to have made me so that I was always mistaken, it would seem also to be inconsistent for him to permit me to be sometimes mistaken, and nevertheless I cannot doubt that he does permit it'.

Rene Descartes, *Meditations on First Philosophy* 18–20 (Laurence J. Lafleur trans., 2d ed. 1960).

[10] An analogical argument—refutation by logical analogy—offered to show that the argument 'My senses sometimes deceive me, therefore it's possible that they always deceive me' (whether fairly attributable to Descartes or not, see note 9) is not deductively valid, proceeds like this:

(1) One argument I am considering claims: 'My senses sometimes deceive me; therefore, it might be the case that they always deceive me'. Another argument claims: 'God sometimes permits me to be mistaken; therefore, it could be the case that God always permits me to be mistaken'. [These are 'target' items.]

(2) One might argue: 'Some paintings are forgeries; therefore, it could be the case that all paintings are forgeries'. [This is the 'source' for the analogy.]

(3) The argument in (2)—'Some paintings are forgeries, therefore; it could be the case that all paintings are forgeries'—is invalid [since at least one painting must be an original in order for there to be a forgery].

(4) Any argument that has the structure 'Some things have some specified property; therefore, it could be the case that all things have that property' is an invalid argument [since the premises could be true and the conclusion false].

(5) Therefore, the arguments I am considering ('My senses…' and 'God sometimes…') are not valid.

Here the analogy-warranting rule (as explained and justified by its analogy-warranting rationale) is *deductive*, based, as it is, on principles of (modal predicate) logic. I present and discuss this example in Brewer, *Exemplary Reasoning: Semantics, Pragmatics, and the Rational Force of Legal Argument By Analogy*, 109 Harv. L. Rev. 923, 968–70 (1996). Elsewhere in that article I define the terms 'source', 'target', 'analogy-warranting rule', 'analogy-warranting rationale'.

other analogical arguments, such as those used in empirical science, the premises provide only probabilistic evidential support.

2.4 *The enthymeme*

Logocratic analysis is designed to handle a familiar problem in the evaluation of non-formal legal arguments: they are very often *enthymematic*. An 'enthymeme' is any argument, deductive or non-deductive (inductive, abductive or analogical), whose logical form is not *explicitly clear* from its original mode of presentation (presentation, e.g. in a judicial opinion or a lawyer's brief). Suppose a judge writes in an opinion resolving a contracts dispute:

> 'The plaintiff was an employee-at-will, so she could be fired for any reason or no reason at all'.

In our logocratic form, this might be represented as a premise ε that provides inferential warrant for conclusion h:

> ε_1: The plaintiff was an employee-at-will.
>
> therefore,
>
> h: The plaintiff could be fired for any reason or no reason at all.

Is that a valid deductive argument? Taken as literally quoted, it does not seem to be so, because by its literal terms the argument provides no reason to believe that *every* employee that is an at-will employee can be fired for any reason or no reason at all. Without more, it is easily conceivable that some types of employee-at-will can be fired only for cause. But perhaps we, as interpreters of the judge's argument who seek to give a fair formal representation of this argument which is presented in the non-formal setting of a judicial opinion, conclude that the argument, properly interpreted, is not deductively invalid. Perhaps we believe that the judge was using a shortcut and that he did not feel the need to state explicitly that he was assuming—and assuming that his interpreters would know that he was assuming—that *all* employees-at-will can be fired for any reason or no reason at all. If we believe that the judge, in offering this argument from ε_1 to h, was relying on an *unstated but assumed* premise, '*All* employees-at-will can be fired for any reason or no reason at all', then we would conclude that the best way to interpret the judge's argument is as follows:

> ε_0 All men are mortal. [not originally stated, but assumed by the argument]
>
> ε_1 Socrates is a man.
>
> h Socrates is mortal.
>
> ε_0: All employees-at-will can be fired for any reason or no reason at all.
>
> ε_1: The plaintiff was an employee-at-will.
>
> therefore,
>
> h: The plaintiff could be fired for any reason or no reason at all.

—which is a valid deductive argument. In this example of how we might interpret the judge's argument, we conclude that the true logical form of the argument (that premises ε_0 and ε_1 provide inferential warrant for h) was not entirely clear from the way in which it was originally presented (which looked at first glance like the argument that ε_1 by itself provided the inferential warrant for h). That is, we have judged that the argument is an *enthymeme*, an argument, as defined above, whose logical form is not *explicitly clear* from its original mode of presentation.

Note that we shall have to give some attention to the circumstances under which we think *we*, as *interpreters* of arguments, are warranted in treating them as enthymemata (the plural of 'enthymeme'). After all, if we add the right premise, every argument could be interpreted as a valid deductive argument. But surely we do not believe that every argument is a valid deductive argument or indeed is a deductive argument at all—some are inductive, some analogical, some abductive.

Note also another reason for care in interpreting enthymemata. Philosophers have long regarded 'All men are mortal, Socrates is a man, therefore, Socrates is mortal' as the paradigm of a valid deductive inference. So, surely it seems to be. But consider what must be the warrant *for the first premise*, 'All men are mortal'. Surely it rests on a—highly confirmed, to be sure—inductive generalization? How could the 'Socrates syllogism' be interpreted not as a deductively valid inference but as an *inductive specification* (application of an inductive generalization to an individual, where the major premise is not assumed or known to be a true *universal* generalization, which inductive generalizations are incapable of producing)? What criteria should we use? The logocratic analyst tries to be sensitive to such questions.

3. Logocratic analyses specific to evidence law

The concern of this section is to provide some conceptual tools that can assist the analysis of *evidentiary* enthymematic arguments, namely, arguments made when a litigant proffers evidence to support some hypothesis in attempting to establish or refute a claim in civil or a charge in criminal law. These tools are sensitive to:

(i) The interaction of *substantive law* (law in such areas as contract, tort, property, criminal law) and *adjective law* (law consisting of rules of procedure and evidence). This is discussed below in the presentation and illustration of three types of evidentiary claims relevant to evidence law.

(ii) The way in which rules of evidence and procedure shape the evidentiary arguments litigants and judges make, which in turn dictates the *modes of representation* of those evidentiary arguments. This is discussed below in the presentation and illustration of the concepts of *underlying evidential claim*, *evidentiary enthymeme*, *defeasibility* and *defeasiary modes of representing evidentiary arguments*, *inductive* inference (which looms so large in evidentiary arguments), the *three burdens* litigants must 'carry' (pleading, procedure and persuasion), *materiality*, *logical relevance*.

3.1 *Three types of evidentiary claims relevant to evidence law*

3.1.1 *Non-law-related evidentiary claim*   A *non-law-related evidentiary claim* is an evidentiary claim made outside the formal process of trial procedure. Obviously such claims occur in a vast range of settings, some on jobs, others in 'everyday life'. Here are some examples of non-law-related evidentiary claims that come up with a Google search of the phrase 'evidence does not support':

'The evidence does not support a correlation between serum vitamin B(12) or folate and cognitive impairment in people aged over 60 years'.

'The available evidence does not support the claim that fossil fuels are the source of increasing concentrations of atmospheric carbon dioxide'.

'The evidence does not support the claim that autism is caused by vaccines'.

Obviously any setting for a non-law-related evidentiary claim could become associated with litigation, and in that way could somehow figure in a substantive-law-related evidentiary claim or in an adjective-law-related evidentiary claim (these terms are explained below). Note that, despite not being made within the confines of formal litigation, non-law-related evidentiary claims are extremely important for evidence law. That is because these are the kinds of claims on which judges and juries rely pervasively when they deploy the 'every day common sense' that underwrites the inductive inferences they make when they are involved as decision makers in formal litigation.[11]

3.1.2   *Substantive-law-related evidentiary claim*.   The phrase 'substantive law' refers to the body of rules that determines the rights and obligations of individuals and collective bodies in all categories of public and private law, including contracts, property, torts and criminal law. Substantive-law-related evidentiary claims are claims about the evidence that supports the hypotheses that are specified by rules of substantive law as logical elements of claims, charges or defences. Here is an example from the substantive law of contracts—the rule for promissory estoppel:

RULE FROM RESTATEMENT (SECOND) OF CONTRACTS § 90

"A promise which the promisor should reasonably expect to induce action or forbearance on the part of the promisee or a third person and which does induce such action or forbearance is binding if injustice can be avoided only by enforcement of the promise. The remedy granted for breach may be limited as justice requires."

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[11]   See, e.g. Advisory Committee Note to Federal Rule of Evidence 201, Federal Rules of Evidence (1996) (emphasis added):

'[E]very case involves the use of hundreds or thousands of non-evidence facts. When a witness in an automobile accident case says "car," *everyone, judge and jury included, furnishes, from non-evidence sources within himself*, the supplementing information that the "car" is an automobile, not a railroad car, that it is self-propelled, probably by an internal combustion engine, that it may be assumed to have four wheels with pneumatic rubber tires, and so on. The judicial process cannot construct every case from scratch, like Descartes creating a world based on the postulate Cogito, ergo sum.'

See also **Byrd v. Lord Brothers Contractors, Inc.** 473 P.2d 1018, 1020 (Or. 1970) (emphasis added):

'The jury, of course, realized that there was the possibility that the concrete was thrown from the overpass by someone, because the public had access to the overpass. *From the jury's knowledge of everyday life*, it could have legitimately concluded that boys are inclined to run away from the scene of a wrong. From the same knowledge, they could believe that children are more likely to throw things from an overpass than are adults. Under these circumstances, we cannot say that the admitted testimony had no probative value."

LOGICAL ELEMENTS OF THIS RULE:

h_{n1} There is a promise.

h_{n2} The promise is one for which the promisor should reasonably expect to induce action or forbearance on the part of the promisee or a third person

h_{n3} The promise does induce action or forbearance on the part of the promisee or a third person on the part of the promisee or a third person.

h_{n4} Injustice can be avoided only by enforcement of the promise.

h_{n5} The promise is binding.

LOGICAL FORM OF THIS RULE:

If (h_{n1} & h_{n2} & h_{n3} & h_{n4}) **then** h_{n5}

EVIDENTIARY REQUIREMENTS OF THIS RULE:

For *each* of these logical elements, h_{n1}, h_{n2}, h_{n3} and h_{n4}, substantive contract law requires that there be some *evidence* that is adequate to support the conclusion that the element is satisfied, evidence that we can label, in the logocratic scheme, 'ε_{n1}', 'ε_{n2}', 'ε_{n3}' and 'ε_{n4}', respectively. That is, in contracts litigation, a plaintiff who wanted to claim that there was a binding promise under this rule (i.e. that what is labelled above as 'h_{n5}' is true on the facts of the case) would have to provide evidence that each element in the rule is satisfied. So, e.g. evidence for h_{n1} in a given case might be testimony:

ε_{n1} The plaintiff testified that the defendant promised to pay for her son's medical treatment

which could be offered to prove

h_{n1} There was a promise by the defendant to pay for the plaintiff's son's medical treatment.[12]

(Interesting question: *What kind of evidence might the plaintiff proffer to prove the element labelled* 'h_{n-4}'" —'Injustice can be avoided only by enforcement of the promise'?[13])

3.1.3   *Adjective-law-related evidentiary claim.*   The phrase 'adjective law' is a somewhat archaic but useful phrase that, as noted above, refers to those rules of law that govern evidence, pleading and procedure. The analogy is to grammar: adjectives modify 'substantives' (like nouns and pronouns), and adjective law 'modifies' (or, a better way to put it, facilitates) substantive laws. It can be very analytically clarifying to note that *the application of rules of evidence itself calls for a wide variety*

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[12] Note that several distinct types or 'pieces' of evidence could in principle be offered for a single hypothesis—testimony, documentary evidence, etc. So, in our scheme, for h_{n1} a proponent could offer ε_{n1a} and ε_{n1b}, etc. It would be up to a trial judge under 403 to decide whether several such pieces of evidence offered for the same hypothesis were needlessly cumulative, time wasting, etc.

[13]   With delightful understatement a state appellate court that has adopted the version of the promissory estoppel rule quoted above notes that this element of the rule 'is not cast with precision'. *Midwest Energy, Inc.* v. *Orion Food Sys., Inc.*, 14 S.W.3d 154, 161 (Mo. App. E.D. 2000). The vagueness of that element of the rule creates an interesting question regarding how a litigant is to go about providing evidence to prove it.

of evidentiary claims that are distinct from substantive-law-related evidentiary claims. It is to this type of evidentiary claim that the phrase 'adjective-law-related evidentiary claim' is intended to refer. Adjective-law-related evidentiary claims are claims about the evidence that supports those hypotheses that are specified as logical elements by a rule of evidence law or a rule of pleading or procedure.

Here is an example from the evidence law—the rule defining hearsay in FRE 801:

RULE FROM FRE 801(A)–(C)

Rule 801. Definitions...The following definitions apply under this article:

(a) Statement. A 'statement' is (1) an oral or written assertion or (2) nonverbal conduct of a person, if it is intended by the person as an assertion.

(b) Declarant. A 'declarant' is a person who makes a statement.

(c) Hearsay. 'Hearsay' is a statement, other than one made by the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted.

LOGICAL ELEMENTS OF THIS RULE:

h_{n1} There is a statement.

h_{n2} The statement was made by a declarant *not* while testifying at the trial or hearing.

h_{n3} The statement is offered for the truth of the matter asserted.

h_{n4} The statement is hearsay.

LOGICAL FORM OF THIS RULE:

If (h_{n1} & h_{n2} & h_{n3}) **then** h_{n4}

EVIDENTIARY REQUIREMENTS OF THIS RULE:

Note that for many of the FRE there are several pairs of ε_n/h_n: $\varepsilon_{n1}/h_{n1}, \varepsilon_{n2}/h_{n2}$, because the rules often specify more than one logical element that must be satisfied in order to satisfy the rule. Thus, in the example above of 801(a)–(c), there are three logical elements, h_{n1}, h_{n2} and h_{n3} (which are called 'jointly sufficient conditions') such that, when all three are true, h_{n4} is true as well.

For each element h_{n1}, h_{n2} and h_{n3}, there will be evidence used to establish it, which we can label 'ε_{n1}', 'ε_{n2}' and 'ε_{n3}', respectively, and some decision maker must decide whether the evidence supports the element (hypothesis) for which the evidence is offered. In this case, we know from FRE 104 that the judge is to decide whether the logical elements in FRE 801, h_{n1}, h_{n2} and h_{n3}, are all satisfied. If she decides that they are all satisfied, then she must further decide whether the logical elements of some exemption or exception are also satisfied. Note that substantive-law-related evidentiary claims are also claims about pairs of ε_n / h_n, $\varepsilon_{n1} / h_{n1}$, $\varepsilon_{n2} / h_{n2}$.... The difference is that those claims are made to satisfy the logical elements of rules of substantive laws, whereas adjective-law-related evidentiary claims are made to satisfy the logical elements of rules of evidence and procedure.

3.2 *Underlying evidential claims*

An underlying evidential claim is the claim that the truth of some proposition ε provides rational support for some other proposition h.

3.3 *The evidentiary enthymeme*

When a given enthymeme is an underlying evidential claim, it is an 'evidentiary enthymeme'. That is, every underlying evidential claim is an enthymeme that can be fairly interpreted into an argument that represents its logical form.

We will see a detailed example of this in an illustration drawn from *Knapp* v. *State*. For now, notice that each of the following is an instance of an evidentiary enthymeme, in which an evidentiary proposition ε is offered to help establish an hypothesis h

> *Knapp* v. *State* (79 N.E. 1076) (this case will be examined in greater detail below to illustrate how many of the logocratic concepts and methods discussed in this essay can be used to analyse the argument offered by a judge to resolve an evidentiary claim)
>
> ε: Witness doctor testified that the old man died of alcoholism and senility (not of a beating).
>
> h: the defendant acted in self-defence because he feared for his life.
>
> Old Testament, 1 Kings 3:16–28[14]

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[14] The relevant text, in the King James version, is as follows:

16 Then came there two women, that were harlots, unto the king, and stood before him.

17 And the one woman said, O my lord, I and this woman dwell in one house; and I was delivered of a child with her in the house.

18 And it came to pass the third day after that I was delivered, that this woman was delivered also: and we were together; there was no stranger with us in the house, save we two in the house.

19 And this woman's child died in the night; because she overlaid it.

20 And she arose at midnight, and took my son from beside me, while thine handmaid slept, and laid it in her bosom, and laid her dead child in my bosom.

21 And when I rose in the morning to give my child suck, behold, it was dead: but when I had considered it in the morning, behold, it was not my son, which I did bear.

22 And the other woman said, Nay; but the living is my son, and the dead is thy son. And this said, No; but the dead is thy son, and the living is my son. Thus they spake before the king.

23 Then said the king, The one saith, This is my son that liveth, and thy son is the dead: and the other saith, Nay; but thy son is the dead, and my son is the living.

24 And the king said, Bring me a sword. And they brought a sword before the king.

25 And the king said, Divide the living child in two, and give half to the one, and half to the other.

26 Then spake the woman whose the living child was unto the king, for her bowels yearned upon her son, and she said, O my lord, give her the living child, and in no wise slay it. But the other said, Let it be neither mine nor thine, but divide it.

27 Then the king answered and said, Give her the living child, and in no wise slay it: she is the mother thereof.

28 And all Israel heard of the judgment which the king had judged; and they feared the king: for they saw that the wisdom of God was in him, to do judgment.

For an interesting assessment of this evidentiary enthymeme, see LaRue, *Solomon's Judgment: a Short Essay on Proof*, 3 Law Probability and Risk 13 (2004).

ε: woman A chooses not to have baby cut in two in custody battle

h: woman A is the natural mother

Union Paint and Varnish Co. v. *Dean* (137 A. 469 (1927))

ε: paint can A, bought six months earlier from the store, had defective paint

h: paint can B (unopened), bought six months later, from the same store, had defective paint.

Example discussed in E. Morgan *Basic Problems of Evidence* (this example is discussed in detail below to illustrate the logocratic analysis of logical relevance)

ε: X wrote Y's wife a love letter

h: X killed Y

Sherrod v. *Berry* (856 F. 2d 802 (7th Cir. 1988))

ε: The search of the deceased (shot by the officer) revealed that he had no weapon

h: The officer 'acted reasonably in the circumstances', namely, in self-defence

3.4 *Two logocratic methodological hypotheses*

Central to the logocratic method are two methodological hypotheses:

(i) Every identifiable argument has a *logical form* (although that form may be very unclear in its non-formal mode of presentation)

(ii) Every underlying evidential claim is an enthymeme that can be interpreted into an argument that represents its logical form.

3.5 *Defeasibility and defeasiary modes of representation*

Evidentiary arguments—i.e. arguments in which evidentiary propositions, as premises, that are offered to help establish hypotheses as conclusions—are very often not best represented as deductive arguments, but instead as either inductive, abductive or analogical arguments. And probably the most important of these three modes of logical inference in evidentiary argument is inductive inference (thus we will examine the basic structure of inductive argument in greater detail below).

Whether inductive, abductive or analogical, evidentiary arguments have another characteristic: they are defeasible. Thus, when the logocratic analyst seeks to unpack an evidentiary enthymeme into a fair representation of the evidentiary argument, she must be sensitive to the phenomenon of defeasibility and take it into account as she does the logocratic unpacking. To explain what the analysis must do, let us now define and illustrate two concepts: *defeasible argument* and the *defeasiary mode of representation*.

Defeasible argument: A defeasible argument from premises $\varepsilon_1 - \varepsilon_n$ to conclusion h is one in which it is possible that the addition of some premise(s), ε_{n+1}, to $\varepsilon_1 - \varepsilon_n$, can *undermine the degree of evidential warrant* premises that $\varepsilon_1 - \varepsilon_n$ provide for h.[15]

Consider this evidentiary enthymeme:

Argument 1

    ε_1:   Jones confessed to shooting Smith

    ε_2:   Each of five witnesses testified that he or she saw Jones shoot Smith

    ε_3:   Jones' fingerprints were found on the gun recovered at the scene of Smith's shooting.

    Therefore, (h) Jones shot Smith

Call the evidentiary enthymeme comprised by the inference to h from ε_1, ε_2 and ε_3 'Argument 1'. If ε_1, ε_2 and ε_3 were all true, how strong would they be as 'evidence' for the hypothesis h? Now suppose that the whole set of ε_1 through ε_7 are true (including, i.e. ε_1, ε_2 and ε_3). In that case, with the larger set of propositions as a background, how strong would ε_1, ε_2 and ε_3 be as evidence for h? Call the evidentiary enthymeme comprised by the inference to h from ε_1 through ε_7 'Argument 2'.

Argument 2

    ε_4:   Jones was beaten by the police and ordered to confess.

    ε_5:   Each of the five witnesses was bribed by the prosecutor to testify that he she saw Jones shoot Smith.

    ε_6:   Fingerprint evidence is reliable only 40% of the time.

    ε_7:   The technicians in laboratory to which the gun was sent for fingerprint analysis were both incompetent and corrupt.

Argument 1 is a *defeasible* evidentiary argument, as revealed by the addition of premises that comprise argument 2. In order to adequately represent what occurs in the transition from Argument 1 to Argument 2 we need a mode of representing the arguments that we interpretively unpack from the evidentiary enthymemes comprised of the inference of h from ε_1 through ε_3 (Argument 1) and then from ε_1 through ε_7 to h (Argument 2). Toward that end, we distinguish two modes of representation of legal arguments. One we will refer to as the 'defeasiary mode of representation', the other we will refer to as the 'non-defeasiary mode of representation'.

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[15] For reasons I will not offer here, I rely on an epistemic conception of defeasibility, which focuses on the rationality of belief formation and revision, rather than a formal logical conception, which focuses on non-monotonic consequence relations. Of course, each conception has important consequences for the other.

3.6   *Criteria for adequate representation of evidentiary enthymemata*

Consider two examples in which the question of what constitutes an *adequate representation* arises. The first example calls attention to the fact that there are several different possible modes of pictorial representation—including drawing, painting and photography. There are also differing possible styles of representation in these different representational media, such 'realist', 'photo-realist', 'cubist', 'futurist', etc. In some circumstances, the question might arise which mode and style of representation adequately represents the subject of the picture. Thus, a cubist painting of a person's face is not an adequate representation of that person's face for the purposes of a driver's license.

The second example arises from the process of proffering evidence in a trial. Recall the category of 'demonstrative' evidence, which includes such items as documents, diagrams, charts, models, similar objects, photographs, drawings, audio or video recordings and computer generated images. One issue for a party who wishes to have such items admitted into evidence is whether they adequately represent what they purport to explain, or model, or demonstrate (a trial judge would determine this under the rubric of evidence rules governing 'logical' and 'pragmatic' relevance).

Analogous to these examples, when one seeks to represent a specific legal argument, one must determine what *mode of representation* is capable of representing the argument adequately, for there are several different modes of argument that one might use.[16] In the discussion that follows in the next few sections, we will focus of two of these modes of representation and consider the question which of them is needed adequately to represent *the basic structure of legal argument*. One I will refer to as the 'defeasiary' mode, the other I will refer to as the 'non-defeasiary' mode. One uses the 'defeasiary' mode to represent a given legal argument when one seeks to represent that argument in a way that reflects and analyses both the defeasiary factual claims that a party makes when she attempts to carry the burdens of pleading, production and persuasion that the law assigns to her. One uses the non-defeasiary mode to represent a given legal argument when one does *not* seek to represent specific defeasible arguments. As Vaughn Ball explains:

> The legal profession spends much of its time learning, explicating, and "applying" rules of substantive law, which take the form of general propositions stating the legal consequences of certain groups of "facts." In this activity it is assumed to be known that particular instances of those facts exist, or that they do not exist, and the particular implications of those assumptions are explored. A specific proposition of law asserts a relationship of equivalence between particular members of these classes of facts, and the legal consequence, or conclusion. Since these legal definitions are treated as "true," and since the factual propositions involved are assumed to be known as either "true" or "false," the original Aristotelian syllogism is completely sufficient for such analysis.[17]

Ball's point here, and the nature of 'non-defeasiary' representation of legal argument, can both be explicated with an illustration. Consider this rule of contract law (taken from the case *Ray* v. *Eurice Bros.*, 201 Md. 115 (1952)):

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[16]   The issue of adequate representation of legal arguments generally, and legal evidentiary arguments specifically, has enjoyed a burgeoning literature generated in jurisprudence, formal logic, epistemology and artificial intelligence. To take a tiny sample, see, *Special Issue: Graphic and Visual Representations of Evidence and Inference in Legal Settings*, 6 Law Probability and Risk (2007); H. Prakken, *Logical Tools for Modelling Legal Argument* (1997); Prakken and Sartor, *The Three Faces of Defeasibility in the Law*, 17 Ratio Juris 118 (2004); Prakken, *Analysing Reasoning About Evidence with Formal Models of Argumentation*, 3 Law, Probability and Risk 33 (2004).

[17]   Ball, *The Myth of Conditional Relevancy*, 14 Georgia L. Rev. 435, 438 (1979–1980).

> The law is clear, absent fraud, duress, or mutual mistake, that one having a capacity to understand a written document who reads and signs it or, without reading it or having it read to him signs it, is bound by his signature in law ...

Presented in a way that makes this rule's criteria (necessary and sufficient conditions) slightly more perspicuous, this rule is

(1) 'IF there is no fraud AND there is no duress AND there is no mutual mistake, THEN [S] anyone having a capacity to understand a written document who reads and signs it or, without reading it or having it read to him signs it, is bound by his signature in law ...'

The judge in the case in which this rule is found applied this rule to make the argument that ultimately resolves the case:

(2) In this case, there is no fraud.

(3) In this case, there is no duress.

(4) In this case, there is no mutual mistake.

Therefore,

(5) Anyone having a capacity to understand a written document who reads and signs it or, without reading it or having it read to him signs it, is bound by his signature in law.

The judge did not rely on any judgements about the degree of likelihood of the truth of Premises 2, 3 and 4. Instead, in offering his valid deductive argument, the judge, as Ball puts it, assumes that the rule he states (the 'duty to read' Rule 1 in the text above) is true, that he knows that the facts reported in premises 2, 3 and 4 'exist', and he explores the particular implications of those assumptions.

How does an analyst of a given legal argument determine whether the defeasiary mode or the non-defeasiary mode of representation is required to represent that argument adequately? The key test focuses on how the argument appears to treat the criteria of legal rules, where criteria are those rules' necessary and sufficient conditions. If the argument appears to treat those criteria as *probabilistic*, then the defeasiary mode is required adequately to represent the argument. As this (somewhat circular) terminology suggests, the concept of defeasibility is the key to identifying the circumstances under which the defeasiary mode of representation is needed to represent an argument adequately. If the argument is defeasible, then the defeasiary mode is required adequately to represent the argument. But if the argument appears to treat those criteria as either true or false (bivalent), then the non-defeasiary mode will suffice to represent the argument.

For example, suppose that a contracts plaintiff, seeking to carry his burden of production, offers testimony to prove that there was an 'offer'. Using the schema presented earlier, this would be

ε: testimony

offered to establish the hypothesis

h_1 there was an offer

In proffering this testimonial evidence, the plaintiff relies on the underlying argument to the effect that the testimony that there was an offer makes the hypothesis for which the testimony is offered ('there was an offer') *likely*—and, at a minimum (if the plaintiff intends by presenting this evidence for this hypothesis to carry the burden of production), *sufficiently* likely that a reasonable factfinder,

applying the applicable burden of persuasion, could find that there was an offer. To represent adequately the underlying argument the plaintiff relies on when proffering this evidence one must use the defeasiary mode of representation.

By contrast, suppose a lawyer or judge is not arguing about the 'quantum' of probabilistic evidence that there was an offer, but is instead arguing about the legal *consequences* of the *assumed* truth or falsity of a 'legal fact' (such as, the fact that there was an offer). To represent adequately that kind of argument one must use the non-defeasiary mode of representation.

3.7 *The centrality of inductive inference in unpacking evidentiary enthymemata*

Evidentiary arguments, when suitably unpacked from their enthymematic form, rely heavily on inductive inference. (As is discussed below, when parties attempt to carry their burdens of production and persuasion, they rely heavily and repeatedly on inductive arguments.) Thus to explain and illustrate how logocratic analysis works to unpack evidentiary enthymemata, it will help to have a brief rehearsal of the basic structure of inductive inference. Recall that in an inductive argument, the truth of the premises cannot guarantee the truth of the conclusion, but when they are well chosen, their truth can warrant belief in the truth of the conclusion to some degree of probability. There are two main varieties of inductive inference: *inductive generalization* and *inductive specification*.

3.7.1 *Inductive generalization.* *Inductive generalization* involves generalizing from particular instances. The premises of this type of argument report features of the particulars, and its conclusion states a probabilistic generalization that is inferred from those particulars, where

'$\alpha_1 \ldots \alpha_n$' stands for a set of individual instances

'φ' stands for one property that the individuals $\alpha_1 \ldots \alpha_n$ have been noted to possess

'θ' stands for another property the individuals $\alpha_1 \ldots \alpha_n$ have been noted to possess,

the pattern of inductive generalization is:

(ε_1) α_1 is both φ and θ (i.e., has both characteristics, φ and θ)

     [e.g. Bird A was a raven and Bird A was black.]

(ε_2) α_2 is both φ and θ

     [e.g. Bird B was a raven and Bird B was black.]

(ε_3) α_3 is both φ and θ

     [e.g. Bird C was a raven and Bird C was black.]

(ε_n) α_n is both φ and θ

     [e.g. Bird N was a raven and Bird N was black.]

(ε_{n+1}) There were [few or no] observed instances of an α that was φ and also was not-θ

     [e.g. No ravens were observed to be non-black]

   h: [Probably] [**All or Most]** φ's are θ

       [e.g. Probably, **all** ravens are black.]

Note that *inductive arguments are arguments about evidence and the hypotheses the evidence is said to support*. Thus, the premises of an inductive argument are evidentiary propositions (the 'ε' in our $\varepsilon - h$ schema) and the conclusion is a hypothesis that the evidence is offered to support (the 'h' in our $\varepsilon - h$ schema).

3.7.2 *Inductive specification.*   The other type of inductive inference is *inductive specification*. Instead of reaching a conclusion about a class of individuals, an inductive specification offers a conclusion about one individual, based on a generalization about the classes to which that individual belongs. In the raven example, the inductive specification is the argument that a great many (actually, in this example, all) ravens were black, therefore, some individual raven was black (or perhaps the next observed individual raven will be black—again, see the note in the following paragraph). Note that inductive specifications are a basic form of argument for making *predictions* based on empirical evidence—predictions, e.g. about the next raven we will see.

   The abstract form of the argument is this:

   (ε_1 through ε_n) α_1 through α_n have all been both φ and θ (i.e., have both characteristics, φ and θ).

               [e.g., Bird A through Bird N all were ravens and black.]

   (ε_{n+1}) There were few observed instances of an α that was φ and also was not-θ

               [e.g. No ravens were observed to be non-black.]

   ───

   Therefore, **h:** Some individual α_{n+1} probably has both φ and θ.

       Some Bird (perhaps some bird we encounter in the future) who is a raven probably is black.

In later discussion, we will use an actual case, *Knapp* v *State*,[18] to illustrate a quite typical use of inductive generalization and inductive specification to resolve an evidentiary argument. It is difficult to overstate the pervasive use of inductive generalization and specification in legal fact finding. It is, as noted, heavily relied on *every time a judge has to decide whether a proffered piece of evidence, ε, is logically relevant to a hypothesis h that might be pertinent to a litigated case* (namely, when in the judge's view—relying on inductive inference—the ε makes h more likely or less likely than h would be without ε[19]; this was at issue in *Knapp*). And, as noted, trial judges must make that judgement about logical relevance for every piece of proffered evidence, in order to decide whether it is admissible (presented to the jury). Inductive inference is also central any time a factfinder—judge or jury—has to decide whether a 'burden of persuasion' has been carried ('beyond a reasonable doubt' in the American criminal law setting, 'preponderance of the evidence' in the American civil law setting). Inductive inference operates as well in ways that perhaps do not come so readily to mind, but which are on quick reflection rather obviously pervasive.[20]

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[18] See the discussion below, page 52 and following.
[19] See the discussion of logical relevance, page 45.
[20] See, e.g., the text of the Advisory Committee Note to Federal Rule of Evidence 201, quoted in the text at note 12.

3.8 *The basic structure of defeasible evidence arguments*

In effect, every time a plaintiff (or prosecutor) brings a new legal case to court, the plaintiff is in effect making the following claim about what the plaintiff can prove, and what the legal significance of that proof is:

'I can adduce enough evidence (ε_1, ε_2 ...ε_n) to prove a set of facts, $h_1...h_n$, that are "elements" of my contracts claim'.

'I also maintain that there's an "authoritative legal rule" in this jurisdiction that says, that when facts $h_1...h_n$ are proven—by adequate evidence (ε_1, $\varepsilon_2...\varepsilon_n$)—to be the case, then specific legal consequences (call the statement of what those consequences are "c") follow from $h_1...h_n$'.

Relying on this claim about the rule and what the plaintiff can prove, the plaintiff then constructs a legal argument that has this structure:

(Premise 1) All (relevant) instances of facts $h_1...h_n$ get legal consequence c

[schematically: *If ($h_1 ... h_n$) then c*]

(Premise 2) For any set of propositions $h_1...h_n$, if there is adequate evidence to prove $h_1...h_n$, then $h_1...h_n$ are each true.

(Premise 3) There is adequate evidence (ε_1, $\varepsilon_2...\varepsilon_n$) to prove $h_1...h_n$

(Premise 4) $h_1 ... h_n$ are each true

(Conclusion) I'm entitled to legal consequence c

3.9 *Legal procedures relevant to understanding defeasiary modes of representing evidential arguments: three 'burdens'*

To bring the case to court and have it fully adjudicated by the court (again, I focus on American law, and this is true at both the state and federal levels) a party must satisfy three burdens: a burden of *pleading* (principally the doctrinal domain of civil or criminal procedure), a burden of *production* (principally the doctrinal domain of the law of evidence), and a burden or *persuasion* (also principally the doctrinal domain of the law of evidence).

3.9.1 *Burden of pleading*.   A party in a dispute, whether plaintiff or defendant, is required to *plead* certain specific 'elements' of a claim, counter-claim or affirmative defence or charge that the law also requires that party to *prove*.

In a civil case, this burden of pleading is minimal under so-called 'notice pleading', which liberally allows amendment of pleadings if a party fails initially to plead an element that the law requires him to plead to initiate his claim, counter-claim or defence. That is, compared to the burdens of production and persuasion, this is the easiest burden to carry. For example, although there is much

variation among jurisdictions on these requirements, a typical jurisdiction requires the plaintiff initiating a contracts claim to plead:

h_1 there was an agreement

h_2 there was consideration

h_3 there was performance by plaintiff

h_4 there was breach by defendant

h_5 there were resulting damages to the plaintiff

The risk a plaintiff typically runs if she *fails* to carry her burden of pleading is that the judge will grant, in favour of defendant, a motion to dismiss for failure to state a claim or a motion for judgement on the pleadings. But because of the liberal allowance of amendments in notice pleading, such motions are unlikely to be granted.

There are (among others) two important ways by which a defendant to a contracts action can plead in response to an adequately pleaded contract 'claim'. One is to file with the court a 'counter claim' in which the defendant pleads a *denial* of one or more of the elements necessary to constitute the plaintiff's contracts *claim*—e.g. the defendant might plead that there was no consideration or that the plaintiff did not perform. Another is to plead an 'affirmative defence', which is basically a claim to the effect that even if the plaintiff is correct in claiming that (on the list above) elements h_1 through h_5 are true, there is a compelling reason to reject the claim that the defendant is liable in contract to the plaintiff. There is a great deal of variation among jurisdictions about what must be plead as an 'affirmative defence', but some typical examples include the following:

h_7 unconscionability

h_8 mistake

h_9 fraud

h_{10} duress

—and many others. (In criminal law, an example of an affirmative defence to a charge of murder is self-defence.)

To satisfy the 'burden of pleading' a plaintiff or defendant merely has to plead these elements of the claim, counter-claim or defence according to rules of pleading and procedure. But satisfying (carrying) that party's burden of production and burden of persuasion requires significantly more; those burdens require the party who would carry them to provide *evidence*.

3.9.2 *Burden of production.*   The party with the 'burden of production' has the burden of providing *sufficient evidence (in the judgement of the trial judge) to permit a reasonable jury (or trier of fact) to decide in that party's favour on a particular element of a claim, counter-claim or defence.* Thus, we may think of each of the elements noted above, whether in the claim by the contracts plaintiff or the counter-claim or affirmative defence of the defendant, as an 'hypothesis' ('h') for which the party who bears the burden of production must provide evidence ('ε'). (Please note that the numbering, 'h_1 , $h_2\ldots h_{10}$' is offered only to distinguish the elements in a plaintiff's claim or a defendant's affirmative defence; there is no other significance to the cardinal numbering '$1, 2, \ldots 10 \ldots$'.) To provide evidence for an element (h_1 , $h_2 \ldots$) is to attempt to carry the burden of production as to that

element. As noted, in a typical contracts case, the plaintiff would bear the burden of pleading and production for each element, h_1 through h_5, above. The defendant would bear the burden of pleading and production for each element h_7, h_8, h_9, or h_{10}—if any of those happens to be a defence offered in the given case.

For example, to satisfy the burden of production on element h_1, the plaintiff might simply proffer to the judge a copy of the (alleged) agreement (if the agreement was put in writing). In the 'ε' and 'h' schema introduced above, the *evidence* ε would be

ε: copy of agreement

offered to establish the *hypothesis* h

h_1 there was an agreement

But if the plaintiff's claim is that h_1 is true by virtue of an oral, not written agreement (although many contracts are written, oral contracts are also permitted in some circumstances), the plaintiff might proffer to the judge his own testimony or that of other witnesses to the oral agreement. In such a case the evidence, ε, might be

ε: testimony (by plaintiff or by others, or both)

offered to establish the hypothesis

h_1 there was an agreement

Rules of evidence determine when a trial judge should deem evidence to be 'sufficient', and thereby to allow the proponent of the evidence to carry her burden of production. In a contracts case (and any civil case), the risk a party runs for not carrying a burden of production that has been assigned to that party is the risk of having the judge direct a verdict against him.

3.9.3   *Burden of persuasion.*   The party who bears the burden of persuasion must persuade the trier of fact, under the applicable standard of persuasion, that the 'burdened' party's evidence and the hypotheses that evidence is used to establish (e.g. testimony as evidence offered to establish the hypothesis that there was an agreement—in the terminology introduced above, the evidence ε_1, ε_2, etc., offered to prove various elements h_1, h_2, etc.) is the most likely version of the disputed events. In the vast majority of contracts cases, the standard of persuasion is 'preponderance of the evidence' (whereas in the criminal setting the standard is 'beyond a reasonable doubt').

3.10   *Logocratic analysis of materiality and relevance*

The concepts of *materiality* and *logical relevance* are central to evidentiary procedures in American law. Under the *Federal Rules of Evidence* (adopted or closely tracked in many states as well), the centrality of rules for materiality and logical relevance is indicated by two rules that, taken together, guide the *admissibility* of evidence—the judgement that the factfinder (trial judge or jury) may consider the evidence.

RULE 401. DEFINITION OF 'RELEVANT EVIDENCE'

'Relevant evidence' means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action[21] more probable or less probable than it would be without the evidence.

RULE 402. RELEVANT EVIDENCE GENERALLY ADMISSIBLE; IRRELEVANT EVIDENCE INADMISSIBLE

All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by other rules prescribed by the Supreme Court pursuant to statutory authority. Evidence which is not relevant is not admissible.

In our logocratic structure, together these rules articulate the following rule for admissibility:

Evidence ε is admissible to prove h if and only if ε is logically relevant to h and ε is material to h[22] and ε offered for h is not excluded by the U.S. Constitution and ε offered for h is not excluded by an act of Congress and ε offered for is not excluded by a rule prescribed by the Supreme Court pursuant to statutory authority.[23]

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[21] In Federal Rule of Evidence 401, the phrase 'of consequence to the determination of the action' is used to refer to what in common law is referred to as materiality.

[22] Regarding the treating of materiality in the Federal Rules of Evidence, see note 21 and accompanying text.

[23] From a formal logical point of view, we can represent these rules as follows, in language of first-order predicate logic, using the following predicate names:

A: ε is admissible to prove h
L: ε is logically relevant to h
M: ε is material to h
C: ε offered for h is excluded by the U.S. Constitution
N: ε offered for h is excluded by an act of Congress
R: ε offered for is excluded by a rule prescribed by the Supreme Court
pursuant to statutory authority

Rule 1: (x) ((Lx & Mx & ~Cx & ~Nx & ~Rx) = Ax)
Rule 1 is logically equivalent to Rule 2:
Rule 2: (x) (~Ax = (~Lx v ~Mx v Cx v Nx v Rx))
In non-formal terms, Rule 1 says:
Evidence ε is admissible to prove h if and only if

ε is logically relevant to h

[and

ε is material to h]

and

ε offered for h is not excluded by the U.S. Constitution

and

ε offered for h is not excluded by an act of Congress

and

ε offered for is not excluded by a rule prescribed by the Supreme Court pursuant to statutory authority

Less formally, Federal Rules of Evidence 401 and 402 specify that no evidence that is not logically relevant or not material is admissible, and all evidence that is logically relevant and material is admissible unless it is excluded by some rule in an Act of Congress, in the Constitution or in some other rule of evidence.

Thus logical relevance and materiality are central foundational criteria for admissibility, and for the logocratic analysis of evidentiary arguments, we will do well to give a precise account of those concepts with some illustrative examples.

Let us begin with two rules, one for *materiality* and one for the *chain of materiality*.

> **Materiality**: Evidence ε is *material* to a litigation L just in case (a) *there exists* [in the trial judge's opinion] some h that is an element in a claim, charge, or defence in L, and (b) that ε is [in the trial judge's opinion] logically relevant to that h.

> **Chain of materiality**: An evidentiary proposition ε is material to a given litigated case if and only if ε is material to some proposition h that is an element in a claim, charge, or defence in that case.

Consider a hypothetical example. Someone has killed Smith. A prosecutor has charged Jones with that killing, alleging that Jones is guilty of 'first-degree intentional homicide', which in this jurisdiction is defined as 'an act committed by any person causing the death of another person with the intent to kill that person or another person'. In the course of Jones' trial, the prosecutor offers testimony from a witness that:

ε_1:   Jones came to believe that Smith had had a 10-year long affair with Jones' wife.

The prosecutor also makes clear to the judge that she's offering ε_1 as evidence of h_1, and she also maintains that h_1 in turn serves as evidence, ε_2, for h_2:

h_1/ε_2:   Jones has a motive to kill Smith.

[Note about the terminology here: because h_1 is the *hypothesis relative to* ε_1 and is also the *evidence relative to* h_2 we label this step in the proof 'h_1/ε_2'.]

h_2:   Jones is guilty of first-degree intentional homicide in the killing of Smith.

As suggested by the definition of 'intentional homicide' in this jurisdiction, motive is not itself a specific *element* of that crime. Is ε_1 nevertheless *material* in this case? Yes, because h_2 clearly is an element of the charge and there is a chain of inference from ε_1 to h_2 in which h_1 is an intermediate link in the chain that serves both as the hypothesis for ε_1 (i.e. ε_1 is offered to prove h_1) and in turn as evidence for h_2. Thus, ε_1 is material because there is a chain of inference from ε_1 to an element in the charge of intentional homicide—that chain of inference is the 'chain of materiality'.

Next let's offer another two rules, one for *logical relevance* and one for the *chain of logical relevance*.

> **Logical relevance**: Evidence ε is *logically relevant* to hypothesis h if and only if ε has [in the trial judge's opinion] any tendency to make h more probable or less probable than h would be without ε.

> **Chain of logical relevance**: An evidentiary proposition ε is logically relevant to a hypothesis h_n if and only if ε is logically relevant to some proposition h_{n-1} and h_{n-1} is itself logically relevant to h_n.

The influential American evidence jurist Edmund Morgan offers a superb illustration of a chain of logical relevance.[24] In Morgan's example, we assume that X has been murdered and the prosecutor proffers the following evidence (ε'):

ε: X wrote a love letter to Y's wife

—in order to support the prosecution's contention that

h: X murdered Y

The issue in the example is whether proposition ε is *logically relevant* to the hypothesis, h, for which it is proffered by the prosecutor in a trial of X for Y's murder. In the American federal system, the judge's decision regarding the logical relevance of this ε for this h would be governed by Federal Rules of Evidence 401 (quoted above), of which every American state has a close counterpart, if not actually the same rule adopted into state law. Morgan shows how a judge must 'unpack' the evidentiary enthymeme $\varepsilon - h$ into a fuller representation of its argument in order to evaluate the claim that ε is logically relevant to h. Morgan speculated about a chain of logical relevance that a judge might construct from ε_1 (*X wrote a love letter to Y's wife.*) to h_6 (*X murdered Y.*), as follows:

1. (ε_1) **X wrote a love letter to Y's wife.**

2. (h_1/ε_2) X loved Y's wife.

3. (h_2/ε_3) X desired Y's wife for X alone.

4. (h_3/ε_4) X desired to get rid of Y.

5. (h_4/ε_5) X planned to get rid of Y.

6. (h_5/ε_6) X carried out the plan to get rid of Y by killing Y without justification.

7. (h_6) **X murdered Y.**

Notice how the chain of evidence–hypothesis–evidence–hypothesis works here. Each of the propositions (2) through (6) does 'double duty' as the hypothesis of evidence that came before it and, in turn, evidence for a hypothesis that comes later in the chain. To reflect that double duty, we label each of those propositions in the chain by both 'ε' and 'h', in ascending numerical order. Thus, ε_1 is evidence for h_1. h_1 is both a hypothesis for ε_1 and evidence for hypothesis h_2, which in turn serves as evidence for h_3, etc. Note also that each of the propositions (1) through (6) in the chain of inferences is a link in the chain to h_6, which is the 'ultimate fact' in this case, i.e. the element in the criminal charge that makes each of those six propositions *material*.

There is another important part of Morgan's analysis, namely, his discussion of *how a judge would typically reason to move along the chain of inferences from ε_1 to h_7*. In logocratic terms, Morgan claims that 'each of the five inference steps he identifies' (from (1) to (2), from (2) to (3), from (3) to (4), from (4) to (5) and from (5) to (6)) is an enthymeme, an argument with one or more

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[24] The example is in E. Morgan, **Basic Problems of Evidence** 185–88 (1961).

steps that are only implicit and can be 'unpacked'. The result of this unpacking is a *chain of logical relevance*.

Morgan speculates about how a judge might perform this unpacking in order to assess the logical relevance of ε_1 to h_7, and suggests the following.

Enthymeme (i)

Premise 1 (ε_1):   X wrote a love letter to Y's wife.

Premise 2 (ε_{1a}):   A man who writes a love letter to a woman is probably in love with her.

Notes:

   (a) The judge supplies the generalization articulated in each of the second premises in these enthymemata, based on the judge's experience (and whatever she uses to inform herself).[25]

   (b) Each Premise 2 is a 'missing' premise; it is because there is a 'missing' premise in the move from Premise 1 to the Conclusion that this is an 'enthymeme' to be 'unpacked' by the judge.

   (c) These second premises also function as evidentiary propositions, so that, e.g. the judge takes ε_1 and ε_{1a} *together* to provide evidence for h_1.

   (d) The specific type of reasoning process the judge relies on to generate the second premise in each of these enthymemata is or relies heavily on *induction*.[26]

Conclusion: (h_1/ε_2) X loved Y's wife.

Enthymeme (ii)

Premise 1 (h_1/ε_2):   X loved Y's wife.

Premise 2 (ε_{2a}):   A man who loves a woman will probably desire her for himself alone.

Conclusion (h_2/ε_3):   X desired exclusive 'possession' of Y's wife.

Enthymeme (iii)

Premise 1 (h_2/ε_3):   X desired Y's wife for X alone.

Premise 2 (ε_{3a}):   A man who loves a married woman and who desires her for himself alone will desire to get rid of her husband.

Conclusion (h_3/ε_4):   X desired to get rid of Y.

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[25] See supra, note 11 and accompanying text.

[26] Abduction is also involved when a judge seeks to determine whether some proffered evidence ε is logically relevant to some hypothesis h.

Enthymeme (iv)

Premise 1 (h_3/ε_4):   X desired to get rid of Y.

Premise 2 (ε_{4a}):   A man who desires to get rid of the husband of the woman he loves probably plans to do so.

Conclusion (h_4/ε_5):   X planned to get rid of Y.

Enthymeme (v)

Premise 1 (h_4/ε_5):   X planned to get rid of Y.

Premise 2 (ε_{5a}):   A man who plans to get rid of the husband of the woman he loves is probably the man who killed him.

Conclusion (h_5/ε_6):   X carried out the plan to get rid of Y by killing Y without justification.

The rule of substantive criminal law, 'All unjustified killing is murder' allows the inference from (h_5/ε_6) to h_6:

h_6:   X murdered Y.

As Morgan explained, the evidentiary inferences from ε_1 (Proposition (1)) to h_6 by no means fully establishes the conclusion. Very often such inferences do not establish the conclusion by either preponderance of the evidence or beyond a reasonable doubt. But for the specific issue of determining *logical relevance*, the kinds of speculation Morgan reconstructs in the mind of his imagined judge is all the law of evidence requires. And note that the 'source' for the judge's unpacking of what he regards as a plausible chain of inferences from ε_1 to h_6 is 'logic and general experience'.[27]

Using logocratic terminology, we may make these observations about Morgan's example. The underlying evidential claim is the prosecutor's claim that ε_1 provides rational support for h_1/ε_2. The prosecutor's argument, which is implicit in his proffer to the judge of ε_1, is an evidentiary enthymeme. We can—and judges and lawyers constantly do—interpret these evidentiary enthymemes into fuller representations of the argument.[28] Most often this interpretation is not written out formally. It is done on the fly, in the hustle and bustle of the trial litigation process. But it is possible in principle to write it out formally. When the argument is 'unpacked' we are in a position to make a judgement (also an interpretive judgement) about the logical form of the unpacked argument. Is it deductive? Is it inductive? This is important because different forms of argument have different kinds

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[27] See J. Thayer, *A Preliminary Treatise on Evidence at the Common Law* 265 (1898). Regarding the source for a judge's 'unpacking' of an evidentiary enthymeme, see sources cited supra, note 11 and accompanying text.

[28] Consider Justice Souter's reference to this chain of inferences in the highly influential *Old Chief* case, which established a test for 'pragmatic' relevance and explained the difference between pragmatic and logical relevance:

> [T]he fact that Old Chief's prior conviction was for assault resulting in serious bodily injury rather than, say, for theft was not itself an ultimate fact, as if the statute had specifically required proof of injurious assault. But its demonstration was a step on one evidentiary route to the ultimate fact since it served to place Old Chief within a particular subclass of offenders for whom firearms possession is outlawed by § 922(g)(1). A documentary record of the conviction for that named offence was thus relevant evidence in making Old Chief's § 922(g)(1) status more probable than it would have been without the evidence.

Johnny Lynn Old Chief v. United States, 519 U.S. 172, 178–179 (1997).

of strengths and weaknesses. The charge that an inductive argument does not 'prove' its conclusion to a certainty is likely to be a misguided argument because inductive arguments can *never* prove the conclusion to a certainty on the basis of the premises. The proper challenge to make to an inductive argument is that it does not prove the conclusion to a sufficient degree of probability to be persuasive.

3.11 *Some utilities of the logocratic method for analysing legal evidentiary arguments*

Unpacking an evidentiary claim into its proper argument form (deductive, inductive, abductive or analogical) can help a lawyer or judge perform several tasks that are central to the law of evidence, including:

  (i) evaluating a claim that a proffer of evidence (an ε) for a particular hypothesis (an h) is logically relevant to that hypothesis.
  (ii) evaluating a claim that a proffer of evidence (an ε) for a particular hypothesis (an h) is material to a given litigation.
  (iii) evaluating the sufficiency of evidence ε offered for a particular hypothesis h
  (iv) weighing a proffer of evidence ε offered for a particular hypothesis h

4. Unpacking the enthymeme in *Knapp* v. *State*

I conclude with a detailed logocratic unpacking of the case *Knapp* v *State*,[29] which will allow us to illustrate many of the foregoing concepts and methods. In *Knapp*, the defendant was charged with murder for the killing of a marshal (law enforcement officer). Knapp claimed that he killed the marshal in self-defence. To support that argument, he claimed that he had heard that the marshal 'had clubbed and seriously injured an old man in arresting him, and that he died a short time afterwards'.[30] The prosecutor introduced testimony by a doctor that the 'old man' in question had died from senility and alcoholism, and that there were no signs of a beating on his body.

At this stage of the litigation, the prosecution would have carried its burden of pleading the murder charge and the defendant Knapp would have borne his burden of pleading self-defence as an affirmative defence. Thus, the trial had moved into the stage at which the parties had to carry their respective burdens of production—demonstrating to the trial judge that evidence was admissible (necessary conditions for which are that evidentiary proposition ε_n offered for h_n was both logically relevant and material) and, if so, that the proponent of each piece of admissible evidence ε_n offered for h_n could adduce sufficient evidence to allow a reasonable factfinder to conclude that h_n was established by ε_n.[31]

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[29] 79 NE 1076 (Supreme Court of Indiana, 1907).

[30] '[Knapp, the defendant] appeals from a judgement in the above-entitled cause, under which he stands convicted of murder in the first degree. Error is assigned on the overruling of a motion for new trial. Appellant, as a witness in his own behalf, offered testimony tending to show a killing in self-defence. He afterwards testified, presumably for the purpose of showing that he had reason to fear the deceased, that before the killing he had heard that the deceased, who was the marshal of Hagerstown, had clubbed and seriously injured an old man in arresting him, and that he died a short time afterwards. On appellant being asked, on cross-examination, who told him this, he answered: "Some people around Hagerstown there. I can't say as to who it was now." The state was permitted, on rebuttal, to prove by a physician, over the objection and exception of the defence, that the old man died of senility and alcoholism, and that there were no bruises or marks on his person. Counsel for appellant contend that it was error to admit this testimony; that the question was as to whether he had, in fact, heard the story, and not as to its truth or falsity'. *Knapp*, 79 N.E. at 1077 (1907).

[31] See the discussion of the burdens of pleading and production in the text above starting at page 36.

The specific legal issue in *Knapp* was whether the prosecutor's evidence (a doctor's testimony of how an old man had died) was logically relevant to the defendant's claim of self-defence under the state's evidence law rule for logical relevance.[32] That is, in slightly more schematic terms, was the following evidence (we will label it 'ε') logically relevant to the hypothesis (we will label it 'h') for which the prosecution offered the evidence? If the doctor's testimony in ε was true, did it make it either more likely or less likely that the defendant acted in self-defence (because he feared for his life because of what he had heard about how the old man died)?

ε: Witness doctor testimony: the old man died of alcoholism and senility

(not of a beating)

h: the defendant acted in self-defence because he feared for his life

The judge's analysis of this issue is enthymematic. As I shall try to show, when his enthymeme is unpacked into a fair formal representation, we will see that in order to decide whether ε was logically relevant to h, the judge relied on an *inductive generalization about truth telling* to help him determine whether the truth of ε would make h more or less likely than if ε were false, and then on an *inductive specification* to apply the generalization to the defendant's challenge to the admissibility (specifically, to the logical relevance) of the prosecutor's proffered testimony. As we shall also see, the kind of inference the judge constructed for this purpose is *defeasible*, so we need a *defeasiary mode of representation* adequately to represent his argument.[33] Note also that inductive arguments are arguments about evidence and the hypotheses the evidence is said to support. Thus, the premises of an inductive argument are evidentiary propositions (the 'ε' in our ε−h schema) and the conclusion is a hypothesis that the evidence is offered to support the 'h' in our ε− h schema.

Here is the inductive principle the judge states in *Knapp*:

> **[Truth-speaking principle]**: One of the first principles of human nature is the impulse to speak the truth. "This principle," says Dr. Reid, whom Professor Greenleaf quotes at length in his work on Evidence (volume 1, Sec. 7n), "has a powerful operation, even in the greatest liars, for where they lie once they speak truth 100 times." Truth speaking preponderating, it follows that to show that there was no basis in fact for the statement appellant claims to have heard had a tendency to make it less probable that his testimony on this point was true. [*Knapp* v. *State* (79 N.E. 1077)]

The judge concluded that, when the truth-speaking principle was recognized as true, then ε did indeed affect the probability of h (in his view it made h *less* likely). The following schematization will suggest how *Knapp* judge's discernment and application of the 'truth-speaking principle' relied on inductive inference.[34]

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[32] See the discussion of logical relevance starting on page 45. Although *Knapp* was not a federal case (it was in the state of Indiana), it had a requirement of logical relevance very similar to the rule in Federal Rule of Evidence 401. Restating the rule to bring out its logical structure, the rule actually governing *Knapp* was something like this: If there is an 'open and visible connection between the fact under inquiry [whether Knapp killed the marshal in self-defence] and the evidence by which it is sought to be established [doctor's testimony that the old man died of alcoholism and senility and not from a beating], then the evidence is logically relevant'.

[33] See the discussion of defeasibility and the defeasiary mode of representation in the text above beginning on page 23.

[34] I use the same schema presented above, see text starting on page 30.

ε_1:   Person 1 made a factual assertion and Person 1 spoke truly.
ε_2:   Person 2 made a factual assertion and Person 2 spoke truly.
ε_3:   Person 3 made a factual assertion and Person 3 spoke truly.

ε_n: Person n made a factual assertion and Person n spoke truly.

ε_{n+1}:   There were few persons who made a factual assertion and did *not* speak truly—*Knapp*: 'even in the greatest liars,... where they lie once they speak truth 100 times'.]

∴ h: *Knapp*: Probably, most persons who make factual assertions are persons who speak truly.

Now, there is much to ponder in the judge's reasoning here. Did he adequately distinguish uttering a *falsehood* from uttering a *lie*? If that distinction is properly made, it would seem to affect the plausibility of his inductive about truth-telling quite substantially, for surely a massive percentage of spoken utterances, in the history of spoken utterances, are false but believed (think of all the bad science, or think about all the utterances of religions that are inconsistent and thus cannot all be true).[35] Also, there is some logical tension in this inductively inferred rule: it is 99% likely that Knapp did not hear the false information, and it is 99% likely that he truly reports that he did. (Compare familiar problems with statistical syllogisms.)

Be that as it may, to complete his analysis of logical relevance, the judge had to apply the generalization in his truth-speaking principle specifically to the prosecutor's proffered evidence. To do this he resorted (or so we seem entitled to reconstruct his enthymeme) to inductive specification. The inductive specification is the argument that a great many persons (*Knapp* endorses the claim that the ratio is 100 to 1!) who made factual assertions spoke truly, therefore, some individual person (namely, the people from whom Knapp *claimed* to hear that the marshal had beaten the old man to death[36]) who made a factual assertion are also likely to have spoken truly.

The abstract form of his argument is this:

$(\varepsilon_1 - \varepsilon_n)$: Persons 1 through Person n all made a factual assertion and spoke truly.

ε_{n+1}: There were relatively few Persons who made a factual assertion and did

not speak truly.

Therefore, h: some Person who made a factual assertion probably spoke truly.

[35] Quine and Ullian offer another reason for caution about a 'truth-speaking principle' such as the judge fashioned in *Knapp*:

> Veracity is generally admirable, if not always prudent; but credulity, in more than modest measure, is neither admirable nor prudent.... The courtroom is worthy of the attention of anyone who is inclined toward taking too much of what he is told at face value. It teaches a stern lesson. People disguise the truth in certain situations, whether out of deviousness, self-deception, ignorance, or fear. They also, of course, misremember, misjudge, and misreason.

W. Quine & J. Ullian, The Web of Belief 36–37 (1970). Also, the tight and tangled controls on admission of hearsay evidence also suggest great wariness regarding the accuracy of statements made by out-of-court declarants, who are liable to the four 'testimonial infirmities'. See the class article by Laurence Tribe, Tribe, *Triangulating Hearsay* 87 Harv. L. Rev. 957 (1974).

[36] 'On appellant [Knapp] being asked, on cross-examination, who told him this, he answered: "Some people around Hagerstown there. I can't say as to who it was now"'. *Knapp*, 79 N.E. at 1077 (1907).

5. Conclusion

In this essay, I have sought to provide a basic framework of concepts and methods of analysis that can enable the analyst to assess the strengths and weakness of the arguments offered, explicitly or implicitly, in litigation to show that evidence supports hypothesis. Plato's Socrates, the patron saint of philosophy, declared several millennia ago, 'the unexamined life is not worth living'.[37] In any legal system that aspires to have a fact-finding process that is sufficiently reliable to meet the requirements of justice, we might fashion an analogue for the Socratic maxim: the unexamined evidentiary argument is not worth believing. The logocratic method seeks to help the evidence analyst pursue that Socratic mission, tailored to the rules and institutions of evidence law.

Acknowledgement

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[37] Plato, *Apology* 38A.